

Maritime Training Package – TDM01

The material contained within this volume is part of the Endorsed component of the Training Package.

This volume must be read in conjunction with information contained within the sector specific companion volumes, which are:

- Maritime Training Package – Assessment Guidelines
- Maritime Training Package – Engineering
- Maritime Training Package – Deck Operations Book 1
- Maritime Training Package – Deck Operations Book 2
- Maritime Training Package – Maritime Supplement

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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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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>).

Maritime Training Package –TDM01

Sheet: 1 of 2

Version	Date of Release	Authorisation:	Comments
2	24/11/2003	NTQC	<p>Change to 'Maritime Sector Qualification' to include 'It should also be noted that TDMMF4502A and TDMMF5302A together are an alternative to TDMMF901A'</p> <p>Inclusion of a mapping exercise outlining new units and how they relate to existing units.</p> <p>Additional units to qualifications in: Certificate I in Maritime Operations Certificate II in Maritime Operations Certificate III in Maritime Operations Certificate IV in Maritime Operations Certificate II in Marine Engine Driving Certificate III in Marine Engine Driving Certificate IV in Marine Engineering</p> <p>Amendments to Units: TDMMB101B Perform routine remedial, preventative and survey deck maintenance on a vessel TDMMC701B Apply seamanship skills and techniques when operating a small domestic vessel TDMMC901B Manoeuvre a domestic vessel of less than 12 metres in length operating within shore limits TDMMC1001B Steer a domestic vessel under the direction of the master or officer in charge of the watch TDMME801B Transmit and receive information by GMDSS subsystems and equipment on a vessel TDMMF501B Develop emergency and damage control plans and handle emergency situations on board a vessel TDMMF701B Observe safe working practices and procedures on board a vessel TDMMF801B Comply with emergency procedures on board a vessel TDMMF3201B Apply domestic regulations when operating a small vessel</p> <p>New Units: TDMMF4502A Operate breathing apparatus on board a vessel TDMMF4702A Contribute to maintaining a safe watch on a domestic vessel TDMMF4802A Execute watchkeeping arrangements and procedures on a domestic vessel TDMMF5302A Fight and extinguish fires on board a small vessel TDMMH1102A Use radar to maintain safe navigation TDMMH1202A Plan and navigate a short voyage within inshore limits</p>

			TDMMH1302A Apply weather information when navigating a small domestic vessel TDMMR5402A Carry out refueling and fuel transfer operations TDMMR5502A Perform rigging and lifting operations on board a small domestic vessel TDMMU502A Ensure compliance with environmental considerations in a small domestic vessel
1.00	30/08/2001	NTQC	Primary release

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INTRODUCTION

In 1996, the Ministers of Vocational Education and Training endorsed the major features of a National Training Framework, designed to make the regulation of Australia's national training arrangements simpler and more flexible.

The major features of the National Training Framework are:

- Revised and simplified arrangements for the recognition of training organisations and training products assuring quality of training provision
- Training Packages which integrate nationally available training products including new assessment arrangements with competency standards

Training Packages within the Transport and Distribution Industry have a number of applications. Although primarily used as a resource to develop training programs within the industry, they will also provide a benchmark for the assessment of an individual's competence, and may be used in the evaluation of enterprise quality processes and as a tool for organisational management.

Training Packages integrate nationally recognised and endorsed competency standards, assessment guidelines and qualifications. These are endorsed by the Australian National Training Authority (ANTA) through the National Training Quality Council (NTQC) and hence are known as the endorsed components of the Training Packages. The relationships between the three components may be expressed as:

- Competency Standards specify the level of performance required in the workplace
- Assessment Guidelines provide a framework in which an accurate, reliable and valid assessment of the applicable competency standards may take place
- National Vocational Education and Training (VET) Qualifications are awarded when an individual has been assessed as achieving a combination of competency standards at an appropriate level. Where an individual has achieved less than the combination of competency standards for a qualification to be issued, that individual is given a Statement of Attainment which similarly recognises their achievement. It should be noted that these are VET qualifications and should be distinguished from the certification processes of AMSA and the State/Territory Marine Authorities. This distinction is clarified further in the following section of the Guidelines.

The endorsed components of the Training Package are complemented by the development of optional learning strategies, assessment tools and professional development materials which form the support material components of the training package and hence do not have to be submitted for endorsement but may be noted by the NTQC.

This booklet provides one aspect of the endorsed component of the Training Package - the Assessment Guidelines.

WHAT ARE ASSESSMENT GUIDELINES

Assessment Guidelines describe the type of system by which the competency of an individual may be assessed against endorsed industry/enterprise competency standards for the purpose of issuing a National VET Qualification. They detail information concerning assessment processes and address issues such as:

- How and when assessments may be conducted
- Who may conduct assessments
- What constitutes a valid assessment
- The types of recording and credential issuing mechanisms

The process of assessment is a central element of the development of a Competency Based Training (CBT) system. It ensures that persons working or seeking work within the Transport and Distribution industry have the skills and knowledge required to perform selected job functions. Similarly it provides a benchmark that ensures an individual's skills are recognised and acknowledged.

Assessment Guidelines provide direction for the implementation of an industry relevant assessment system that is designed to ensure the validity, reliability and fairness of assessments conducted in the workplace and in institutional contexts.

Training Package Assessment Guidelines are based on principles agreed by Commonwealth, State and Territory Ministers of Vocational Education and Training. The Guidelines are designed to ensure validity, reliability and fairness of assessments conducted in workplaces and institutional contexts.

The following extract from 'Guidelines for Training Package Developers' (ANTA - 1997,B11) outlines the required format of guidelines for Assessment Guidelines to gain endorsement from the NTQC.

The Assessment Guidelines component of the Training Package comprises five sections.

1. *Assessment System Overview - a description of the assessment system which operates in the specific industry or industry sector*
2. *Assessor Qualifications and Training - an outline of the qualifications required for assessors, the way in which these requirements can be met and the training that is available for assessors*
3. *Guidelines for Designing Assessment Materials - a description of the processes involved in designing assessment materials which enable assessors to gather sufficient, valid and reliable information for making assessment decisions*
4. *Guidelines for Conducting Assessments - an overview of the industry endorsed processes for conducting assessments*
5. *Sources of Information on Assessment - details of sources of information on the industry assessment system*

TRAINING AND REGULATORY REQUIREMENTS IN THE MARITIME INDUSTRY

Training and assessment of individuals for qualifications in the Maritime Sector of the Transport and Distribution Industry is different from many other sectors because of the very tight international, national and State/Territory maritime regulations. These are briefly described in Appendix 2 of these Guidelines. Individuals seeking training and assessment in Maritime Qualifications under the Australian Qualifications Framework (AQF) usually wish to work on a vessel operating in either international waters or in near coastal or inshore contexts. To do so, they must not only possess qualifications under the AQF but must also fulfil the certification requirements of the relevant maritime authority for the maritime occupation concerned. Assessment of competence must therefore comply with the assessment requirements of the relevant maritime regulations. Assessment of units must only be undertaken within relevant marine authority approved and audited arrangements by a Registered Training Organisation. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations. Appropriate practical assessment must occur either at a Registered Training Organisation approved and audited by the relevant marine authority, and/or on an appropriate working or training vessel.

It is therefore important that Registered Training Organisations involved in training and assessment in the Maritime Sector have due regard not only for the competency requirements for qualifications summarised in this Training Package, but also the certification requirements of the Australian Maritime Safety Authority (AMSA) and/or the respective State/Territory Marine Authorities as they relate to the maritime occupation(s) concerned. This has been facilitated by a close mapping and alignment of the competency units in this Training Package and the related competency requirements detailed in the respective maritime regulations and codes (i.e. the IMO STCW 95 Code and Convention; AMSA Marine Orders; the Uniform Shipping Laws Code (under review as at 1 December, 2000) established by the National Maritime Safety Committee (NMSC); and the regulations of the respective State/Territory marine authorities). Given that there is a review in progress of the USL Code, Registered Training Organisations intending to use this Training Package should check with the NMSC and TDT Australia on the status of the Review and any implications of a revised Code for the use of the Training Package.

It is important also that training organisations training and assessing individuals to work in the Maritime Sector are not only registered with the relevant State/Territory Vocational Education and Training Recognition Authority but also fulfil requirements set by the marine authorities for training organisations preparing individuals for certification within the relevant maritime regulations. This includes any requirements for approval and auditing of assessment arrangements.

When training and assessing individuals against qualifications for working on vessels in near coastal or inshore waterways, Registered Training Organisations should be mindful that in the course of career progression persons may seek endorsement of their maritime certificates of proficiency (issued by the relevant marine authority) to enable them to take up a position on a vessel operating in international waters. It is important that due provision is made in training and assessment arrangements to facilitate the achievement of these endorsements. The Australian Marine Safety Authority and the relevant State/Territory marine authority should be contacted to obtain information on the requirements and arrangements for such endorsements.

SECTION 1

OVERVIEW

TDT Australia has coverage for the Transport and Distribution industry which comprises the Road Transport, Warehousing, Stevedoring, Maritime, Rail and Bus Transport, and Air Transport sectors.

All sectors encompassed by TDT Australia have undergone and continue to undergo significant workplace restructuring and change. The implementation of new technology, changes to the organisation of work, increased efficiency and globalisation have substantially impacted upon the competencies required of individuals within the industry.

To meet the challenge of industries continued restructuring, the training system should continue to adapt, change, and provide opportunities whereby individuals' skills and knowledge will remain adaptable to different contexts and environments.

The focus of TDT Australia is to promote and support, through the Assessment Guidelines, the need for assessment to be more attuned to workplace situations. The changes mean that greater attention will be given to direct assessment practices in the workplace environment where the need to infer competence rather than observe it is reduced. In this way, the assessment of an individual's competence is based on realistic workplace outcomes (as detailed in the competency standards) rather than the implementation of training generally isolated from a workplace context.

The benchmark for assessment, in accordance with national requirements, will be the endorsed industry competency standards for Transport and Distribution.

Maritime	AQF Levels 1-6
Road Transport	AQF Levels 1-4
Warehousing	AQF Levels 1-4
Stevedoring	AQF Levels 1-4
Logistics	AQF Levels 4-6

ROLE OF REGISTERED TRAINING ORGANISATIONS

The Commonwealth, State and Territory Ministers that oversee the development of vocational education and training decisions (ANTA Ministerial Council), outline several criteria (appendix 1) to which any industry assessment framework must conform. One of those criteria details the requirement that 'Assessment should be undertaken by, or auspiced through, a registered training organisation. That is, any assessment that leads to a qualification under the AQF, must be overseen by a Registered Training Organisation (RTO).

The industry, under this arrangement, is required to set out processes concerning how and in what circumstances a RTO may operate. In the Transport and Distribution Industry Assessment System the RTOs are responsible for:

- Conducting assessment processes in accordance with industry assessment guidelines and agreed State/Territory Training Authority/Industry QA arrangements
- Ensuring that the relevant industry/enterprise endorsed competency standards are used as the benchmark for assessment
- Ensuring that individuals/partnership arrangements undertaking assessments meet the assessor criteria as stipulated by the industry
- Providing quality assurance mechanisms to ensure that assessment is fair, reliable, valid and provides for a consistency of outcomes
- Ensuring that assessments are conducted in a cost efficient, flexible and timely manner
- Issuing the relevant AQF qualification or statement of attainment to an individual who has been assessed as competent in the prescribed units of competency
- Monitoring and evaluating the application of adherence of the assessment process to ensure it is adhering to the industry Assessment Guidelines
- Maintaining records of all assessments undertaken
- Instituting a reporting process for assessment outcomes
- Providing access to records to authorised personnel in a secure and efficient manner

RANGE OF OPTIONS FOR UNDERTAKING ASSESSMENT

Within the Transport and Distribution Assessment System a range of options are available to enterprises and providers in the undertaking of assessments provided that those arrangements are in accordance with the Assessment Guidelines. It should be noted that the RTO has responsibility for ensuring the integrity of the assessment process and this should be the guiding focus at all times.

The range of options include:

- Partnerships between enterprises and providers whereby aspects such as evidence collection, assessor requirements, validation methods and the like are shared between the organisations
- Enterprises undertaking the assessment process with the RTO monitoring and validating the assessment outcomes
- Enterprises becoming RTOs
- Enterprises engaging RTOs to undertake all assessment requirements
- Combinations of the above

ASSESSMENT PATHWAYS

The assessment pathway outlined advocates that one assessment pathway is to be applied within the assessment model, which will lead to national recognition and a full or part qualification under the AQF.

This is consistent with the Ministerial Council decisions (appendix 1) which outline that 'Assessment processes shall provide for the recognition of current competencies regardless of where these have been acquired' and further, 'Endorsed industry/enterprise standards are the benchmarks for assessment, where they exist'.

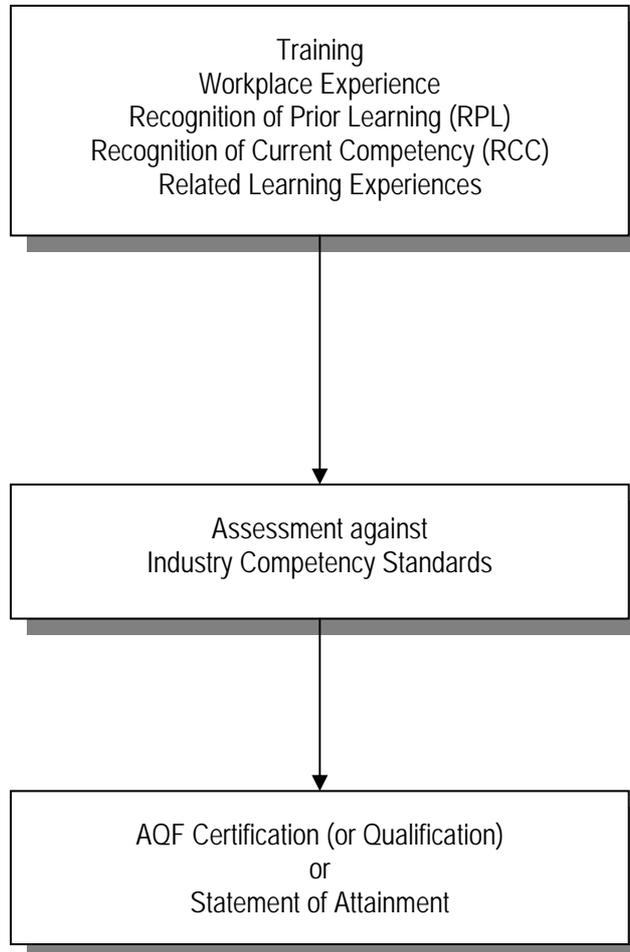
The single assessment pathway acknowledges that competency can be developed through a variety of structured and unstructured experiences, informal and formal training and the transference of knowledge and skill from other contexts and environments. To devise different assessment pathways to encompass the myriad of ways in which competency may be gained is neither efficient nor effective. **The major consideration in any assessment process must be the attainment of the required standard of performance rather than how the competencies may have been acquired.**

The rationale for the single assessment pathway is based on the premise that competency standards provide a benchmark for not only the identification of the required skills and knowledge to be demonstrated but also detail the appropriate context and range of evidence necessary to inform a valid assessment. Therefore, although methodologies and processes for the collection of evidence may differ to account for varying contexts and individual/enterprise requirements, a level of consistency and validity is maintained by ensuring that assessment is always benchmarked against the relevant endorsed industry/enterprise standard.

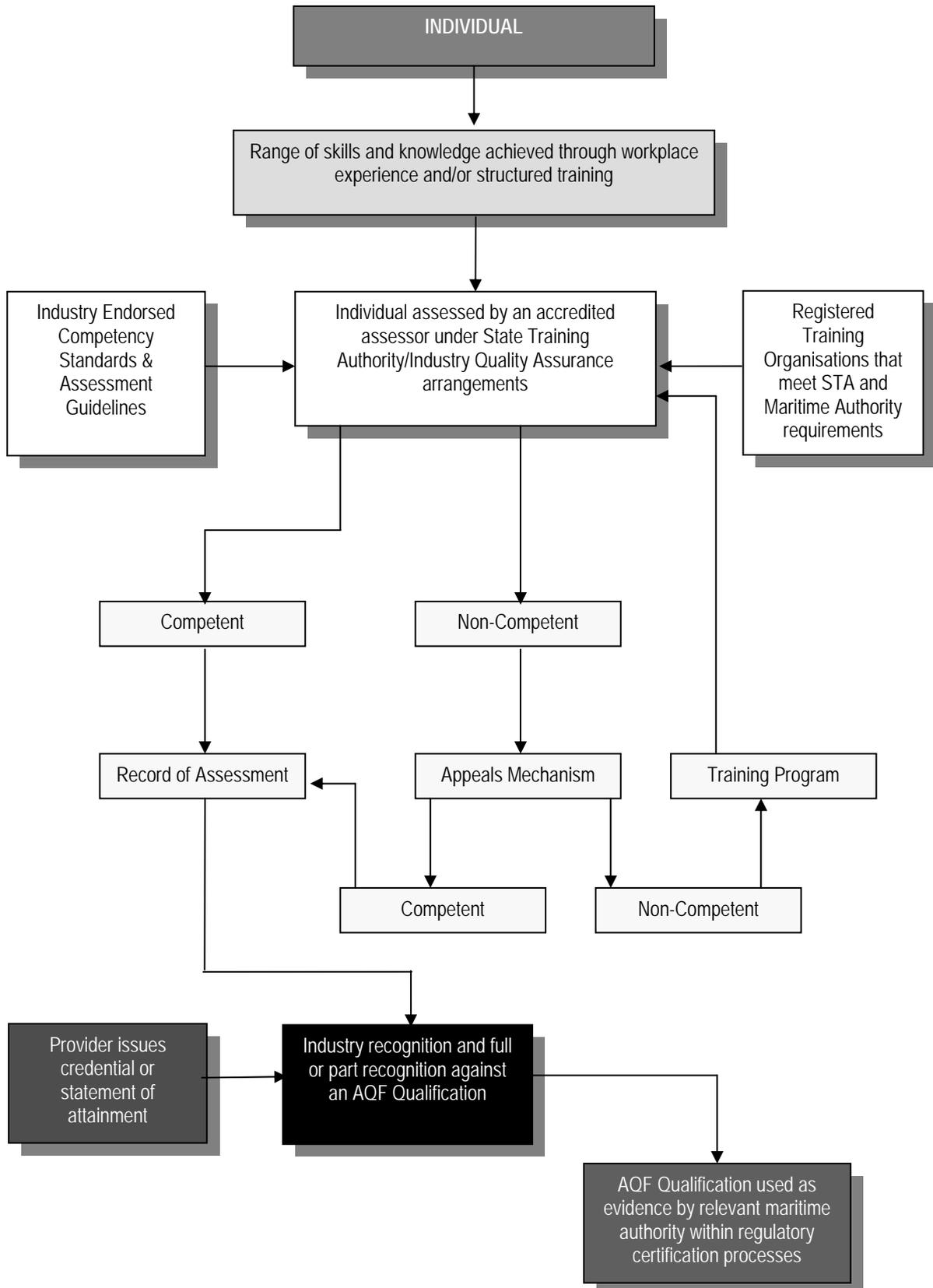
'Assessment is the process of collecting evidence and making judgements on whether competency has been achieved, the purpose of assessment is to confirm that an individual can perform to those standards expected in the workplace as expressed in the relevant endorsed industry/enterprise competency standards'.

Guidelines for Training Package Developers. (1997 - B11).

PATHWAYS TO RECOGNITION (CHART)



ASSESSMENT PATHWAYS (CHART)



ASSESSOR QUALIFICATIONS

Assessments against the competencies in the Training Package will be carried out in accordance with these endorsed guidelines. 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.

Assessors within the Transport and Distribution industry are the principal driver in delivering a responsive, efficient and high quality assessment system. Within the assessment framework they have primary responsibility for:

- determining the application of the assessment process,
- utilising appropriate assessment strategies and instruments,
- conducting the assessment process,
- making accurate and informed judgements, and
- informing and recording all relevant parties of the outcomes of the assessment process.

It is therefore fundamental that assessors must be competent and knowledgeable in the process of assessment.

All assessors, must be competent against two units within the *Competency Standards for Assessment 1995* (Ministerial Council decision – appendix 1).

To be recognised as an assessor in the Transport and Distribution Industry the assessor must:

- be competent against the following units of competency from the *Competency Standards for Assessment*:
 - *Plan assessment*
 - *Conduct assessment*
 - *Review Assessment*
- have knowledge of the nature and impact of training reform within the Transport and Distribution industry including an overview of the process of assessment adopted by the industry.
- be technically competent at least to the level being assessed either individually or in a partnership arrangement.

Assessor competence may be achieved through the completion of a recognised training program or an approved recognition of prior learning process. Regardless of the method used to infer competence, assessment must always be demonstrated against the endorsed industry assessor standards.

USING QUALIFIED ASSESSORS

In undertaking the assessment process consideration must be given to those methods that, whilst maintaining the integrity and quality of the system, offer an approach that is innovative and flexible.

There are a variety of means by which an assessment may be undertaken, these include:

- the structure of the process, including the combinations of persons that may conduct the assessment
- the gathering of evidence, which may include data collection procedures such as previous history, challenge tests, demonstrations, workplace records etc., and
- the various recognition arrangements negotiated between the provider and the enterprise.

These processes can potentially offer significant cost and time efficiencies to both enterprises and individuals.

Significant flexibility may be obtained by using combinations of persons for assessment. This may include utilising operational experts, enterprise endorsed assessors, external assessors, workplace supervisory personnel, assessment panels and the like in various ways provided that their combined competence is equal to the benchmark requirements for a qualified Transport and Distribution assessor.

Whilst some enterprises and Registered Training Organisations will opt for a single qualified assessor to undertake the assessment process, others will utilise a flexible approach when undertaking workplace or institutional assessments. The flexible approach being most appropriate where assessors may not be technically competent at the level or unit being assessed or where it is cost prohibitive to have an assessor undertake all aspects of the assessment process (e.g. remote location, length of assessment etc.).

The assessor, in determining the level of competence or otherwise of a candidate, must be satisfied that the evidence collected adequately addresses the applicable industry/enterprise competency standards and that the assessment process has been undertaken in a valid, reliable and fair manner.

REQUIREMENTS FOR CONDUCTING ASSESSMENTS

The following requirements must be adhered to when conducting assessments:

- assessors (or partnership arrangements) must have a technical level of competence at least to the level to which the assessment is being undertaken.
- partnership arrangements between Registered Training Organisations and enterprises are conducted in accordance with assessment quality processes and reflect the needs of individuals and enterprises.
- assessment process must be undertaken, either in part or in full, by a qualified assessor. Where a combination of persons is deemed the most appropriate method for assessing competence, all quality assurance and assessor requirements must be met.
- the outcome of any assessment process must be endorsed and forwarded for recognition by a qualified assessor.
- Registered Training Organisations must verify and document the competence of individual assessors in accordance with industry requirements.

SECTION 3

THE PROCESS OF ASSESSMENT

The process of assessment within the Transport and Distribution assessment system requires assessors to make informed judgements concerning an individual's performance against national industry or enterprise-based competency standards. To fulfil this requirement there is a constant need for assessors to interpret and translate information contained within the competency standards to meet the varying contexts in which assessment will take place. The development of reliable, valid, flexible and fair assessment instruments are critical in meeting this challenge.

The design of assessment instruments must therefore consider aspects such as the:

- assessment context
- assessment environment
- assessment purpose
- level of available resources
- characteristics of the individual being assessed
- rigour and length of the assessment
- level of evidence required

At all times assessors must ensure that sufficient evidence is gathered to provide an accurate, valid and fair assessment of an individual's performance against the applicable competency standard(s).

EVIDENCE GATHERING

An effective assessment process relies on the collection of sufficient information to make an informed judgement on the performance of an individual. Whilst there are no absolute rules about how much evidence is required or what evidence gathering methods should be used, there is a need to confirm the accuracy and consistency of any assessment of performance.

Although processes for the gathering of evidence will vary, four primary approaches should be utilised.

They include:

- samples of performance (e.g. constructed through simulations, activities and the like);
- observation of performance in the workplace;
- evidence of prior performance (e.g. recognition of prior learning, recognition of current competencies);
- supplementary information (e.g. questioning, tests, presentations, contingency analysis and the like).

In many instances, the most appropriate method of gathering evidence will be a combination of all four approaches although this would need to be considered in relation to factors such as time, cost and context. In the case of the Maritime industry, confirmation of required knowledge is critically important, particularly for marine engineering occupations. As a minimum, required knowledge should be assessed by appropriate written/oral examinations under assessment arrangements approved and audited by the relevant marine authority.

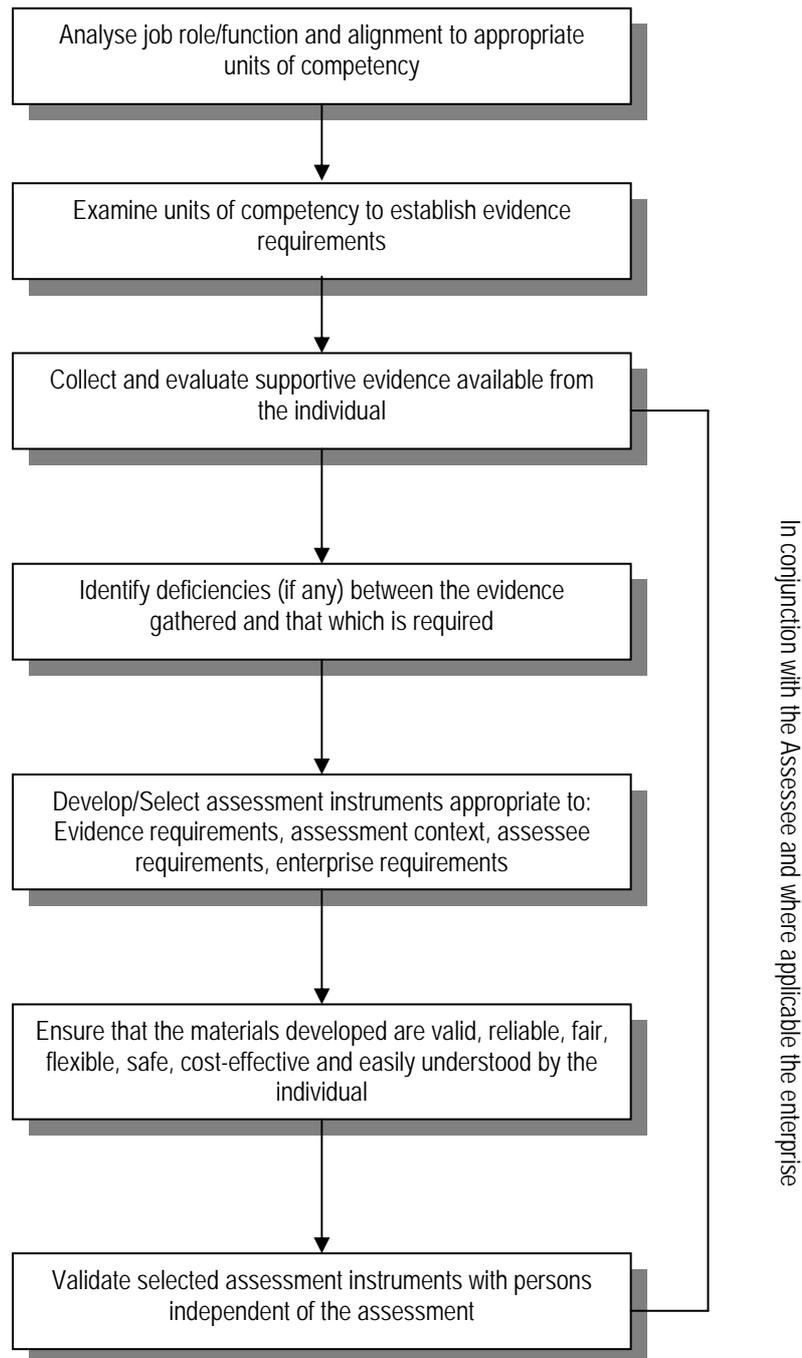
Examples of Appropriate Evidence Gathering Methods or Techniques

1. Assessment of required knowledge	a. Written examinations b. Oral examinations
2. Samples of performance	a. Evaluation of simulated product b. Evaluation of simulated process c. Examination of finished products and processes d. Skill tests aligned to work activity
3. Observation of performance in the workplace	a. Evaluation of product b. Evaluation of process c. Management of changing context and requirements d. Interaction with related work activities
4. Evidence of prior performance	a. Evaluation of qualifications content b. Evaluation of previous work through portfolios, projects, articles, reports, work history, supervisory personnel and referees' reports etc.

ASSESSMENT INSTRUMENT DESIGN

In constructing valid and reliable assessment instruments a balance must be maintained between the specific needs of enterprises and individuals and that of ensuring the integrity of the industry/enterprise competency standards. It is the responsibility of the assessor to ensure that any instruments utilised will produce an outcome that can be directly aligned to the achievement of an industry/enterprise competency standard(s).

The following flowchart outlines a process of designing assessment instruments that meet that criteria.



SECTION 4

GUIDELINES FOR CONDUCTING ASSESSMENTS

The following guidelines are based on three major stages of the assessment process:

1. Prepare for assessment
2. Conduct the assessment
3. Manage and review the assessment process

The guidelines are applicable to any assessment context using industry or enterprise competency standards.

It is viewed that the assessor and assessee are active participants in the assessment process. Where the assessment is undertaken in a workplace, the opportunity to participate in the assessment process should be afforded to the employer and other relevant persons.

PREPARE FOR ASSESSMENT

1. Identify and explain the context of assessment	<ol style="list-style-type: none">a. Discuss the context and purpose of assessment with the person(s) being assessed and confirm that it is understoodb. Obtain and explain to the person(s) being assessed the relevant performance measures applying to assessment (e.g. current endorsed competency standards, learning outcomes of the training program)c. Explain and obtain agreement for the assessment procedured. Identify and explain any legal and ethical responsibilities associated with assessment to the person(s) being assessede. Check whether the person(s) being assessed requires special needs
2. Plan evidence gathering opportunities	<ol style="list-style-type: none">a. Identify opportunities to gather evidence of competency which occur as part of the workplace or training activitiesb. Identify the need to gather additional evidence which may not occur as part of workplace or training activitiesc. Plan and schedule all evidence gathering activity in accordance with the assessment procedured. Ensure that the planned approach to gathering evidence will provide sufficient, reliable, valid and fair evidence of competencye. Ensure that the planned approach to gathering evidence will cover the four dimensions of competence<ol style="list-style-type: none">e.1. Task skillse.2. Task management skillse.3. Contingency management skillse.4. Job/role environment skills
3. Organise assessment	<ol style="list-style-type: none">a. Obtain and arrange the resources specified in the assessment procedureb. Inform the relevant people of assessment plansc. Check that the assessment environment permits fair, valid and reliable assessmentd. Check that the assessment environment is safe and accessiblee. Explain the assessment arrangements and requirements simply and clearly to the person(s) being assessedf. Obtain agreement regarding assessment arrangements with person(s) being assessed

CONDUCT THE ASSESSMENT

1. Gather evidence	<ul style="list-style-type: none"> a. Put the person(s) being assessed at ease b. Gather all the evidence specified in the assessment procedure, using assessment methods and tools specified c. Gather evidence for those with special needs, in accordance with specified allowable adjustments to the assessment method(s) d. Document the evidence gathered in accordance with the assessment procedure
2. Make the assessment decision	<ul style="list-style-type: none"> a. Evaluate the evidence gathered in terms of its: <ul style="list-style-type: none"> a.1. Validity a.2. Authenticity a.3. Sufficiency a.4. Currency a.5. consistent achievement of the specified standard b. Make the assessment decision in accordance with the criteria specified in the assessment procedure c. Seek guidance, if in doubt, from a more experienced assessor(s) nominated in the assessment procedures

MANAGE THE ASSESSMENT SYSTEM

1. Record assessment results	<ul style="list-style-type: none"> a. Record assessment results promptly and in accordance with the specified assessment procedure b. Record assessment results accurately in accordance with the specified record keeping requirements c. Provide access to the assessment records only to authorised personnel d. Maintain confidentiality of assessment outcome
2. Provide feedback to person(s) being assessed	<ul style="list-style-type: none"> a. Discuss and confirm performance with the person(s) being assessed b. Give clear and constructive feedback to the person(s) being assessed c. Explore with the person(s) being assessed ways of overcoming any gaps in their competency revealed by assessment d. Give guidance on further goals/training opportunities, if appropriate e. Advise and confirm with person(s) being assessed reassessment opportunities and/or review appeal mechanisms available where the assessment decision is challenged
3. Report on the conduct of the assessment	<ul style="list-style-type: none"> a. Report on the positive and negative features experienced in conducting assessment responsible for the assessment procedure b. Record and report promptly any assessment decision disputed by the person(s) being assessed to those nominated in the assessment procedure c. Make suggestions for improving any aspect of the assessment process to those responsible for the assessment procedure

SECTION 5

SOURCES OF INFORMATION ON ASSESSMENT

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APPENDIX 1

ASSESSMENT PRINCIPLES ADOPTED BY VOCATIONAL EDUCATION AND TRAINING MINISTERS

1. Endorsed industry/enterprise standards form the basis of qualifications in the vocational education and training sector, where they exist.
2. Endorsed industry/enterprise standards are the benchmarks for assessment, where they exist.
3. Assessment conducted for the purpose of national recognition should lead to a part or full qualification under the Australian Qualifications Framework (AQF)
4. Assessment should be undertaken by, or auspiced through, a registered provider.
5. Assessment for national recognition purposes shall be conducted within a quality assurance framework.
6. Responsibility for assessment resides with the body that issues the qualification under the Australian Qualifications Framework.
7. Assessment processes shall be valid, flexible and fair.
8. Assessment systems must incorporate mechanisms for recording, storing and accessing outcomes.
9. Assessment reporting systems should indicate the units of competency that the individual has attained.
10. Assessment systems should incorporate ongoing monitoring and review processes.
11. Assessment processes shall provide for the recognition of current competencies regardless of where those have been acquired.

REGULATORY REQUIREMENTS APPLICABLE TO THE AUSTRALIAN MARITIME SECTOR AND THEIR IMPLICATIONS FOR ASSESSMENT WITHIN THE TRAINING PACKAGE

The Maritime Sector of the Transport and Distribution Industry is tightly regulated by a range of International, National and State/Territory Conventions, Codes and Legislation. These regulations pertain to all aspects of maritime operations, including the construction and maintenance of vessels, the manning of vessels and their operation. The regulations are heavily focussed on the safety, quality and environmental aspects of maritime operations. Individuals employed in the Maritime Sector as a Master, Engineer, Rating, Deckhand, Marine Cook, etc. must fulfil stringent competency and training requirements as detailed in the relevant regulations. Individuals assessed as complying with these requirements are provided with Certificates of Proficiency by either the Australian Maritime Safety Authority or by the respective State/Territory Marine Authorities. These are certificates required by the relevant maritime transport legislation before an individual can be allowed to work on board a vessel in the class of occupation and the type of vessel covered under the legislation. These certificates of competency should not be confused with National educational qualifications that are issued by Registered Training Organisations such as Australian Maritime College and the NSW Department of TAFE. While in the Maritime Sector, there is a close relationship between the regulatory certificates and the National VET qualifications; they are issued by different organisations under different legislative authority.

National Marine Orders and International Maritime Codes and Conventions

In the case of vessels that operate in international waters, the **regulatory authority** is the Australian Maritime Safety Authority covering such occupations as Masters, Chief Mates, Officer in charge of a Navigational Watch, Master (Class 3), Engineer (Class 1), Engineer (Class 2), Officer in charge of an Engineering Watch, and Integrated Rating. The relevant regulations are the Marine Orders under the Australian Navigation Act. These are compliant with a range of International Maritime Conventions and Codes established by the International Maritime Organisation (IMO). The most significant of these is the Standard (STCW) Code and Convention agreed to by the participating flag state (including Australia) in 1995. Amongst a range of agreements covered in STCW 95 are functional competency standards for maritime occupations on board vessels operating in international waters. The Australian Marine Orders are consistent with the agreed requirements of STCW 95. The Transport and Distribution Training Package occupational competency standards and VET qualifications relevant to these maritime occupations have been closely aligned to the relevant sections of both the Australian Marine Orders, STCW 95 and other relevant IMO conventions and codes.

Regulations of State/Territory Marine Authorities

In the case of vessels that operate in near coastal and inshore waters, the **regulatory authority** is the relevant State/Territory Marine Authority covering such occupations as Master (Class 4), Master (Class 5), Coxswain, Master (Class 3) [working in restricted situations covered by State/Territory regulations], Engineer (Class 3), Marine Engine Driver (Grade 1), Marine Engine Driver (Grade 2), , Marine Engine Driver (Grade 3), and General Purpose Deckhand. The relevant regulations are the relevant maritime regulations administered by the various State/Territory Marine Authorities across Australia. A nationally consistent approach in the structure and administration of these regulations is achieved by means of a nationally agreed code, currently called the Uniform Shipping Laws (USL) Code. The USL Code is established and maintained by the National Marine Safety Committee (NMSC). The current USL Code is currently being updated and revised by the NMSC.

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INTRODUCTION

The 2001 version of the Maritime Training Package is in addition to the previous Transport and Distribution Training Package developed by TDT, which includes the following:

- Road Transport Competency Standards and Qualifications
- Warehousing Competency Standards and Qualifications
- Stevedoring Competency Standards and Qualifications
- Rail Operations Competency Standards and Qualifications
- Rail Passenger Services Competency Standards and Qualifications
- Rail Freight Services Competency Standards and Qualifications
- Rail Civil Infrastructure Competency Standards and Qualifications

Each Competency Standards manual includes the framework that details the requirements for completion of a qualification, under the Australian Qualification Framework.

It is important that this manual be used in conjunction with the Assessment Guidelines. Users should also reference the Australian Recognition Framework.

The Maritime Sector acknowledges the need to apply selected cross industry standards and standards from other industries. These have not been fully reproduced in this Training Package. These standards are listed at the end of this document. To ensure currency and correct usage, Registered Training Organisations and Enterprises wishing to include these standards in the development of a qualification are required to source the latest version of the standards from the original developer. Further the standards are only to be used in building Maritime qualifications at the comparable AQF level of the original standards and qualification. A maritime contextualisation statement is also contained at the end of this manual. The statement should be read in conjunction with the existing Range of Variables and Evidence Guides of competency units concerned. The additional information in the contextualisation statement should be used to ensure that training programs and assessment processes based on the standards, and designed for use with Maritime sector trainees and staff relate in a meaningful way to key aspects and requirements of the Maritime sector context, particularly safety management and the protection of the marine environment.

The Maritime Training Package is subject to continuous revision. It is suggested that users confirm the status of this manual prior to use. Confirmation can be given from:

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AUSTRALIAN QUALIFICATIONS FRAMEWORK

The Maritime Training Package provides significant flexibility to Registered Training Organisations, enterprises and individuals in packaging units together which lead to a qualification.

This level of flexibility reflects the multiple job roles, enterprise requirements and changing technological nature of the industry. It is expected however that users of this Training Package select units, which packaged together, provide a coherent qualification, inclusive of all the competencies necessary to fulfil occupation requirements.

Importantly, the flexibility of packaging available within the qualifications framework must be considered within the responsibility of individuals, enterprises and/or Registered Training Organisations to package units together to meet legislative requirements and industry codes of practice necessary at an occupational level.

In packaging units together to form a training program, users should be aware of requirements set out in the Maritime Assessment Guidelines, and the Australian Recognition Framework. The qualification framework within this manual provides the units available within each qualification level and requirements for completion of a qualification.

MARITIME SECTOR QUALIFICATIONS

The Maritime qualifications are summarised in the tables on the following pages. The qualifications reflect the competency requirements for the occupational pathways of integrated ratings, deckhands, marine engine drivers, marine engineers and deck officers working on board vessels operating in international and Australian coastal and inshore waters.

The qualifications and the component competency units have been carefully designed in conjunction with Maritime Sector advisors to align closely with the regulatory requirements and framework of the various National, State and Territory marine authorities. As appropriate, cross-industry units from other industry training packages may be incorporated into the qualifications to meet specific enterprise needs. Details of a number of cross-industry units are provided in this booklet together with a maritime sector contextualisation statement. This list of cross-industry units is not exhaustive however. Registered Training Providers and enterprises may identify a need to use other cross-industry units not on the list. In such cases, TDT Australia should be contacted to confirm the appropriateness of the proposed inclusion.

Care needs to be taken by Registered Training Organisations when structuring qualifications that trainees are not only prepared and assessed for qualifications within the Australian Qualifications Framework but also the relevant certification requirements of the Australian Maritime Safety Authority and/or the relevant State/Territory marine authorities. Registered Training Organisations are advised to refer to the relevant marine authorities to confirm certification requirements, as well as requirements of marine authorities for training providers involved in training and competency assessment for the marine sector.

This Qualifications Framework does not have specific qualifications for **marine cooks**, although some catering competency units may be incorporated into the maritime sector qualifications through the cross-industry unit provisions outlined above. Marine Cooks would usually complete the relevant qualifications in the Hospitality Industry Training Package administered by Tourism Training Australia. Nonetheless, persons involved in marine cooking and catering will still need to fulfill the mandatory pre-sea competency requirements of all sea-going personnel as covered by the following maritime competency units and the related certification requirements of the relevant marine authorities:

- TDM ME01 01A Understand orders and be understood in relation to shipboard duties
- TDM MF07 01A Observe safe working practices
- TDM MF08 01A Comply with emergency procedures
- TDM MF09 01A Fight and extinguish fires
- TDM MF10 01A Provide first aid
- TDM MF11 01A Survive at sea in the event of vessel abandonment
- TDM MF12 01A Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDM ML02 01A Contribute to effective human relationships on board a vessel

It should be noted that in both training and assessment units TDT MF8 00A 'Comply with emergency procedures', TDT MF09 00A 'Fight and extinguish fires', TDT MF11 00A 'Survive at sea in the event of vessel abandonment', and TDT MF12 00A 'Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire' will usually be covered holistically by Registered Training Organisations during training and assessment as 'elements of shipboard safety'. This combination of units is equivalent to unit SFISHIP 211A 'Take emergency action on board a vessel' in the Seafood Industry Training Package.

MARINE ENGINEERING

AQF	SUGGESTED QUALIFICATION TITLE	PROFILES COVERED		
		<i>MARITIME FUNCTIONAL CATEGORY</i>		
		<i>Management</i>	<i>Operational</i>	<i>Support</i>
AQF 6	Advanced Diploma in Transport and Distribution (Marine Engineering)	Eng (Class 1)		
AQF 5	Diploma in Transport and Distribution (Marine Engineering)	Eng (Class 2)	Off of Eng Watch	
AQF 4	Certificate IV in Transport and Distribution (Marine Engineering)	Eng (Class 3)	MED 1	
AQF 3	Certificate III in Transport and Distribution (Marine Engine Driving)		MED 2	
AQF 2	Certificate II in Transport and Distribution (Marine Engine Driving)		MED 3	
AQF 1				Basic entry skills

CHARACTERISTICS OF THE QUALIFICATION

Title:
Certificate II in Transport & Distribution (Marine Engine Driving)

Rationale:
An operational qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 2.

"Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes. Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team."

Qualification Contents:

FIELD		UNIT	
B	Equipment Checking and Maintenance	TDM MB36 01A	Prepare a small vessel's machinery for sea
		TDM MB19 01A	Carry out basic hull maintenance
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
F	Operational Quality and Safety	TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF39 01A	Maintain running log including fuel calculations and written reports
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
R	Carry Out Operations on Equipment and Systems	TDM MR18 01A	Operate deck machinery installed on a small vessel
		TDM MR19 01A	Safely handle and stow explosive and flammable materials
		TDM MR30 01A	Operate and carry out basic service checks on small vessel marine propulsion systems
		TDM MR31 01A	Operate and carry out basic servicing on auxiliary systems
		TDM MR32 01A	Operate and carry out basic routine servicing of marine extra low and low voltage electrical systems
U	Environment	TDM MU4 01A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 9 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through a marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate III in Transport & Distribution (Marine Engine Driving)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 3.

"Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the selection of equipment, services or contingency measures and within known time constraints. Applications may involve some responsibility for others. Participation in teams including group or team coordination may be involved."

Qualification Contents:

FIELD		UNIT	
B	Equipment Checking and Maintenance	TDM MB29 01A	Recognise and correct deteriorated fittings and machinery
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
F	Operational Quality and Safety	TDT MF7 01A	Observe safe working practices *
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF27 01A	Prevent, control and fight fires on board a small vessel
		TDM MF40 01A	Carry out basic operational engineering calculations
		BSXFMI409A	Implement and monitor continuous improvement systems and processes
		BSXFMI306A	Manage workplace information
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
		TDM ML3 01A	Establish and maintain a harmonious workplace environment
		BSXFMI304A	Participate in, lead and facilitate work teams
R	Carry Out Operations on Equipment and Systems	TDM MR19 01A	Safely handle and stow explosive and flammable materials
		TDM MR27 01A	Operate and maintain marine internal combustion engines on vessels of 750 kW propulsion power or less
		TDM MR28 01A	Operate and maintain auxiliary systems on vessels up to 750 kW propulsion power
		TDM MR29 01A	Operate and maintain marine low and medium voltage electrical systems
U	Environment	TDM MU4 01A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 13 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA or another marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate IV in Transport & Distribution (Marine Engineering)

Rationale:

A management qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 4.

"Performance of a broad range of skilled applications including requirements to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others."

Qualification Contents:

FIELD		UNIT	
B	Equipment Checking and Maintenance	TDM MB31 01A	Organise maintenance and repairs on a small vessel
		TDM MB35 01A	Employ Damage Control techniques for hull damage.
		TDM MB37 01A	Fabricate simple shipboard components
		TDM MB38 01A	Dismantle, inspect, repair and reassemble vessel machinery
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
F	Operational Quality and Safety	TDM MF4 01A	Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDM MF5 01A	Develop emergency and damage control plans and handle emergency situations
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF13 01A	Manage fire fighting and prevention activities
		TDM MF18 01A	Apply medical first aid on board a vessel
		TDM MF19 01A	Operate lifesaving appliances
		TDM MF27 01A	Prevent, control and fight fires on board a small vessel
		TDM MF38 01A	Establish engine room watchkeeping procedures on vessels of less than 3,000 propulsion power
		TDM MF41 01A	Carry out engineering calculations related to maintenance and operations
		BSXFMI405A	Manage operations to achieve planned outcomes
		BSXFMI406A	Manage workplace information
BSXFMI409A	Implement and monitor continuous improvement systems and processes		
BSXFMI410A	Facilitate and capitalise on change and innovation		
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
		BSXFMI404A	Participate in, lead and facilitate work teams
		BSXFMI403A	Establish and manage effective workplace relationships
N	Assessment	BSZ402A	Conduct assessment

FIELD	UNIT	
R	Carry Out Operations on Equipment and Systems	
	TDM MR19 01A	Safely handle and stow explosive and flammable materials
	TDM MR21 01A	Operate and maintain engines, machinery and auxiliary power sources on vessels of less than 3,000 propulsion power
	TDM MR22 01A	Operate and maintain boiler systems
	TDM MR23 01A	Operate and maintain batteries, starter motors and power distribution systems
	TDM MR24 01A	Operate and marine internal combustion engines and propulsion transmission systems
	TDM MR25 01A	Operate and maintain auxiliary machinery systems, including steering gear and refrigeration systems
	TDM MR26 01A	Test, maintain and operate marine electrical and control equipment.
	MEM 18.1 A	Use hand tools
	MEM 18.2 A	Use power tools/hand held operations
	MEM 5.1 A	Manual soldering / desoldering electrical. electronic components
	MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)
	MEM 5.6 A	Perform brazing and/or silver soldering
	MEM 5.7 A	Manual heating thermal cutting and gouging
	MEM 5.15 A	Weld using manual metal arc welding process
MEM 7.5 A	Perform general machining	

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 17 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA or another marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Diploma of Transport & Distribution (Marine Engineering)

Rationale:

An operational qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 5.

"The self-directed application of knowledge and skills, with substantial depth in some areas where judgement is required in planning and selecting appropriate equipment, services and techniques for self and others. Applications involve participation in development of strategic initiatives, as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team coordination and management may be involved.

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDM MA10 01A	Control trim, stability and stress
B	Equipment Checking and Maintenance	TDM MB4 01A	Maintain seaworthiness of vessel
		TDM MB12 01A	Fault-find, dismantle, maintain and repair shipboard plant and equipment
		TDM MB13 01A	Carry out shipboard fabrication and repair operations
		TDM MB15 01A	Detect and identify the cause of machinery malfunctions and repair faults on vessels over 750 kW of propulsion power
		TDM MB16 01A	Organize safe maintenance and repair procedures on vessels over 750 kW of propulsion power
		TDM MB17 01A	Test, detect faults and maintain and restore electrical / electronic control equipment to operating condition on vessels over 750 kW of propulsion power
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
		TDM ME7 01A	Use English in written and oral form to perform engineering duties
F	Operational Quality and Safety	TDM MF3 01A	Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDM MF4 01A	Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDM MF5 01A	Develop emergency and damage control plans and handle emergency situations
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF 13 01A	Manage marine fire-fighting and prevention activities
		TDM MF 14 01A	Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers
		TDM MF 15 01A	Plan and implement special safety, maintenance and emergency procedures for chemical tankers
		TDM MF 16 01A	Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDM MF18 01A	Apply medical first aid on board a vessel
		TDM MF19 01A	Operate lifesaving appliances
		TDM MF20 01A	Prevent, control and fight fires on board a vessel
		TDM MF22 01A	Maintain safety of engine equipment, systems and services on vessels of unlimited propulsion power
TDM MF24 01A	Maintain safety of engine equipment, systems and services on vessels over 750 kW of propulsion power		
TDM MF25 01A	Ensure safe working practices		

FIELD		UNIT	
F	Operational Quality and Safety (cont.)	TDM MF26 01A	Establish watchkeeping arrangements and procedures
		TDM MF31 01A	Maintain a safe engineering watch
		TDM MF37 01A	Manage vessel operations
		BSXFM1505A	Manage operations to achieve planned outcomes
		BSXFM1506A	Manage workplace information
		BSXFM1509A	Implement and monitor continuous improvement systems and processes
		BSXFM1510A	Facilitate and capitalise on change and innovation
L	Human Resources	TDM ML1 01A	Organise and manage the crew
		TDM ML2 01A	Contribute to effective human relationships on board a vessel*
		BSXFM1504A	Participate in, lead and facilitate work teams
		BSXFM1503A	Establish and manage effective workplace relationships
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
R	Carry Out Operations on Equipment and Systems	TDM MR9 01A	Operate alternators, generators and control systems to supply shipboard electrical power
		TDM MR10 01A	Operate pumping systems and associated control systems
		TDM MR11 01A	Operate main and auxiliary machinery and associated control systems
		TDM MR13 01A	Operate electrical/electronic control equipment on vessels over 750 kW of propulsion power
		TDM MR14 01A	Manage fuel and ballast operations on vessels over 750 kW of propulsion power
		TDM MR15 01A	Operate, monitor and evaluate engine performance on vessels over 750 kW of propulsion power
		TDM MR16 01A	Plan and schedule operations on vessels over 750 kW of propulsion power
		TDM MR17 01A	Start up and shut down main propulsion and auxiliary machinery and associated systems on vessels over 750 kW of propulsion power
		MEM 18.1 A	Use hand tools
		MEM 18.2 A	Use power tools/hand held operations
		MEM 5.1 A	Manual soldering / desoldering electrical, electronic components
		MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)
		MEM 5.6 A	Perform brazing and/or silver soldering
		MEM 5.7 A	Manual heating thermal cutting and gouging
		MEM 5.15 A	Weld using manual metal arc welding process
		MEM 7.5 A	Perform general machining
		U	Environment
TDM MU4 01A	Ensure compliance with pollution prevention measures		

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 20 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Advanced Diploma of Transport & Distribution (Marine Engineering)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 6.

"The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved. Significant judgement is required in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures."

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDM MA10 01A	Control trim, stability and stress
B	Equipment Checking and Maintenance	TDM MB8 01A	Detect and identify the cause of machinery malfunctions and repair faults on vessels of unlimited propulsion power
		TDM MB9 01A	Organize safe maintenance and repair procedures on vessels of unlimited propulsion power
		TDM MB10 01A	Test, detect faults, maintain and restore electrical machinery and electronic control equipment to operating condition on vessels of unlimited propulsion power
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
		TDM ME7 01A	Use English in written and oral form to perform engineering duties
F	Operational Quality and Safety	TDM MF3 01A	Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDM MF4 01A	Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDM MF5 01A	Develop emergency and damage control plans and handle emergency situations
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF 13 01A	Manage marine fire-fighting and prevention activities
		TDM MF 14 01A	Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers
		TDM MF 15 01A	Plan and implement special safety, maintenance and emergency procedures for chemical tankers
		TDM MF 16 01A	Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDM MF22 01A	Maintain safety of engine equipment, systems and services on vessels of unlimited propulsion power
		TDM MF25 01A	Ensure safe working practices
		TDM MF26 01A	Establish watchkeeping arrangements and procedures
		TDM MF37 01A	Manage vessel operations
		BSXFMI505A	Manage operations to achieve planned outcomes
		BSXFMI506A	Manage workplace information
		BSXFMI509A	Implement and monitor continuous improvement systems and processes
BSXFMI510A	Facilitate and capitalise on change and innovation		

FIELD		UNIT	
L	Human Resources	TDM ML1 01A	Organise and manage the crew
		TDM ML2 01A	Contribute to effective human relationships on board a vessel*
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
R	Carry Out Operations on Equipment and Systems	TDM MR4 01A	Operate electrical machinery and electronic control equipment on vessels of unlimited propulsion power
		TDM MR5 01A	Manage fuel, bilge and ballast operations on vessels of unlimited propulsion power
		TDM MR6 01A	Operate, monitor and evaluate engine performance on vessels of unlimited propulsion power
		TDM MR7 01A	Plan and schedule operations on vessels of unlimited propulsion power
		TDM MR8 01A	Start up and shut down main propulsion and auxiliary machinery and associated systems on vessels of unlimited propulsion power
		MEM 18.1 A	Use hand tools
		MEM 18.2 A	Use power tools/hand held operations
		MEM 5.1 A	Manual soldering / desoldering electrical, electronic components
		MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)
		MEM 5.6 A	Perform brazing and/or silver soldering
		MEM 5.7 A	Manual heating thermal cutting and gouging
		MEM 5.15 A	Weld using manual metal arc welding process
		MEM 7.5 A	Perform general machining
U	Environment	TDM MU1 01A	Monitor compliance with legislative requirements and measures to ensure protection of the marine environment

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 23 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

COMPETENCY STANDARDS

- Are the criteria to be used for any assessment leading to national recognised qualifications
- Are required to provide sufficient detail for a proper assessment of competency
- Must reflect workplace competency needs, they are not a course of training
- Are made of building blocks called units. A collection of units of competency (Competency Standards) needs to cover the full range of work activities within an industry. Sometimes units of competency from other industry sectors may be used to reduce duplication. Assessments will group together relevant units of competency
- Are to be used for assessment of new or existing employees and may assist employees to assess their own skills and knowledge and identify where training is needed
- Need to be able to be used flexibly by enterprises to reflect the different job roles and functions of individuals as well as the different business activities of the enterprise
- Competency Standards are intended to describe industry's perspective of work requirements for the industry sector or across industry.
- Standards describe:
 - The kinds of skills, knowledge and attributes needed to be applied in work activities
 - The indicators that describe when someone performs these activities well
 - What employers and workers describe as required work competence
 - The criteria used for assessment of competency
- Standards are not curriculum documents or training programs. Standards provide a basis for assessment including the recognition of current competency within the National Training Framework.

STRUCTURE AND LAYOUT OF STANDARDS

Each unit of competency consists of:

- Elements
- Performance criteria
- Range of variables
- Evidence guide

Performance Criteria, Range of Variables and Evidence Guides together identify what must be assessed for a unit of competency within the framework provided by the elements statements. Units of Competency may be assessed (and learned) in an integrated fashion with other units of competency.

UNITS OF COMPETENCY

Describe a broad area of performance.

Units of competency must:

- Be transferable and integrate a number of skills
- Define a major skills area of industry
- Relate to realistic work place activities
- Allow contextualisation to particular workplaces, products, work systems and circumstances whilst maintaining transferability

Successful achievement of units of competency would normally require the use of several skills and the application of knowledge, attitudes and values in the workplace.

Contextualisation and customisation must maintain the integrity of the units of competency.

ELEMENTS OF COMPETENCY

Identify and describe actions of outcomes (performances) which are observable. They are the smallest logical, identifiable, discrete sub-groupings of actions and knowledge that make up a unit of competency.

They are the component activities of the unit.

An element defines the skills associated with the unit. Elements provide further information on the scope of the unit of competency.

PERFORMANCE CRITERIA

Outline what people do to display competency.

Performance criteria are as precise as possible.

They:

- Describe evidence that is observable
- Describe only essential aspects of performance
- Refer to the work requirements where practicable
- Describe aspects of work organisations and the overall work role
- Avoid specifying procedures or methods

RANGE OF VARIABLES

Specify the range of contexts and conditions in which the competency is valid. Information must include:

- Legislation, regulations, codes and conventions such as OHS and pollution control regulations, USL Code, AMSA Marine Orders, IMO Conventions and Codes, etc.
- The range of equipment, processes and procedures
- Particular locations and situations
- Requirements arising from enterprise procedures and industrial arrangements

EVIDENCE GUIDES

Cover the required evidence of competency including the critical aspects of a unit that include underpinning knowledge and the relationship of the unit to other units of competency.

The Evidence Guides provide information for assessors and candidates, supplementing information given in the Performance Criteria.

KEY COMPETENCIES

There are also competencies that underlie all work, the Key Competencies. Key competencies are integrated within the units of competency and are allocated to three performance levels.

Key Competencies are seen to have the capacity to assist in the transfer of knowledge and skill to new situations eg. different equipment or software, new processes.

1. Collecting, analysing and organising information

The capacity to locate information, sift and sort information in order to select what is required and present it in a useful way, and evaluate both the information itself and the sources and methods to obtain it.

2. Communicating ideas and information

The capacity to communicate effectively with others using a range of spoken, written, graphic and other non-verbal means of expression.

3. Planning and organising activities

The capacity to plan and organise one's own work activities, including making good use of time and resources, sorting out priorities and monitoring one's own performance.

4. Working with others in teams

The capacity to interact effectively with other people both on a one-to-one basis and in groups, including understanding and responding to the needs of a client and working effectively as a member of a team to achieve a shared goal.

5. Using mathematical ideas and techniques

The capacity to use concepts such as number, space and measurement and techniques such as estimation for practical purposes.

6. Solving problems

The capacity to apply problem solving strategies in purposeful ways, both in situations where the problem and the desired solution are clearly evident and in situations requiring critical thinking and a creative approach to achieve an outcome.

7. Using technology

The capacity to apply technology, combining the physical and sensory skills needed to operate equipment with the understanding of scientific and technological principles needed to explore and adapt systems. (Mayer, 1992)

KEY COMPETENCIES	PERFORMANCE LEVEL 1	PERFORMANCE LEVEL 2	PERFORMANCE LEVEL 3
1. Collecting, analysing and organising ideas and information	Access and record - single source	Access, select and record - more than one source	Access, evaluate and organise - range of sources
2. Communicating ideas and information	Simple - familiar setting	Complex - particular context	Complex - variety of contexts
3. Planning and organising activities	Under supervision	With guidance	Independently initiate and evaluate complex activity
4. Working with others and in teams	Familiar activities	Help formulate and achieve goals	Collaborate in complex activities
5. Using mathematical ideas and techniques	Simple tasks	Select appropriate complex tasks	Evaluate and adapt as appropriate for task
6. Solving problems	Routine - minimal supervision Exploratory - close supervision	Routine – independently Exploratory - with guidance	Complex problems Implement systematic approach; explain processes
7. Using technology	Reproduce or present basic product or service	Construct organise or operate products or services	Design or tailor products or services

TDM MA10 01A CONTROL TRIM, STABILITY AND STRESS

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to control the trim and stability of a commercial vessel and the stresses on its hull and structure both under normal operating conditions and in the event of flooding following damage to one or more compartments.

The unit is consistent with the related functional standard in Section A-II/2 and A-III/3 of the STCW 95 Code and Appendix 2 and Appendix 3 of Marine Orders Part 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Control of the trim and stability of a vessel under normal operating conditions</p>	<ul style="list-style-type: none"> a. Stability analysis and weight distribution planning are conducted at a time, frequency and scope appropriate to the proposed nature of the voyage or vessel operation b. Weight distribution is organised to maintain the vessel within acceptable stability limits for anticipated operation situations likely to be experienced during the voyage c. Calculations are made to determine the draught and centre of gravity of the vessel after adding, removing or shifting weight d. Trim, draughts and list of the vessel are controlled as required to ensure they are suitable to progress all anticipated vessel operations
<p>2. Control of the trim and stability of a vessel in the event of damage and consequent flooding</p>	<ul style="list-style-type: none"> a. Damage to the vessel and the nature of flooding of compartments is promptly assessed b. The effects upon vessel stability of flooded and flooding compartments is evaluated c. A suitably strategy for maintaining or restoring trim and stability is devised d. Where stress limits of a vessel are unavoidably exceeded as a consequence of damage and/or flooding, appropriate action is initiated to ensure the safety of shipboard personnel including where necessary abandoning the vessel
<p>3. Manage the stress conditions of the vessel</p>	<ul style="list-style-type: none"> a. Stress limits of vessel are assessed in accordance with maritime principles and vessel manufacturer's specifications b. Stability of vessel is monitored at a frequency and scope relevant to the nature and speed of vessel operations or emergency and is sufficient to enable stress and stability to be maintained within acceptable limits at all times c. Appropriate action is taken promptly where weight distribution has or could exceed acceptable safety limits to ensure that the safety of the vessel and its passengers, crew and load is maximised

Range Of Variables

CONTROL TRIM, STABILITY AND STRESS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of fundamental principles of vessel construction and theories of trim and stability and stress in the development and implementation of measures to preserve the trim and stability of a vessel across a wide and often unpredictable range of normal and emergency operational contexts. The development of a broad strategy and techniques for controlling vessel trim, stability and stress is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in technical, organisational and leadership functions related to controlling the trim and stability of vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) b. Measures to control the trim and stability of the vessel may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while loading and unloading b.4. while underway b.5. during berthing and unberthing operations b.6. while anchoring or mooring b.7. when bunkering c. Measures to control the trim and stability of the vessel may include: <ul style="list-style-type: none"> c.1. adjusting weight distribution of load c.2. pumping ballast water to compensate for load distribution c.3. pumping of flooded compartments c.4. implementing damage control measures to maximise watertight integrity of hull where it has been damaged
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. IMO Conventions and Codes a.4. AMSA Marine Orders a.5. IMO SOLAS Convention a.6. vessel's log a.7. 'Trim and Stability Booklet' a.8. company procedures a.9. vessel manufacturer's instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards a.12. Class Society Rules
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO Codes and Conventions related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders concerning vessel trim and stability a.3. IMO SOLAS Convention a.4. relevant international, Australian and State/Territory OH&S legislation

CONTROL TRIM, STABILITY AND STRESS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor and control the trim and stability of the vessel <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. when loading and unloading a.1.4. when underway a.1.5. in berthing and unberthing operations a.1.6. when anchoring or mooring a.1.7. when bunkering a.2. Communicate effectively with others concerning operations to maintain the trim, stability and stresses of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master or chief mate on a ship of 500 gross tonnage or more, or a chief engineer officer or second engineer officer on a ship of 3,000kW propulsion power or more. The second engineer must also be able to take over the chief engineer's duties in an emergency situation.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of the IMO Conventions and Codes and AMSA Marine Orders b. Relevant OH&S legislation, codes of practice, policies and procedures c. Theory and calculations of vessel stability and dynamics including: <ul style="list-style-type: none"> c.1. computation of hydrostatic stability data of a ship c.2. calculation of a ship's centre of gravity, centre of buoyancy and metacentre c.3. calculation of the transverse and longitudinal stability using hydrostatic data c.4. calculation of the moment of statical stability at small angles of heel c.5. determination of the centre of gravity of a ship using an inclining experiment and effect of suspended weights c.6. determining the required correction for the height of centre of gravity (kg) for the free surface effect c.7. determination of the values of the righting lever and construction of righting lever curves c.8. Calculations for change of draught, trim and heel when entering different water densities and due to bilging of compartments. c.9. changes to draught, trim and heel due to adding or removing fuel, ballast or cargo c.10. displacement, wetted surface, form coefficients, tonne per centimetre immersion, application of Simpson's rules to first and second moments of area, centroids and centres of pressure. d. Potential problems related to the control of trim and stability for vessels of 500 gross tonnage or more and appropriate action and solutions, including: <ul style="list-style-type: none"> d.1. free surface of a liquid d.2. shift of cargo d.3. wind heel d.4. handling of heavy weights d.5. excessive trim d.6. large swell conditions d.7. dry docking d.8. grounding e. Principles of synchronous rolling and methods for its control, including an understanding of the effect on the rolling period of a vessel due to the radius of gyration f. Causes and repercussions of a heeling vessel g. Principle features of the structure of a vessel h. Properties and application of materials used in vessel construction i. Construction, layout and subdivision requirements of a typical vessel, including and understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead j. Typical construction features, stress characteristics, forces on ships under various conditions or ships of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) k. The principal stresses which act on the structure of a vessel, including panting and pounding. l. Steps involved interpreting and analysing a vessel's dynamic stability and comparing it against the IMO's minimum stability criteria m. Basic procedures and precautions for the repair and maintenance of a vessel n. Effects of density of sea water on the draught and freeboard of a vessel

Evidence Guide (continued)

CONTROL TRIM, STABILITY AND STRESS

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> o. Features of the load-line and draught marks of a vessel and procedures for carrying out related calculations p. Procedures for calculating the required load distribution to achieve the desired trim q. Typical problems related to the control of trim and stability for ships of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) and appropriate action and solutions, including: <ul style="list-style-type: none"> q.1. problems concerning the strength of structural members to resist liquid pressure and loading due to a head of liquid. q.2. problems involving shearing force and bending moments of a loaded ship in still water. r. Simple treatment of vibration. s. Bilge and ballast systems. t. Leveling arrangements for damaged side compartments.
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to maintain the trim and stability of a vessel in a range of operational situations, and/or b. maintain the trim and stability of a vessel in a range of operational situations either: <ul style="list-style-type: none"> b.1. using a simulator, meeting the requirements of Section A I/12 of the IMO STCW Code, over an appropriate range of simulated loading and operational situations b.2. in appropriate practical situations on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 controlling the trim and stability and managing the stresses of a vessel a.2 identifying and evaluating trim, stability and stress problems and determining an appropriate courses of action a.3 identifying and implementing improvements to procedures for the control of trim and stability of a vessel a.4 applying safety precautions relevant to manoeuvring operations a.5 assessing trim and stability of vessel in both normal and emergency situations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and Codes and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the trim, stability and stress limits of the vessel b.6 quality procedures (where existing) b.7 procedures to protect the integrity and security of the vessel's hull b.8 environmental protection procedures when pumping ballast water c. Action taken promptly to report and/or rectify out-of-limit trim, stability and stresses of the vessel in accordance with manufacturer's instructions, statutory requirements and company procedures d. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB4 01A MAINTAIN SEAWORTHINESS OF VESSEL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to maintain the seaworthiness of a commercial vessel, including action to preserve the watertight integrity of the vessel and to ensure that stability conditions comply with the intact stability criteria of the International Maritime Organisation under all conditions of loading.

The unit is consistent with the related functional standards in Section A III/1 and III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Maintain watertight integrity of the vessel at all times</p>	<ul style="list-style-type: none"> a. Work to maintain seaworthiness of vessel is planned and carried out in accordance with company procedures and established safety rules and regulations b. Coverage and frequency of checks and inspections on the vessel's seaworthiness complies with the company procedures and established safety rules and MES and IMO regulations c. Repairs and corrosion control are initiated and coordinated in accordance with company procedures and vessel and equipment manufacturer's instructions d. Degree of vessel security is commensurate with anticipated weather and sea conditions and necessary vessel operations e. Action taken in anticipation of environmental changes is timely and appropriate to the change f. Precautions are taken to ensure that vessel and on-board powered equipment is operated in accordance with manufacturer's instructions and codes of safe working practice g. Action taken in emergency situations is appropriate to the significance of the situation and designed to maximise watertight integrity h. Instructions to officers, crew and others are clear, concise and made at an appropriate time and place i. Records on actions taken to carry out repairs and corrosion control and to ensure watertight integrity are complete, accurate and comply with statutory, commercial and enterprise requirements.
<p>2. Ensure the vessel's stress and stability for all stages of the voyage</p>	<ul style="list-style-type: none"> a. Stability calculations and weight distribution planning is conducted at a time, frequency and scope appropriate to the proposed nature of the voyage or operation b. Weight distribution is designed to maintain the vessel within acceptable stability and stress limits for all stages of the voyage c. Trim, draughts and list are adjusted as required to safely and efficiently progress all vessel operations d. 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 within acceptable limits at all times e. Action taken where weight distribution is compromising vessel safety, is prompt and designed to maximise safety f. Tests and checks using computer-based stability programs or other appropriate methods are conducted at a frequency and scope that conform to manufacturer's instructions g. Spurious or incorrect information from stress and stability calculations that is promptly recognised and recalculated h. Records of stress and stability calculations and action to maintain trim, stability and stress levels are maintained in accordance with company procedures and regulatory requirements

Range Of Variables

MAINTAIN SEAWORTHINESS OF VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW Conventions and Codes. b. Work is performed relatively independently within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of vessel construction principles and stability and stress techniques to the management of the seaworthiness of a vessel across a wide and often unpredictable variety of operational contexts. Monitoring and supervising the implementation of a broad plan or strategy for the maintenance of the seaworthiness of a vessel is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires limited responsibility in the management of the maintenance of the seaworthiness of a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel. b. Seaworthiness of a vessel must be maintained: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of sea, weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when bunkering b.7. when loading/unloading cargo c. Action taken to check the seaworthiness of a vessel may include: <ul style="list-style-type: none"> c.1. routine inspections c.2. checks prior to departure c.3. checks on completion of a voyage c.4. checks on completion of maintenance activities c.5. checks in anticipation of a change in sea and weather conditions c.6. checks during an emergency which may have caused damage or changes to the stability and stresses of the vessel d. Means of maintaining the security and stability of a vessel include: <ul style="list-style-type: none"> d.1. closing openings d.2. taking precautions when using lifting equipment and associated equipment d.3. position, stowage and lashing of cargo, stores and equipment d.4. action to avoid or minimise cargo shift during a voyage d.5. distribution of load on vessel d.6. ballast management d.7. measures to avoid corrosion and metal fatigue on the hull d.8. damage control measures to maintain, stabilise or restore the watertight integrity of the hull e. Maintenance may include: <ul style="list-style-type: none"> e.1. repairs to equipment, components and vessel's structure and appliances e.2. surface preparation and painting e.3. antifouling e.4. lubrication e.5. replacement of faulty equipment or components f. Stability and stress parameters may include: <ul style="list-style-type: none"> f.1. transverse stability – both dynamic and static f.2. longitudinal stability f.3. free surface effect f.4. torsion f.5. bending moments f.6. shear forces f.7. abnormal stability and stresses experienced in emergency and damage situations

Range Of Variables (continued)

MAINTAIN SEAWORTHINESS OF VESSEL

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. IMO Conventions and Class Rules a.4. AMSA Marine Orders a.5. 'Trim and Stability Booklet' a.6. company procedures a.7. maintenance schedules and records a.8. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.9. instructions of relevant Maritime Authorities related to the seaworthiness of vessels a.10. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO Conventions related to the seaworthiness of vessels a.2. ISM Code a.3. relevant sections of AMSA Marine Orders related to the seaworthiness of vessels a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MAINTAIN SEAWORTHINESS OF VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor and evaluate the seaworthiness of the vessel under normal and emergency situations a.2. Take appropriate action to maintain trim, stability and stresses of the vessel within safe limits a.3. Take appropriate preventative and remedial action to maintain the security and watertight integrity of the vessel's hull a.4. Initiate and coordinate maintenance, repair or replacement of faulty or damaged equipment or vessel's structure in accordance with company procedures and manufacturer's instructions a.5. Identify typical problems related to trim stability and stress of a vessel and the watertight integrity of the hull and take appropriate action in conjunction with other officers and crew a.6. Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations a.7. Communicate effectively with others when taking action to maintain the seaworthiness of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a navigational watch on a vessel of 500 gross tonnage or more, or officer in charge of an engineering watch on a vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of the IMO STCW 95 Code and AMSA Marine Orders dealing with the seaworthiness of vessels b. ISM Code and associated ship's Safety Management System and procedures c. Relevant OH&S and pollution control legislation and policies d. Procedures for the checking and inspecting a vessel's seaworthiness to ensure compliance with the company procedures and established safety rules and regulations e. Principles and procedures to ensure the watertight integrity of a vessel's hull in both normal and emergency situations f. Damage control measures that may be required to maintain the integrity of the hull in a range of typical emergency situations that could occur on a vessel g. Procedures for the initiation and coordination of repair and/or replacement procedures h. Corrosion control measures including surface preparation and painting and antifouling i. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations j. Theory and calculations of vessel stability and dynamics including: <ul style="list-style-type: none"> j.1. computation of hydrostatic stability data of a vessel j.2. calculation of a vessel's metacentre j.3. calculation of the transverse and longitudinal stability using hydrostatic data j.4. calculation of the moment of statical stability at small angles of heel j.5. determination of the centre of gravity of a vessel using an inclining experiment j.6. determining the required correction for the height of centre of gravity for the free surface effect j.7. determination of the values of the righting lever and construction of righting lever curves j.8. calculations for change of draught and trim when entering different water densities k. Principle features of the structure of a vessel l. A basic understanding of the properties and application of materials used in vessel construction m. Construction, layout and subdivision requirements of a typical vessel, including and understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead n. Typical construction features and stress characteristics for vessels of 500 gross tonnage or more or 3,000 kW propulsion power or more o. The principal stresses which act on the structure of a vessel p. Effects of density of sea water on the draught and freeboard of a vessel q. Features of the load-line and draught marks of a vessel and methods for performing related calculations r. Maritime communication techniques needed s. Problems related to the control of trim, stability and stresses of vessels and appropriate action and solutions t. Records that must be maintained on the seaworthiness of a vessel

Evidence Guide (continued)

MAINTAIN SEAWORTHINESS OF VESSEL

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to maintain the seaworthiness of a vessel in a range of operational situations, and/or b. assist in maintaining the seaworthiness of a vessel in a range of operational situations either: <ul style="list-style-type: none"> b.1. using a simulator, meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of simulated loading and operational situations b.2. in appropriate practical situations on an operational commercial or training vessel
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 carrying out routine and emergency checks and inspections of a vessel's seaworthiness a.2 identifying and evaluating problems concerning the trim, heel, stability and stresses on a vessel and the integrity of its hull and determining an appropriate courses of action a.3 initiating and coordinating maintenance activities required to ensure the seaworthiness of a vessel a.4 applying safety precautions relevant to maintenance operations a.5 identifying and implementing improvements to procedures for maintaining the seaworthiness of a vessel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to the trim, stability and stress limits of the vessel b.5 procedures to protect the integrity and security of the vessel's hull b.6 environmental protection procedures when pumping ballast water c. Action taken promptly to report and/or rectify out-of-limit trim, stability and stresses of the vessel or problems with the integrity of the vessel's hull in accordance with manufacturer's instructions, statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

**TDM MB8 01A DETECT AND IDENTIFY THE CAUSE OF MACHINERY
MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF
UNLIMITED PROPULSION POWER**

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required by an Engineer Class 1 to detect and identify the cause of machinery malfunctions and repair faults on a commercial vessel powered by main propulsion machinery of unlimited propulsion power. This includes the management and coordination of relevant maintenance and fault-finding activities and the application of advanced diagnostic and problem solving techniques to maintenance procedures.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and the AMSA Marine Orders Part 3, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage the detection, identification and investigation of machinery malfunctions and faults</p>	<ul style="list-style-type: none"> a. The detection, identification and investigation of machinery malfunctions and faults is coordinated and managed in accordance with the responsibilities of an Engineer Class 1. b. The operation of shipboard machinery is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance c. Out of specification performance and faults are identified in accordance with marine engineering practice d. Advanced diagnostic techniques are used to investigate poor performance and faults and appropriate action is initiated to rectify the identified problems in accordance with the responsibilities of an Engineer (First Class) e. Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions f. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with company procedures and established marine engineering practice g. Decisions made to carry out temporary or permanent repairs depending on the vessel's position and circumstances h. Appropriate consultation taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required i. Management of the repair processes and the organisation and control of engine room personnel to facilitate repairs is in accordance with company procedures and established marine engineering practice

<p>2. Repair faults in machinery</p>	<ul style="list-style-type: none"> a. Identified faults in shipboard machinery are investigated using advanced fault-finding and problem solving techniques in accordance with the responsibilities of an Engineer (First Class) b. Malfunctioning or faulty machinery is correctly isolated, disassembled, if necessary, in accordance with manufacturer's instructions and established marine engineering practice c. Damaged or faulty components are repaired or replaced in accordance with company planned maintenance system or procedures, manufacturer's instructions and established marine engineering practice d. Repaired machinery is re-assembled in accordance with manufacturer's instructions and established marine engineering practice e. Repaired machinery is re-started and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel f. Performance of repaired machinery and associated safety devices, control systems and alarms is tested in accordance with manufacturer's instructions g. Performance against recommended performance specifications is confirmed and the machinery is re-commissioned in accordance with vessel's procedures
<p>3. Complete maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to maintenance and repair operations and machinery failure incidents b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements, the ISM Code and regulations
<p>4. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Tests, inspections and repairs of vessel machinery and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations d. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed e. Action is taken in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and persons involved and shipboard emergency and contingency plans followed

Range Of Variables

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice and advanced diagnostic techniques to the repair of machinery typically found on a vessel of unlimited propulsion power across a wide and often unpredictable variety of machinery malfunctions or faults. Contribution to the development and implementation of a broad plan or strategy for shipboard machinery maintenance and repair is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to machinery repair operations and procedures. This includes management and control of personnel, analysis of the situation and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Machinery may include that typically found on any Australian or international commercial vessel of unlimited propulsion power b. Machinery performance monitoring and repair may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of machinery may include: <ul style="list-style-type: none"> c.1. steam, diesel, diesel electric and gas turbine propulsion systems and controls c.2. electrical systems and controls including primemovers c.3. batteries, transformers, switchboard, distributions systems, lighting systems c.4. steering gear, stabilizers, bow thrusters, rudders c.5. fluid power systems and controls c.6. deck machinery c.7. pumps and pumping systems c.8. auxiliary systems and controls, including <ul style="list-style-type: none"> c.8.1. fresh and salt water cooling systems c.8.2. diesel generators c.8.3. turbo alternators c.8.4. lubricating oil cooling systems c.8.5. fuel, oil, gas, coal c.8.6. air starting c.8.7. lubrication c.8.8. bilge and ballast system, oily water separator c.8.9. refrigeration and air-conditioning plant and equipment c.8.10. personal and cargo ventilation systems c.8.11. onboard air compressors and compressed air and control air systems c.8.12. waste management and pollution control systems as per the MARPOL Convention c.8.13. evaporators c.8.14. inert gas generator c.8.15. cargo pumps, tank washing machines and associated systems c.8.16. purifiers and clarifiers c.8.17. heaters and heat exchangers c.8.18. sewage plant c.8.19. fixed fire fighting installations and fire control systems c.8.20. portable fire fighting equipment c.8.21. auxiliary boilers and waste heat generators c.8.22. life saving appliances c.8.23. maintenance to hull and vessel side valves c.8.24. radio and navigation equipment

Range Of Variables (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>d. Propulsion plant configurations may include:</p> <ul style="list-style-type: none"> d.1. low speed, medium and high speed diesel propulsion d.2. stern tube bearing d.3. fixed pitch and CPP d.4. direct drive shaft d.5. diesel electric d.6. steam turbine propulsion – oil/gas/coal-fired boilers d.7. gas turbine d.8. reduction gears d.9. thrust blocks, detuners and shaft bearings <p>e. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> e.1. meters, gauges and other test equipment e.2. computer displays of performance parameters e.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. e.4. greasing and lubrication tools e.5. electric power tools, such as grinders, lathes, drills, etc. e.6. pneumatic power tools, such as grinders, sanders, drills, etc. e.7. welding equipment e.8. block and tackle e.9. portable and manual lifting equipment and hydraulic jacks e.10. material safety data sheets e.11. protective clothing and equipment such as: <ul style="list-style-type: none"> e.11.1. eye and ear protection e.11.2. safety boots e.11.3. dust and fume masks <p>f. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> f.1. moving heavy loads in an unsafe working environment f.2. unsecured machinery, components or repair equipment f.3. slippery deck f.4. welding equipment f.5. sharp tools and implements f.6. power tools f.7. moving and rotating machinery f.8. flammable liquids, vapours and fuel f.9. faulty machinery equipment handling equipment and lifting gear f.10. using equipment beyond safe working limits f.11. poor housekeeping procedures f.12. non-compliance with safe working procedures f.13. electrical wiring and systems f.14. hot pipes and valves (steam, fuel oil, lubricating oil) f.15. cold pipes and valves (refrigeration and liquefied gas cargoes) f.16. working at heights and in confined spaces <p>g. Emergencies may include:</p> <ul style="list-style-type: none"> g.1. loss of propulsion g.2. loss of electrical power g.3. loss of steerage g.4. flooding of engine room g.5. fire or explosion in engine room g.6. loss of refrigeration g.7. loss of water making ability g.8. loss of control systems g.9. fuel oil, lubrication oil, steam and gas leaks g.10. overheating and overspeed of machinery, governors, emergency trips

Range Of Variables (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.4. maintenance log, running sheets and records a.5. computer database of running information and maintenance records a.6. vessel's survey as it relates to shipboard machinery a.7. vessel's safety and emergency contingency plans and procedures a.8. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.9. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders, class society rules dealing with shipboard machinery maintenance, repair and survey inspections a.10. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard machinery maintenance and repair on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage maintenance activities at the level of responsibility of an Engineer (Class 1) a.2. Monitor the performance of shipboard machinery against specifications on a vessel of unlimited propulsion power a.3. Identify malfunctioning and faulty machinery and components and initiate appropriate action for repair or replacement a.4. Apply advanced diagnostic techniques to the trouble-shooting of malfunctioning and faulty machinery and carry out required repairs in accordance with established marine engineering practice and at the level of responsibility of an Engineer (Class 1) a.5. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation, maintenance and repair of shipboard machinery a.6. Identify machinery maintenance faults and repair problems and hazards and take appropriate action a.7. Communicate effectively with others during maintenance and repair operations a.8. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the management of shipboard machinery maintenance and repair operations on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the checking, maintenance and repair of marine machinery including electrical machinery, systems and equipment d. Operational characteristics and performance specifications for the different types of shipboard machinery usually found on a vessel of 3,000kW propulsion power or more e. Advanced diagnostic techniques for carrying out shipboard machinery testing, trouble-shooting and repair as part of maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations f. Procedures for coordinating the overall management of planned maintenance systems and procedures for the condition monitoring of machinery, including responsibilities and requirements covered by various forms of vessel survey g. The nature and causes of typical shipboard machinery malfunctions and the available methods for their detection and repair, including advanced marine machinery malfunction fault-finding techniques h. Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions i. Safe procedures for handling heavy machinery and component parts during maintenance and repair of shipboard machinery j. Safe procedures for the use of hand and power tools and maintenance equipment during maintenance and repair of shipboard machinery k. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock l. Safety, environmental and hazard control precautions and procedures relevant to shipboard machinery inspection and maintenance operations m. Principle features of vessel construction and principles of transverse and longitudinal stability n. A basic understanding of the properties and application of materials and structures typically used in the construction of a vessel of unlimited propulsion power and its associated operational machinery o. Types of maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities p. Maritime communication techniques needed during maintenance and repair operations q. Knowledge and ability to read and interpret material safety data sheets r. Procedures for the testing of boiler water, machinery cooling water and lubricating oil

Evidence Guide (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF UNLIMITED PROPULSION POWER

3. Required knowledge and skills
(continued)
- s. Knowledge and ability to read and interpret machinery performance readings and indications
 - t. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams
 - u. Principles of fluid power control systems, including:
 - u.1. system function requirements
 - u.2. methods of displaying system functions
 - u.3. elementary programming and program modification for programmable logic controllers (PLCs)
 - u.4. safety requirements
 - v. Principles of air-conditioning and refrigeration systems, including:
 - v.1. principles of operation
 - v.2. performance indicators
 - v.3. characteristics, hazards and handling requirements of CFCs and HCFCs
 - v.4. safety and environmental requirements of air-conditioning and refrigeration systems
 - w. Principles and procedures of machinery lubrication, including:
 - w.1. theory and types of lubrication
 - w.2. relative characteristics, and applications of mineral and synthetic oils
 - w.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - x. Principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery, including:
 - x.1. statics (primarily non-concurrent systems)
 - x.2. friction
 - x.3. dynamics
 - x.4. balancing
 - x.5. simple harmonic motion
 - x.6. radial, circumferential and, longitudinal stress
 - x.7. strain energy
 - x.8. beam deflection
 - x.9. buckling and crippling loads and struts
 - x.10. combined stress, shear stress
 - x.11. fluid mechanics
 - x.12. losses in pipes, fittings and pumps
 - x.13. torsion, hollow and solid shafts
 - x.14. loads due liquid head
 - x.15. structural strength and vibration of vessels
 - x.16. gears including epicyclic gearing
 - y. Principles of transverse and longitudinal stability and principles of naval architecture and vessel construction relevant to detection, identification and repair of faults, including:
 - y.1. draught, trim and heel
 - y.2. forces on the rudder and stress in the rudder stock
 - y.3. propellers
 - y.4. structural strength and vibration of vessels
 - y.5. vessel measurement and classification
 - y.6. load line
 - y.7. stability calculations
 - y.8. free surface effects
 - y.9. dry docks
 - y.10. lifesaving equipment
 - y.11. hull repairs and maintenance
 - z. Principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:
 - z.1. heat transfer, including log mean temperature and circular pressure vessels
 - z.2. gases
 - z.3. gas cycles
 - z.4. properties and expansion of steam
 - z.5. steam cycles including a specific understanding of the use of entropy charts and modifications to the steam cycle
 - z.6. boilers and evaporators
 - z.7. steam turbines, including an understanding of isentropic efficiency
 - z.8. combustion with a specific understanding of volumetric analysis
 - z.9. refrigeration and air conditioning, including the use of entropy charts.

Evidence Guide (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3 Required knowledge and skills (continued)</p>	<ul style="list-style-type: none">aa. Principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including:<ul style="list-style-type: none">aa.1. electromagnetism and electrostaticsaa.2. the electric circuitaa.3. electrolytic action and cellsaa.4. theory and calculations of relevant AC and DC machinesaa.5. cabling, distribution and lighting systemsaa.6. control gearaa.7. switch gearaa.8. deck machineryaa.9. principles, calculations and diagnostics for shipboard electronic components and systems, including:<ul style="list-style-type: none">aa.9.1. electronics principlesaa.9.2. integrated circuitsaa.9.3. microprocessors,aa.9.4. PLCsaa.9.5. process control theoryaa.9.6. instruments, calibration and testingaa.9.7. electronic control, surveillance, measurement and recording systemsaa.9.8. telemetering devicesaa.9.9. alarm systemsaa.9.10. main and auxiliary machinery control and UMSbb. Ability to use and care for hand, power and special toolscc. Understanding of special machinery and equipment required for special cargoes such as chemicals, oil, refrigerated products, etc.
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none">a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to check and repair machinery and equipment typically found on a vessel of unlimited propulsion power, including the ability to identify an appropriate range of possible machinery malfunctions and carry out related maintenance and repair solutions; and/orb. Carry out checks and related repairs of shipboard machinery in a range of operational situations on a commercial or training vessel of 3,000kW propulsion power or more

Evidence Guide (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 assessing operational performance of shipboard mechanical and electrical machinery and equipment a.2 identifying shipboard mechanical and electrical machinery and equipment malfunctions and faulty plant and equipment of a vessel of unlimited propulsion power a.3 taking action to minimise any damage and pollution that could be caused by machinery malfunctions a.4 managing, controlling and carrying out repairs of shipboard mechanical and electrical machinery and equipment maintenance and repairs a.5 applying advanced diagnostic techniques when identifying and evaluating mechanical and electrical machinery and equipment maintenance and repair problems and determining an appropriate courses of action a.6 identifying and implementing improvements to mechanical and electrical machinery and equipment checking, maintenance and repair procedures a.7 applying safety precautions relevant to mechanical and electrical machinery and equipment maintenance and repair operations a.8 completing mechanical and electrical machinery and equipment maintenance and repair documentation and records <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations, pollution control and hazard prevention policies and procedures b.3 issue resolution procedures b.4 ISM Code safety management system procedures and work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations b.5 machinery security procedures b.6 following on-board housekeeping processes b.7 waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is managed, controlled and completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB9 01A ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required by an Engineer (Class 1) to organise safe maintenance and repair procedures on a commercial vessel powered by main propulsion machinery of unlimited propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
1. Plan and manage safe maintenance and repair procedures	<ul style="list-style-type: none"> a. Shipboard maintenance and repair requirements and goals are identified and defined in accordance with the responsibilities of an Engineer (Class 1) b. Maintenance and repair operations and functions are correctly planned and managed using appropriate project planning and management techniques c. Maintenance resources and personnel are assigned to achieve established maintenance and repair requirements and goals in accordance with company procedures d. Access and arrangements for shore-based contractors carrying out maintenance activities on the vessel are planned and organised in accordance with established procedures consistent with the responsibilities of an Engineer (Class 1)
2. Plan and prepare for classification and statutory machinery surveys	<ul style="list-style-type: none"> a. Classification Society and statutory surveys are planned and prepared in accordance with regulatory class and statutory requirements b. Compartments are prepared and gas freed as required for survey in accordance with established procedures and safe working practices c. Regions of vessel requiring routine shipboard close-up inspection and maintenance are carried out in accordance with Classification Society hull life extension programs d. Inspection, survey repair and maintenance procedures for machinery, hull work, propellers and shafting are analysed and planned in accordance with regulatory and survey requirements e. Dry-docking, in-water hull-cleaning and vessel lay-up are planned in accordance with established marine practice and regulatory /survey requirements
3. Monitor the completion of shipboard maintenance and repair activities	<ul style="list-style-type: none"> a. Shipboard preventative maintenance procedures are managed and completed in accordance with the responsibilities of an Engineer (Class 1) b. Appropriate response is organised to reported faults and damage to the vessel and its equipment in accordance with vessel procedures and established engineering management practice c. Inspections of completed maintenance and repair work are carried out as per vessel survey requirements and established engineering practice d. Vessel's internal communication system is used in accordance with established procedures
4. Lead engine-room personnel to achieve planned maintenance goals	<ul style="list-style-type: none"> a. Maintenance goals and job functions are clearly defined and communicated to engine-room personnel b. Engine-room personnel are motivated to achieve planned maintenance goals using established leadership methods in accordance with the responsibilities of an Engineer (Class 1) c. Maintenance performance standards for engine-room personnel are set, monitored and improved in accordance with established management practice and company procedures d. Effective decision-making and problem-solving techniques are applied to engine room maintenance and personnel problems e. Conflicts between personnel are resolved using established conflict-resolution procedures

<p>5. Complete maintenance and repair documentation</p>	<p>a. Correct records are made relating to the organisation and inspection of maintenance and repair operations and machinery failure incidents</p> <p>b. All maintenance and repair documentation is completed in accordance with survey and company requirements, class and statutory regulations</p>
<p>6. Establish safety management and hazard control strategies</p>	<p>a. Safety management strategies for shipboard maintenance and repair operations are developed and implemented in accordance with class, regulatory requirements and company procedures</p> <p>b. Maintenance and repair hazards are identified and appropriate strategies established to minimise or eliminate risk to personnel, vessel and the environment</p> <p>c. Procedures and precautions are correctly applied to reduce the risk of scavenge and uptake fires and starting airline, crankcase and gearbox explosions</p> <p>d. Procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are established and communicated to relevant engine room crew</p> <p>e. Personnel are trained and action is organised in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and persons involved</p>

Range Of Variables

ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the scope of responsibility of an Engineer (Class1). c. Work involves the application of management principles to the organisation of the maintenance and repair of the hull, structures, machinery and equipment typically found on a vessel of unlimited propulsion power across a wide and often unpredictable variety of operational contexts. Contribution to the development and implementation of a broad plan or strategy for shipboard machinery maintenance and repair is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to shipboard maintenance and repair operations and procedures within the scope of responsibility of an Engineer (Class1). This includes management, training and control of personnel, analysis of the situation, problem solving and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The hull, structures, machinery and equipment to be maintained may include that typically found on any Australian or international commercial vessel of unlimited propulsion power b. Maintenance and repair operations may be carried out on all main, auxiliary and ancillary machinery including: <ul style="list-style-type: none"> b.1. steam, diesel, diesel electric and gas turbine propulsion systems and controls b.2. electrical systems and controls including primemovers b.3. batteries, transformers, switchboard, distributions systems, lighting systems b.4. steering gear, stabilizers, bow thrusters, rudders b.5. fluid power systems and controls b.6. deck machinery including cranes and winches b.7. pumps and pumping systems b.8. auxiliary systems and controls, including <ul style="list-style-type: none"> b.8.1. fresh and salt water cooling systems b.8.2. lubricating oil cooling systems b.8.3. fuel, oil, gas, coal b.8.4. air starting b.8.5. lubrication b.8.6. bilge and ballast system, oily water separator b.8.7. refrigeration and air-conditioning plant and equipment b.8.8. onboard air compressors and compressed air and control air systems b.8.9. waste management and pollution control systems as per the MARPOL Convention b.8.10. evaporators b.8.11. inert gas generator b.8.12. cargo pumps, tank washing machines and associated systems b.8.13. purifiers and clarifiers b.8.14. heaters b.8.15. sewage plant b.8.16. fixed fire fighting installations and fire control systems b.8.17. auxiliary boilers and waste heat generators b.8.18. life saving and fire fighting appliances b.8.19. maintenance to hull and vessel side valves b.8.20. anchoring and mooring equipment b.8.21. maintenance of plant associated with the carriage of dangerous goods c. Organisation of maintenance and repair operations may be carried out <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather c.3. while underway c.4. during berthing and unberthing operations c.5. while anchored or moored c.6. when bunkering c.7. during cargo operations

Range Of Variables (continued)

ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> d. Organisation of maintenance and repair operations may include: <ul style="list-style-type: none"> d.1. development of maintenance and repair plans d.2. planning and organisation of statutory and Classification Society surveys d.3. training, leading and motivating engine-room staff d.4. monitoring and inspection of maintenance work d.5. development and implementation of maintenance and repair safety management procedures and hazard minimisation strategies d.6. completion of running logs and maintenance reports e. Propulsion plant configurations may include: <ul style="list-style-type: none"> e.1. low speed, medium and high speed diesel propulsion e.2. Stern tube bearing e.3. CPP e.4. direct drive shaft e.5. diesel electric e.6. steam e.7. gas turbine e.8. reduction gears e.9. thrust blocks, detuners and shaft bearings f. Emergencies may include: <ul style="list-style-type: none"> f.1. loss of propulsion f.2. loss of electrical power f.3. loss of steerage f.4. flooding of engine room f.5. fire or explosion in engine room f.6. loss of refrigeration f.7. loss of water making ability f.8. fuel oil, lubrication oil, steam and gas leaks f.9. overheating and overspeed of machinery, governors, emergency trips g. Testing and repair equipment may include: <ul style="list-style-type: none"> g.1. meters, gauges and electronic instrumentation and other test equipment g.2. computer displays of performance parameters g.3. hand tools, such as spanners, soldering irons, pliers, cutters, screwdrivers, hacksaws, etc. g.4. greasing and lubrication equipment g.5. electric power tools, such as grinders, lathes, drills, etc. g.6. pneumatic power tools, such as grinders, sanders, drills, etc. g.7. welding equipment g.8. block and tackle and portable and manual lifting equipment and jacks g.9. protective clothing and equipment such as: <ul style="list-style-type: none"> g.9.1. eye and ear protection g.9.2. safety boots and helmet g.9.3. dust and fume masks g.9.4. boilersuit / overalls h. Maintenance and repair hazards may include: <ul style="list-style-type: none"> h.1. moving heavy loads in an unsafe work environment h.2. unsecured machinery, components or repair equipment h.3. slippery deck h.4. welding equipment h.5. sharp tools and implements h.6. power tools h.7. moving and rotating machinery h.8. flammable liquids, vapours and fuel h.9. faulty machinery equipment handling equipment and lifting gear h.10. using equipment beyond safe working limits h.11. poor housekeeping procedures h.12. non-compliance with safe working procedures h.13. electrical wiring and systems h.14. faulty earthing on systems and equipment h.15. hot pipes and valves (steam, fuel oil, lubricating oil) h.16. cold pipes and valves (refrigeration and liquefied gas cargoes) h.17. working at heights and in confined spaces h.18. noxious and dangerous cargoes

Range Of Variables (continued)

ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none">a.1. ISM Code safety management system plans, procedures, checklists and instructionsa.2. vessel and company's planned maintenance system, repair procedures and instructionsa.3. machinery and vessel manufacturer's specifications, instructions and recommended proceduresa.4. maintenance log, running sheets and records, including computer database of running information and maintenance records where relevanta.5. vessel's survey procedures and instructions as they relates to shipboard machinerya.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery maintenance and repaira.7. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none">a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to maintenance and repair operations and surveys on vessels of unlimited propulsion powera.2. relevant international, Australian and State/Territory OH&S legislationa.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Organise, plan and manage surveys, maintenance and repairs on a vessel within the scope of responsibility of an Engineer (Class 1) a.2. Lead and motivate the engine room crew to the achievement of shipboard maintenance and repair goals a.3. Monitor and inspect maintenance and repair on a vessel of unlimited propulsion power as per vessel survey requirements a.4. Establish and implement a safety management strategy for maintenance and repair operations on a vessel of unlimited propulsion power a.5. Identify typical machinery maintenance and repair problems and hazards and establish appropriate hazard control strategies within the scope of responsibility of an Engineer (Class 1) a.6. Communicate effectively with others during the organisation and management of maintenance and repair operations including effective use of internal communication systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO Conventions and codes and AMSA Marine Orders applicable to the management of machinery maintenance and repair operations on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Advanced diagnostic techniques for carrying out shipboard machinery testing, trouble-shooting and repair as part of maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations d. Procedures for coordinating the overall management of planned maintenance systems and procedures for the condition monitoring of machinery, including responsibilities and requirements covered by various forms of vessel survey e. Established engineering management practice for organising and inspecting the maintenance and repair of marine machinery, structures and equipment including personnel management and training requirements f. Engineering project scheduling and planning methods including the use of GANTT charts and CPM / PERT network techniques g. Functions and responsibilities of the engine room personnel for survey, maintenance and repair operations onboard a vessel of unlimited propulsion power h. Established staff leadership and motivational principles and techniques, including conflict resolution procedures i. Maintenance hazards and hazard identification and control strategies j. Operational characteristics and performance specifications for the different types of shipboard machinery and equipment usually found on a vessel of 3,000kW propulsion power or more k. Procedures for carrying out shipboard machinery testing, trouble-shooting and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations l. Planned maintenance systems and procedures for the condition monitoring of shipboard machinery, structures and equipment, including responsibilities and requirements covered by various forms of vessel survey m. Planning and operational procedures for dry docking and refloating, in-water cleaning and survey, and vessel lay-up n. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock o. Procedures for the testing of boiler water, machinery cooling water and lubricating oil p. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, operational manuals, specifications and electrical and control circuit diagrams q. A basic understanding of the properties, characteristics and application of materials and structures typically used in the construction of a vessel of unlimited propulsion power and its associated operational machinery and a basic knowledge of the properties and characteristics of liquids, fuels, lubricants, gases and vapours used onboard vessel

Evidence Guide (continued)

ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

3. Required knowledge and skills
(continued)
- r. Principle features of vessel construction and principles of transverse and longitudinal stability
 - s. Knowledge and ability to read and interpret machinery performance readings and indications
 - t. Knowledge and ability to read and interpret Material Safety Data Sheets
 - u. The nature and causes of typical shipboard machinery / equipment malfunctions and the available methods for their detection and repair, including machinery malfunction fault-finding techniques
 - v. Maintenance and repair hazards and problems and appropriate preventative and remedial strategies
 - w. Principles, consequences and prevention strategies for scavenge and uptake fires and starting airline, crankcase and gearbox explosions
 - x. Safety and environmental management strategies applicable to maintenance and repair operations on a vessel of unlimited propulsion power, including:
 - x.1. requirements specified in Material Safety Data Sheets and OHS regulations
 - x.2. safety, environmental and hazard control precautions and procedures relevant to shipboard machinery inspection and maintenance operations
 - x.3. safe procedures for handling heavy machinery and component parts during maintenance and repair of shipboard machinery
 - x.4. safe procedures for the use of hand and power tools and maintenance equipment during maintenance and repair of shipboard machinery, structures and equipment
 - y. Principles of fluid power control systems, including:
 - y.1. system function requirements
 - y.2. methods of displaying system functions
 - y.3. elementary programming and program modification for programmable logic controllers (PLCs)
 - y.4. safety requirements
 - z. Principles of air-conditioning and refrigeration systems, including:
 - z.1. principles of operation
 - z.2. performance indicators
 - z.3. characteristics, hazards and handling requirements of CFCs and HCFCs
 - z.4. safety and environmental requirements associated with air-conditioning and refrigeration systems
 - aa. Principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery, including:
 - aa.1. statics (primarily non-concurrent systems)
 - aa.2. friction
 - aa.3. dynamics
 - aa.4. balancing
 - aa.5. simple harmonic motion
 - aa.6. radial, circumferential and, longitudinal stress
 - aa.7. strain energy
 - aa.8. beam deflection
 - aa.9. buckling and crippling loads and struts
 - aa.10. combined stress, shear stress
 - aa.11. fluid mechanics
 - aa.12. losses in pipes, fittings and pumps
 - aa.13. torsion, hollow and solid shafts
 - aa.14. loads due liquid head
 - aa.15. structural strength and vibration of vessels
 - aa.16. gears including epicyclic gearing
 - bb. Principles of transverse and longitudinal stability and principles of naval architecture and vessel construction relevant to detection, identification and repair of faults, including:
 - bb.1. draught, trim and heel
 - bb.2. forces on the rudder and stress in the rudder stock
 - bb.3. propellers
 - bb.4. structural strength and vibration of vessels
 - bb.5. vessel measurement and classification
 - bb.6. load line
 - bb.7. stability calculations
 - bb.8. free surface effects
 - bb.9. dry docks
 - bb.10. lifesaving equipment
 - bb.11. hull repairs and maintenance

Evidence Guide (continued)

ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none">cc. Principles and procedures of machinery lubrication, including:<ul style="list-style-type: none">cc.1. theory and types of lubricationcc.2. relative characteristics, and applications of mineral and synthetic oilscc.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricantsdd. Types of maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authoritiesee. Maritime communication techniques needed during maintenance and repair operationsff. Principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:<ul style="list-style-type: none">ff.1. heat transfer, including log mean temperature and circular pressure vesselsff.2. gasesff.3. gas cyclesff.4. properties and expansion of steamff.5. steam cycles including a specific understanding of the use of entropy charts and modifications to the steam cycleff.6. boilers and evaporatorsff.7. steam turbines, including an understanding of isentropic efficiencyff.8. combustion with a specific understanding of volumetric analysisff.9. refrigeration and air conditioning, including the use of entropy charts.gg. Principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including:<ul style="list-style-type: none">gg.1. electromagnetism and electrostaticsgg.2. the electric circuitgg.3. electrolytic action and cellsgg.4. theory and calculations of relevant AC and DC machinesgg.5. cabling, distribution and lighting systemsgg.6. control geargg.7. switch geargg.8. deck machinerygg.9. principles, calculations and diagnostics for shipboard electronic components and systems, including:<ul style="list-style-type: none">gg.9.1. electronics principlesgg.9.2. integrated circuitsgg.9.3. microprocessors,gg.9.4. PLCsgg.9.5. process control theorygg.9.6. instruments, calibration and testinggg.9.7. electronic control, surveillance, measurement and recording systemsgg.9.8. telemetering devicesgg.9.9. alarm systemsgg.9.10. main and auxiliary machinery control and UMS.
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none">a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to organise the maintenance and repair of structures, machinery and equipment typically found on a vessel of unlimited propulsion power; and/orb. Organise surveys, maintenance and repair operations in a range of operational situations on a commercial or training vessel of unlimited propulsion power

Evidence Guide (continued)

ORGANIZE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 planning and organising survey, maintenance and repair operations a.2 assessing operational performance of shipboard machinery and equipment a.3 identifying shipboard machinery malfunctions and faulty plant and equipment and initiating appropriate action to minimise any damage and pollution that could be caused a.4 monitoring and inspecting shipboard machinery maintenance and repairs a.5 identifying and evaluating machinery maintenance and repair problems and determining an appropriate courses of action a.6 establishing safety management strategies relevant to mechanical and electrical machinery and equipment maintenance and repair operations a.7 completing machinery maintenance and repair documentation and records a.8 organising and training personnel <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations b.4 ISM Code safety management system and quality procedures (where existing) b.5 managing machinery and equipment security procedures and housekeeping processes b.6 managing waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB10 01A TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL MACHINERY AND ELECTRICAL AND ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required by an Engineer (Class 1) to test, detect faults and maintain and restore electrical / electronic control equipment to operating condition on a commercial vessel powered by main propulsion machinery of unlimited propulsion power. This includes the management and coordination of relevant maintenance and fault-finding activities and the application of advanced diagnostic and problem solving techniques to maintenance procedures

The unit is consistent with the related functional standard in Section A III/2 of the STCW Code and AMSA Marine Orders Part 3, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage the detection, identification and investigation of electrical machinery and electronic equipment malfunctions and faults</p>	<ul style="list-style-type: none"> a. The detection, identification and investigation of malfunctions and faults in shipboard electrical machinery and electronic equipment is coordinated and managed in accordance with the responsibilities of an Engineer (Class 1) b. The operation of shipboard electrical machinery and electronic equipment is monitored in accordance with vessel's survey requirements, planned maintenance requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance c. Out of specification performance and faults are identified in accordance with marine engineering practice d. Advanced diagnostic techniques are used to investigate poor performance and faults and appropriate action is initiated to rectify the identified problems in accordance with the responsibilities of an Engineer (Class 1) e. Appropriate action is taken to prevent damage/failure in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions f. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with company procedures and established marine engineering practice g. Decisions made to carry out temporary or permanent repairs depending on the vessel's position and circumstances h. Appropriate consultation taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required i. Management of the repair processes and the organisation and control of engine room personnel to facilitate repairs is in accordance with company procedures and established marine engineering practice

<p>2. Repair faults in electrical machinery and electronic equipment</p>	<ul style="list-style-type: none"> a. Identified faults in shipboard electrical and electronic equipment are investigated using established fault-finding techniques in accordance with the responsibilities of an Engineer (First Class) b. Malfunctioning or faulty electrical and electronic equipment is correctly isolated, disassembled, if necessary, in accordance with manufacturer's instructions and established marine engineering practice c. Damaged or faulty components are repaired or replaced in accordance with company planned maintenance system procedures, manufacturer's instructions and established marine engineering practice d. Repaired electrical and electronic equipment is re-assembled in accordance with manufacturer's instructions and established marine engineering practice e. Repaired electrical and electronic equipment is tested and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel f. Repaired electrical and electronic equipment and associated safety devices, control systems and alarms are re-started/re-activated and their performance tested in accordance with manufacturer's instructions g. Tests are conducted to the requirements of class and statutory surveys h. Performance against recommended performance specifications is confirmed and the electrical and electronic equipment is re-commissioned in accordance with vessel's procedures and established marine electrical / electronic practice
<p>3. Complete maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to maintenance and repair operations and equipment failure incidents b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations
<p>4. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Tests, inspections and repairs of vessel electrical and electronic equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations d. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed e. Action is taken in the event of a electrical and electronic equipment failure or emergency to isolate and secure the electrical and electronic equipment and the vessel and maintain the safety of the vessel and persons involved f. Shipboard emergency and contingency plans followed in the event of a electrical and electronic equipment failure or emergency

Range Of Variables

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice and advanced diagnostic techniques to the repair of electrical and electronic control equipment typically found on a vessel of unlimited propulsion power across a wide and often unpredictable variety of equipment malfunctions or faults. Contribution to the development and implementation of a broad plan or strategy for the maintenance and repair of shipboard electrical and electronic control equipment is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to electrical and electronic equipment repair operations and procedures. This includes management training and control of personnel, hazard minimisation, analysis of situations and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Shipboard electrical and electronic control equipment may include that typically found on any Australian or international commercial vessel of unlimited propulsion power b. Performance monitoring and repair of shipboard electrical and electronic control equipment may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of electrical and electronic control equipment may include: <ul style="list-style-type: none"> c.1. programmable logic controllers (PLCs) c.2. signal transmission systems used for monitoring and control c.3. temperature and pressure sensors c.4. electronic PID controllers c.5. analog to digital converters c.6. electrical and electronic equipment space monitoring alarm and control systems c.7. a.c. generators c.8. a.c. and d.c. motors, including: <ul style="list-style-type: none"> c.8.1. three phase induction motors such as squirrel cage, double cage, wound rotor and slip ring, TEFC, splash proof and submersible c.8.2. three phase synchronous motors c.9. three phase alternators c.10. three phase transformers c.11. electronic instrumentation and power supply circuits c.12. main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> c.12.1. distribution circuits and wiring c.12.2. protection devices c.12.3. circuit breakers c.13. emergency supply systems including emergency generators, emergency switchboard and battery banks c.14. electronic governors c.15. deck electrical machinery

Range Of Variables (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> d. Testing and repair equipment may include: <ul style="list-style-type: none"> d.1. electronic instrumentation meters and gauges, oxygen meter and gas detectors d.2. CRO and computer displays of performance parameters d.3. hand tools, such as soldering irons, pliers, cutters, wire-strippers, spanners, wrenches, screwdrivers, hacksaws, etc. d.4. electric power tools, such as grinders, lathes, drills, etc. d.5. pneumatic power tools, such as grinders, sanders, drills, etc. d.6. block and tackle d.7. portable and manual lifting equipment and hydraulic jacks d.8. material safety data sheets d.9. protective clothing and equipment such as: <ul style="list-style-type: none"> d.9.1. eye and ear protection d.9.2. safety boots d.9.3. dust and fume masks d.9.4. boilersuit/overalls d.9.5. safety helmet e. Maintenance and repair hazards may include: <ul style="list-style-type: none"> e.1. exposed live circuits e.2. faulty earth connections e.3. moving heavy loads in an unsafe work environment e.4. unsecured electrical and electronic equipment, components or repair equipment e.5. sharp tools and implements e.6. power tools e.7. moving and rotating electrical and electronic equipment e.8. faulty equipment, handling equipment and lifting gear e.9. using equipment beyond safe working limits e.10. poor housekeeping procedures e.11. non-compliance with safe working procedures e.12. electrical wiring and systems e.13. hot pipes and valves (steam, fuel oil, lubricating oil) e.14. cold pipes and valves (refrigeration and liquefied gas cargoes) e.15. working at heights e.16. overspeed of electrical machinery, emergency trips e.17. noxious and dangerous cargoes f. Emergencies may include: <ul style="list-style-type: none"> f.1. loss of electrical power f.2. short circuits and open-circuits in distribution systems f.3. loss of electronic / electrical control of systems f.4. flooding of engine room f.5. fire or explosion in engine room f.6. failure of emergency alarm and control systems f.7. loss of refrigeration f.8. overloading of electrical systems

Range Of Variables (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. electrical and electronic equipment maintenance log, running sheets and records a.5. computer database of running information and maintenance records a.6. vessel's survey procedures and instructions as they relates to shipboard electrical and electronic equipment a.7. vessel's safety and emergency contingency plans and procedures a.8. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.9. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard electrical and electronic equipment maintenance and repair a.10. instructions of relevant Maritime Authorities and class societies concerning shipboard electrical and electronic equipment maintenance and repair
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard electrical and electronic equipment maintenance and repair on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory electrical and electronic engineering practice standards

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage maintenance activities at the level of responsibility of an Engineer (Class 1) a.2. Monitor the performance of shipboard electrical and electronic equipment against specifications on a vessel of unlimited propulsion power a.3. Identify malfunctioning and faulty electrical and electronic equipment and components and initiate appropriate action for repair or replacement a.4. Apply advanced diagnostic techniques to the trouble-shooting of malfunctioning and faulty electrical and electronic equipment and carry out required repairs in accordance with established marine engineering practice and at the level of responsibility of an Engineer (Class 1) a.5. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation, maintenance and repair of shipboard electrical and electronic equipment a.6. Identify typical electrical and electronic equipment maintenance and repair problems and hazards and take appropriate action a.7. Communicate effectively with others during maintenance and repair operations including effective use of internal communication systems a.8. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the management of shipboard electrical and electronic equipment maintenance and repair operations on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the checking, maintenance and repair of marine electrical and electronic equipment, systems and equipment d. Operational characteristics and performance specifications for the different types of shipboard electrical and electronic equipment usually found on a vessel of unlimited propulsion power e. Advanced diagnostic techniques for carrying out testing, trouble-shooting and repair of shipboard electrical and electronic equipment as part of maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations f. Procedures for coordinating the overall management of planned maintenance systems and procedures for the condition monitoring of electrical and electronic equipment, including responsibilities and requirements covered by various forms of vessel survey g. The nature and causes of typical shipboard electrical and electronic equipment malfunctions and the available methods for their detection and repair, including marine electrical and electronic equipment malfunction fault-finding techniques h. Advanced diagnostic and repair techniques for carrying out shipboard electrical and electronic equipment testing, trouble-shooting and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations i. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures for electrical and electronic equipment on board vessels at sea, alongside and in dry dock j. Theory, calculations, practical characteristics and applications of shipboard electrical machines at the level at required by an Engineer (Class 1), including: <ul style="list-style-type: none"> j.1. a.c. and d.c. motors j.2. a.c. generators including requirements for the parallel operation and the process of synchronisation j.3. three phase induction motors including the various starting methods j.4. three phase motors j.5. three phase synchronous motors j.6. three phase alternators operating singly and in parallel j.7. three phase transformers

Evidence Guide (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

3. Required knowledge and skills
(continued)
- k. An understanding of the power distribution and control circuits typically used onboard a vessel of unlimited propulsion power and their associated operational electrical and electronic equipment
 - l. Concepts of Unmanned Machinery Spaces (UMS) and automated monitoring and control of machinery
 - m. Principles and techniques for finding faults in shipboard control systems
 - n. Procedures for the calibration and adjustment of transmitters and controllers in control systems
 - o. Elementary programming and program modification for programmable logic controllers (PLCs), including principles and applications
 - p. Common active devices and their application in power electronic and electronic circuits typically used on a vessels of 3,000kW propulsion power or more, including:
 - p.1. ability to identify the devices and their circuit symbols
 - p.2. operating characteristics of common active devices
 - p.3. applications of common active devices
 - q. Common integrated circuit devices and their application in shipboard electronic instrumentation and power supply circuits, including:
 - q.1. operational amplifiers
 - q.2. voltage regulators
 - q.3. multivibrators
 - r. Common digital electronic circuits and their application in shipboard electronic instrumentation systems, including:
 - r.1. digital integrated circuits
 - r.2. analog to digital converters
 - r.3. microprocessors
 - r.4. digital communication bus transmission system using optical and electronic sub-systems
 - s. Principles and procedures for electrical and electronic measurement, including the use of oscilloscopes and multimeters and insulation resistance measurement using a Megger
 - t. Knowledge and ability to read and interpret electrical and electronic equipment performance readings and instrumentation
 - u. Procedures for diagnosing and repairing faults in 4 to 20 mA loops including:
 - u.1. open and short circuits
 - u.2. earth faults
 - u.3. high resistance joints
 - u.4. power supply faults
 - u.5. electronic component failure
 - v. Principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including:
 - v.1. electromagnetism and electrostatics
 - v.2. electrolytic action and cells
 - v.3. the electric circuit
 - v.4. theory and calculations of AC and DC machines and related electrical and electronic control equipment
 - v.5. cabling, distribution and lighting systems
 - v.6. control and switch gear
 - v.7. deck electrical and electronic equipment
 - v.8. theory and setting/tuning of 2 and 3 term controllers, including microprocessors
 - v.9. principles, calculations and diagnostics for shipboard electronic components and systems, including:
 - v.9.1. electronics principles
 - v.9.2. integrated circuits, microprocessors and PLCs
 - v.9.3. process control theory
 - v.9.4. instruments, calibration and testing
 - v.9.5. electronic control, surveillance, measurement and recording systems
 - v.9.6. telemetering devices
 - v.9.7. alarm systems, including fire and emergency alarm systems
 - v.9.8. main and auxiliary electrical and electronic equipment control and UMS

Evidence Guide (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> w. Maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities x. Maritime communication techniques needed during maintenance and repair operations y. Knowledge and ability to read and interpret material safety data sheets z. Knowledge and ability to read and interpret vessel and electrical and electronic equipment specifications, equipment drawings, operational manuals, and electrical and control circuit diagrams aa. Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions during maintenance and repair of shipboard electrical and electronic equipment bb. Safety, environmental and hazard control precautions and procedures relevant to shipboard electrical and electronic equipment inspection and maintenance operations cc. Safe procedures for the use of hand and power tools and maintenance equipment and for the handling heavy electrical and electronic equipment and component parts during maintenance and repair of shipboard electrical and electronic equipment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated fault situations and other assessments that demonstrate the skills and knowledge to check and repair electrical and electronic equipment typically found on a vessel of unlimited propulsion power, including the ability to identify an appropriate range of possible electrical and electronic equipment malfunctions and carry out related maintenance and repair solutions; and/or b. Carrying out checks and related repairs of shipboard electrical and electronic equipment in a range of operational situations on a commercial or training vessel of unlimited propulsion power
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 assessing operational performance of shipboard electrical and electronic equipment a.2 identifying shipboard electrical and electronic equipment malfunctions and faulty plant and equipment of a vessel of unlimited propulsion power a.3 taking action to minimise any damage and safety risk that could be caused by electrical and electronic equipment malfunctions a.4 managing, training and controlling personnel and carrying out repairs of shipboard electrical and electronic equipment a.5 identifying and evaluating electrical and electronic equipment maintenance and repair problems and determining an appropriate courses of action a.6 identifying and implementing improvements to electrical and electronic equipment checking, maintenance and repair procedures a.7 applying safety precautions relevant to electrical and electronic equipment maintenance and repair operations a.8 completing maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures, quality procedures and work instructions on the checking and repair of shipboard electrical and electronic equipment, including electrical and electronic equipment specifications and directions on equipment capability and limitations b.4 following on-board housekeeping processes c. Action taken promptly to report and/or rectify electrical and electronic equipment malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail

Evidence Guide (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OF UNLIMITED PROPULSION POWER

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB12 01A FAULT-FIND, DISMANTLE, MAINTAIN AND REPAIR SHIPBOARD PLANT AND EQUIPMENT

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required by to fault-find, dismantle, maintain, repair and reassemble shipboard plant and equipment on a commercial vessel of unlimited propulsion power using hand and power tools and appropriate test equipment. This includes working with a senior engineer in fault finding and in the dismantling, maintenance and repair of shipboard plant and equipment.

The unit is consistent with the related functional standard in Section A III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
1. Detect, identify and investigate plant and equipment malfunctions and faults	<ul style="list-style-type: none"> a. The operation of shipboard plant and equipment is monitored in accordance with vessel's survey requirements, standard procedures, chief engineer's instructions and manufacturer's instructions b. Performance shipboard plant and equipment is compared with specifications and recommended limits of performance c. Out of specification performance and faults are identified in accordance with marine engineering practice and plant and equipment specifications d. Out of specification performance and faults are investigated in accordance with marine engineering practice and manufacturer's instructions and appropriate action initiated to rectify the identified problem in consultation with the responsible engineer e. Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions f. Faulty equipment and components are identified and reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with company procedures and established marine engineering practice g. In consultation with a senior engineer, decisions are made to carry out temporary or permanent repairs depending on the vessel's position and circumstances in accordance with established marine engineering practice h. Appropriate consultation taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required

3. Disassemble and repair faulty plant and equipment	<ul style="list-style-type: none"> a. Identified faults in shipboard plant and equipment are investigated using established fault-finding techniques b. In consultation with a senior engineer where necessary, malfunctioning or faulty plant and equipment is correctly isolated and disassembled, if necessary, in accordance with manufacturer's instructions and established marine engineering practice c. Appropriate procedures are selected for the repair of plant, equipment or components in accordance with manufacturer's manuals and instructions and established engineering practice d. In consultation with a senior engineer, damaged or faulty components are repaired or replaced in accordance with company planned maintenance system or procedures, manufacturer's instructions and established marine engineering practice e. Repaired plant and equipment is re-assembled in accordance with manufacturer's instructions and established marine engineering practice f. Repaired plant and equipment is tested and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel g. Repaired plant and equipment and associated safety devices, control systems and alarms are re-started / re-activated and their performance tested in accordance with manufacturer's manuals and instructions and established engineering practice h. Tests are conducted to survey, class and manufacturers' requirements i. Performance against recommended performance specifications is confirmed and the plant and equipment is re-commissioned in accordance with vessel's procedures and established marine electrical / electronic marine practice
4. Complete maintenance and repair documentation	<ul style="list-style-type: none"> a. In consultation with the senior engineer, correct records are kept concerning plant and equipment malfunctions and fault-finding, maintenance and repair operations b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations
5. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Fault-finding, dismantling and repairs of plant and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations d. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed in consultation with the responsible engineer e. Action is taken in the event of a plant and equipment failure or emergency to isolate and secure the plant and equipment and the vessel and maintain the safety of the vessel and persons involved f. Shipboard emergency and contingency plans followed in the event of a plant and equipment failure or emergency

Range Of Variables

FAULT-FIND, DISMANTLE, MAINTAIN AND REPAIR SHIPBOARD PLANT AND EQUIPMENT

VARIABLE	SCOPE
<p>1. General context</p>	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and to ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently within an established maintenance plan and in consultation with a senior engineer, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice to the repair of plant and control equipment typically found on vessels of unlimited propulsion power across a wide and often unpredictable variety of equipment malfunctions or faults. Following of an established plan or strategy for the maintenance and repair of shipboard plant and control equipment is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires some judgement in engineering functions related to plant and equipment maintenance and repair operations and procedures. This includes working with a senior engineer in fault finding and in the dismantling, maintenance and repair of shipboard plant and equipment.
<p>2. Worksite environment</p>	<ul style="list-style-type: none"> a. Shipboard plant and control equipment may include that typically found on any Australian or international commercial vessels of unlimited propulsion power. b. Performance monitoring and repair of shipboard plant and control equipment may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of plant and equipment may include: <ul style="list-style-type: none"> c.1. steam, diesel, diesel electric and gas turbine propulsion systems and controls c.2. electrical systems and controls, including primemovers c.3. batteries, transformers, switchboard, distributions systems, lighting systems c.4. steering gear, stabilizers, bow thrusters, rudders c.5. fluid power systems and controls c.6. deck machinery, including cranes and winches c.7. pumps and pumping systems c.8. emergency supply systems including emergency generators and battery banks c.9. auxiliary systems and controls, including <ul style="list-style-type: none"> c.9.1. fresh and salt water cooling systems c.9.2. lubricating oil cooling systems c.9.3. fuel, oil, gas, coal systems and centrifuges c.9.4. compressed air and air starting systems c.9.5. lubrication c.9.6. bilge and ballast system, oily water separator c.9.7. refrigeration and air-conditioning plant and equipment c.9.8. onboard air compressors and compressed air and control air systems c.9.9. waste management and pollution control systems as per the MARPOL Convention c.9.10. evaporators c.9.11. inert gas generator c.9.12. cargo pumps, tank washing machines and associated systems c.9.13. purifiers and clarifiers c.9.14. heaters c.9.15. sewage plant c.9.16. fixed fire fighting installations and fire control systems c.9.17. auxiliary boilers and waste heat generators c.9.18. life saving appliances c.9.19. maintenance to hull and vessel side valves

Range Of Variables (continued)

FAULT-FIND, DISMANTLE, MAINTAIN AND REPAIR SHIPBOARD PLANT AND EQUIPMENT

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>d. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> d.1. electronic instrumentation, meters and gauges d.2. computer displays of performance parameters d.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, soldering irons, pliers, cutters, wire-strippers, etc. d.4. greasing and lubrication tools d.5. electric power tools, such as grinders, lathes, drills, etc. d.6. pneumatic power tools, such as grinders, sanders, drills, etc. d.7. welding equipment d.8. block and tackle d.9. portable and manual lifting equipment and hydraulic jacks d.10. material safety data sheets d.11. protective clothing and equipment such as: <ul style="list-style-type: none"> d.11.1. eye and ear protection d.11.2. safety boots d.11.3. dust and fume masks <p>e. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> e.1. moving heavy loads in an unsafe work environment e.2. unsecure plant and equipment, components or repair equipment e.3. sharp tools and implements e.4. power tools e.5. moving and rotating plant and equipment e.6. faulty equipment, handling equipment and lifting gear e.7. using equipment beyond safe working limits e.8. poor housekeeping procedures e.9. non-compliance with safe working procedures e.10. electrical wiring and systems e.11. exposed live circuits e.12. faulty earth connections e.13. hot pipes and valves (steam, fuel oil, lubricating oil) e.14. cold pipes and valves (refrigeration and liquefied gas cargoes) e.15. working at heights e.16. exposed live circuits e.17. faulty earth connections <p>f. Emergencies may include:</p> <ul style="list-style-type: none"> f.1. loss of propulsion f.2. loss of electrical power f.3. loss of steerage f.4. flooding of engine room f.5. fire or explosion in engine room f.6. loss of refrigeration f.7. loss of water making ability f.8. fuel oil, lubrication oil, steam and gas leaks f.9. overheating and overspeed of machinery, governors, emergency trips
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. plant and equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. plant and equipment maintenance log, running sheets and records, including computer database of running information and maintenance records, where relevant a.5. vessel's survey as it relates to shipboard plant and equipment a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard plant and equipment maintenance and repair a.7. instructions of relevant Maritime Authorities and class societies concerning shipboard plant and equipment maintenance and repair

Range Of Variables (continued)

FAULT-FIND, DISMANTLE, MAINTAIN AND REPAIR SHIPBOARD PLANT AND EQUIPMENT

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard plant and equipment maintenance and repair on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

FAULT-FIND, DISMANTLE, MAINTAIN AND REPAIR SHIPBOARD PLANT AND EQUIPMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Fault-find, dismantle, maintain and repair shipboard plant and equipment against specifications on a vessel of unlimited propulsion power a.2. Identify malfunctioning and faulty plant and equipment and components and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when carrying out fault-finding, dismantling, maintenance and repair operations on shipboard plant and equipment a.4. Identify typical plant and equipment maintenance and repair problems and hazards and take appropriate action a.5. Communicate effectively with others during maintenance and repair operations a.6. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an officer in charge of an engineering watch on a vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the management of shipboard plant and equipment maintenance and repair operations on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the fault-finding, dismantling, maintenance and repair of marine electrical and equipment d. Operational characteristics and performance specifications for the different types of shipboard plant and equipment usually found on a vessel of unlimited propulsion power e. Planned maintenance systems and procedures for the condition monitoring of plant and equipment, including responsibilities and requirements covered by various forms of vessel survey f. The nature and causes of typical shipboard plant and equipment malfunctions and the available methods for their detection and repair, including established fault-finding techniques g. Procedures for carrying out shipboard plant and equipment fault-finding and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations h. Procedures for the completion of temporary and permanent repair and/or replacement procedures for plant and equipment on board vessels at sea, alongside and in dry dock i. A basic understanding of the plant and equipment typically found onboard a vessel of unlimited propulsion power j. Concepts of Unattended Machinery Spaces (UMSs) and automated monitoring and control of machinery k. Knowledge and ability to read and interpret plant and equipment performance readings and instrumentation l. Basic principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery m. Basic principles of operation and maintenance of: <ul style="list-style-type: none"> m.1. fluid power control systems m.2. air-conditioning and refrigeration systems m.3. machinery lubrication systems n. Knowledge and ability to read and interpret material safety data sheets o. Knowledge and ability to read and interpret vessel and plant and equipment specifications, equipment drawings, operational manuals, and electrical and control circuit diagrams p. Types of maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities q. Maritime communication techniques needed during maintenance and repair operations

Evidence Guide (continued)

FAULT-FIND, DISMANTLE, MAINTAIN AND REPAIR SHIPBOARD PLANT AND EQUIPMENT

3. Required knowledge and skills
(continued)
- r. Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions during maintenance and repair of shipboard plant and equipment
 - s. Safety, environmental and hazard control precautions and procedures relevant to shipboard plant and equipment inspection and maintenance operations
 - t. Safe procedures for handling heavy plant and equipment and component parts during maintenance and repair of shipboard plant and equipment
 - u. Safe procedures for the use of hand and power tools and maintenance equipment
 - v. Basic principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, fault-finding and repair of faults in electrical and electronic equipment, including:
 - v.1. basic electrical circuit theory
 - v.2. basic theory of electromagnetism and electrostatics
 - v.3. electrolytic action and cells
 - v.4. AC and DC theory and plant and equipment
 - v.5. basic cabling, distribution and lighting systems
 - v.6. basic control and switch gear
 - v.7. instruments, calibration and testing
 - w. Basic principles of diesel engine operation to a level suitable for an officer of an engineering watch, including:
 - w.1. typical starting air and manoeuvring systems of diesel engines, including all components normally found therein.
 - w.1.1. starting methods of marine diesel engines and how propulsion manoeuvring is achieved
 - w.1.2. requirements for diesel engines for propulsion, power generation, and emergency use.
 - w.1.3. methods of reversing direct reversing engines with their interlocks and other safety arrangements.
 - w.1.4. common faults and appropriate action to be taken with starting/manoeuvring systems.
 - w.2. typical diesel engine lubrication systems, including
 - w.2.1. all components normally found therein
 - w.2.2. normal operational pressures and temperatures which should be expected.
 - w.2.3. methods of lubricating the principle components of a marine diesel engine, with its associated gearing and/or chain drives, including common lubrication faults, symptoms, causes, and actions to be taken with such faults.
 - w.3. the operating principles and adjustments of diesel engine fuel injection equipment, including common service faults, symptoms, and causes of diesel fuel injection problems, explaining appropriate actions to be taken.
 - w.4. means of pressure charging diesel engines including common service faults, appropriate actions to rectify these faults, and emergency operation and isolation procedures.
 - w.5. different methods of cooling marine diesel engines, including common requirements of cooling.
 - w.6. common faults and appropriate action to be taken with cooling of diesel engines.
 - w.7. the causes of crankcase and airline explosions, scavenge and uptake fires.
 - x. Basic thermodynamics as it relates to the responsibilities of an officer in charge of an engineering watch, including:
 - x.1. basic thermodynamic properties of common working fluids.
 - x.2. methods of heat transfer and related problems
 - x.3. principles of heat transfer by conduction, convection and radiation and their application to marine systems
 - x.4. elementary principles of steam plants
 - x.5. basic steam plant cycles and explain the function of each component
 - x.6. the combustion process and the calorific value of fuels
 - x.7. air/fuel ratio and the significance of excess air on combustion
 - x.8. the operating cycle of single stage reciprocating air conditioners including methods for calculating the mass of air delivered
 - x.9. clearance volume, its effect on volumetric efficiency and methods of calculating the volumetric efficiency
 - x.10. advantages of multistaging and intercooling
 - x.11. meaning of gauge and absolute pressure
 - x.12. temperature and temperature scales
 - x.13. SYSTEM INTERNATIONAL (SI) units and common thermodynamic terms and principles.

Evidence Guide (continued)

FAULT-FIND, DISMANTLE, MAINTAIN AND REPAIR SHIPBOARD PLANT AND EQUIPMENT

3. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated fault situations and other assessments that demonstrate the skills and knowledge to fault-find, dismantle, maintain and repair plant and equipment typically found on a vessel of unlimited propulsion power; and/or b. Fault-find, dismantle, maintain and repair shipboard plant and equipment on a commercial or training vessel of unlimited propulsion power
4. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 assessing operational performance of shipboard plant and equipment a.2 identifying shipboard plant and equipment malfunctions and faulty plant and equipment of a vessel of unlimited propulsion power a.3 taking action to minimise any damage and safety risk that could be caused by plant and equipment malfunctions a.4 fault-finding, dismantling, maintaining and repairing shipboard plant and equipment a.5 identifying plant and equipment maintenance and repair problems and determining an appropriate courses of action a.6 applying safety precautions relevant to plant and equipment maintenance and repair operations a.7 completing maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures, quality procedures and work instructions on the fault-finding, dismantling, maintenance and repair of shipboard plant and equipment, including plant and equipment specifications and directions on equipment maintenance b.4 following on-board housekeeping processes c. Action is taken promptly to report and/or rectify plant and equipment malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
5. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	3	2	3	3

TDM MB13 01A CARRY OUT SHIPBOARD FABRICATION AND REPAIR OPERATIONS

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to carry out shipboard fabrication and repair operations on a commercial vessel of unlimited propulsion power. This includes working with a senior engineer on the analysis of fabrication and repair requirements and carrying out established engineering fabrication and repair tasks.

The unit is consistent with the related functional standard in Section A III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Detect, identify and investigate faulty and deteriorated structures and components</p>	<ul style="list-style-type: none"> a. Inspections of vessel structures and components are carried out in accordance with vessel's survey requirements and manufacturer's instructions and specifications b. Damaged, faulty or deteriorated structures and components are investigated in accordance with marine engineering practice and manufacturer's instructions and appropriate action is initiated to rectify the identified problem c. Damaged or faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and fabrication, repair or replacement in accordance with company procedures and established marine engineering practice d. Appropriate action is taken in consultation with the responsible engineer to prevent further damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions e. Decisions are made in consultation with the senior engineer to carry out temporary or permanent repairs depending on the vessel's position and circumstances f. Appropriate consultation is undertaken with class society and marine administration concerning the nature of the fabrication and repairs and any contingency or emergency action required g. Organisation and control of engine room personnel to facilitate fabrication and repairs is in accordance with company procedures and established marine engineering practice
<p>2. Fabricate and repair faulty and deteriorated structures and components</p>	<ul style="list-style-type: none"> a. In consultation with the responsible engineer, a plan for the fabrication and repair of damaged, faulty or deteriorated vessel structures and components is established in accordance with company planned maintenance system or procedures, manufacturer's instructions and established marine engineering practice b. Required tools and materials to carry out the fabrication and repair tasks are selected and obtained in accordance with vessel's procedures c. Appropriate personnel are given timely advice of the fabrication and repair activities d. Where relevant, the repair area is isolated and safety and warning signs are erected prior to commencing fabrication and repair activities in accordance with safety regulations and vessel's procedures e. Fabrication and repair of damaged, faulty or deteriorated vessel structures and components are carried out in consultation with the responsible engineer using appropriate tools and materials in accordance with manufacturer's instructions and established marine engineering practice f. Repaired structures and components are checked against specifications in accordance with vessel's survey and regulatory requirements and manufacturer's instructions and specifications

<p>3. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Fabrication and repairs of vessel structures, components and fittings are conducted in accordance with safety regulations and company procedures in consultation with the responsible engineer b. Fabrication and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Personal protection clothing and equipment are used in accordance with safety regulations and established engineering practice d. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during fabrication and repair operations e. In consultation with a senior engineer, where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed f. Action is taken in the event of a serious failure or deterioration of the vessel's structures or components to secure the structures and the vessel, and maintain the safety of the vessel and persons involved g. Vessel's emergency and contingency plans are correctly followed In the event of a serious failure or deterioration of the vessel's structures or components
<p>4. Complete maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are kept concerning any identified structural or component faults or deterioration and related fabrication and repair operations b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations

Range Of Variables

CARRY OUT SHIPBOARD FABRICATION AND REPAIR OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and to ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently in consultation with a senior engineer under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice to the fabrication and repair of structures and components typically found on a vessel of unlimited propulsion power. Implementation of a broad plan or strategy for shipboard maintenance and repair is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires some judgement in engineering functions related to fabrication and repair operations and procedures. This includes working with a senior engineer on the analysis of fabrication and repair requirements and carrying out established engineering fabrication and repair tasks.
2. Worksite environment	<ul style="list-style-type: none"> a. Structures and components to be fabricated or repaired may include those typically found on any Australian or international commercial vessel of unlimited propulsion power b. Fabrication and repair activities may include: <ul style="list-style-type: none"> b.1. routine maintenance inspections of vessel's structures, components and fittings b.2. identification of any deterioration of a vessel's structure, fittings and components b.3. identification of faulty structures or fittings and arranging for repair or replacement b.4. fabrication of metal and wooden structures and components to specification b.5. preparation of marine surfaces prior to the application of the prescribed marine coating b.6. selection and application of appropriate marine preservatives or finishes for particular surfaces c. Damage or deterioration of vessel's structure, components and fittings may include: <ul style="list-style-type: none"> c.1. corrosion to structures, components, hull fittings and equipment c.2. damage caused through an accident c.3. deterioration caused by wear or metal fatigue d. Maintenance tools and equipment may include: <ul style="list-style-type: none"> d.1. hand tools, including spanners, wrenches, screwdrivers, hacksaws, chipping hammers and scrapers, etc. d.2. electric power tools such as grinders, sanders and drills, d.3. welding equipment d.4. milling machines, bench drills and lathes d.5. pneumatic power tools such as grinders, sanders and drills d.6. marine preservative finish application equipment such as brushes, spay guns, rollers d.7. greasing and lubrication tools d.8. rinsing and storage equipment d.9. protective clothing and equipment such as: <ul style="list-style-type: none"> d.9.1. eye and ear protection d.9.2. safety boots and helmet d.9.3. dust and fume masks e. Fabrication and repair hazards may include: <ul style="list-style-type: none"> e.1. moving heavy loads using unsafe lifting procedures e.2. unsecure machinery, components or repair equipment e.3. slippery deck e.4. welding equipment e.5. sharp tools and implements e.6. power tools e.7. moving and rotating machinery e.8. flammable liquids, vapours and fuel e.9. faulty machinery equipment handling equipment and lifting gear e.10. using equipment beyond safe working limits e.11. poor housekeeping procedures e.12. non-compliance with safe working procedures e.13. electrical wiring and systems e.14. hot pipes and valves (steam, fuel oil, lubricating oil) e.15. cold pipes and valves (refrigeration and liquefied gas cargoes) e.16. working at heights and in confined spaces

Range Of Variables (continued)

CARRY OUT SHIPBOARD FABRICATION AND REPAIR OPERATIONS

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.4. maintenance log, running sheets and records, including computer database of maintenance records, where relevant a.5. vessel's survey as it relates to shipboard structures and components a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard maintenance and repair a.7. instructions of relevant Maritime Authorities and class societies concerning shipboard maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard maintenance and repair on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

CARRY OUT SHIPBOARD FABRICATION AND REPAIR OPERATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Inspect shipboard structures and components for damage, faults and deterioration against specifications on a vessel of unlimited propulsion power a.2. Identify damaged, faulty, worn and deteriorated structures and components and in consultation with the responsible engineer, initiate appropriate action for repair or replacement a.3. Plan and carry out required fabrication and repairs in consultation with the senior engineer in accordance with established marine engineering practice a.4. Exercise all required safety, environmental and hazard control precautions and procedures when carrying out fabrication and repair activities a.5. Identify typical maintenance and repair problems and hazards and take appropriate action a.6. Communicate effectively with others during fabrication and repair operations a.7. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other engineering maintenance competency units that form part of a job role of an officer in charge of an engineering watch on a commercial vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to maintenance and repair operations on vessels of unlimited propulsion power b. Relevant OH&S and pollution control legislation, policies and procedures c. Established engineering practice for the checking, fabrication and repair of marine structures, components, fittings and equipment d. Operational characteristics and performance specifications for the different types of shipboard machinery usually found on a vessel of unlimited propulsion power e. Procedures for carrying out shipboard machinery testing, trouble-shooting and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations f. Planned maintenance systems and procedures for the condition monitoring of structures, fittings and components, including responsibilities and requirements covered by various forms of vessel survey g. The nature and causes of typical deterioration and damage to vessel structures, components and fittings and the available methods for its detection and related fabrication and repair h. Fabrication and repair hazards and problems and appropriate preventative and remedial action and solutions i. Safe procedures for handling heavy structures and component parts during fabrication and repair j. Safe procedures for the use of hand and power tools, welding and other maintenance equipment during maintenance and repair of shipboard structures, components and fittings k. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock l. Safety, environmental and hazard control precautions and procedures relevant to shipboard inspection and maintenance operations m. Principle features of vessel construction including the layouts and the structural strength of different types of vessels n. A basic understanding of the properties and application of materials and structures typically used in the construction of a vessel of unlimited propulsion power and its associated operational machinery o. Maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities p. Maritime communication techniques needed during maintenance and repair operations q. Knowledge and ability to read and interpret material safety data sheets r. Knowledge and ability to read and interpret machinery performance readings and indications s. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams

Evidence Guide (continued)

CARRY OUT SHIPBOARD FABRICATION AND REPAIR OPERATIONS

3. Required knowledge and skills
(continued)
- t. A basic understanding of the components and materials used within various types of vessel's equipment, including:
 - t.1. pumps and pumping systems
 - t.2. heat exchangers
 - t.3. valves and safety fittings
 - t.4. marine air compressors
 - t.5. refrigeration and air conditioning plants
 - t.6. transmission systems including design, manufacture and materials of gear teeth
 - t.7. auxiliary boilers and waste heat units
 - t.8. feed systems for boilers
 - t.9. auxiliary steam turbines
 - t.10. construction of diesel engines including the materials used
 - t.11. fuel pumps used in diesel engines
 - u. Basic principles of mechanics as they relate to fabrication and repair activities, including.
 - u.1. stress and strain caused by axial loads
 - u.2. mechanical advantage, velocity ratio and efficiency of lifting and geared marine machinery
 - u.3. effects on stress and stability caused by a change or shift in the mass in a vessel
 - u.4. statics. force as a vector. triangle and polygon of forces. the principle of moments, application to simply supported beams and cranked levers. moments of force. couples. centroids and centres of gravity limited to geometrical shapes. resultant and equilibrant of a system of concurrent coplanar forces.
 - u.5. laws of friction for dry surfaces, coefficient of friction (horizontal plane only), lubrication of bearings and plain surfaces.
 - u.6. linear displacement, time speed, velocity and acceleration. angular motion.
 - u.7. problems with constant force or force with linear variation. torque, work, energy, power. conservation of energy. potential and kinematic energy. Newton's laws of motion. momentum, rate of change of momentum. centrifugal force.
 - u.8. simple lifting machines, graphs of load-effort and load-efficiency, linear law., velocity ratio
 - u.9. mechanical advantage and efficiency of the following machines: wheel and axle, differential pulley blocks, screw jack, Warwick screw, hydraulic jack, worm driven chain blocks and single and double purchase crab winches. reduction gearing.
 - u.10. direct stress and strain, Hooke's law, modulus of elasticity, elastic limit, ultimate tensile strength, yield stress, limit of proportionality, safety factor, shear stress.
 - u.11. circumferential and longitudinal stress in thin cylindrical and spherical shells subject to internal pressure.
 - v. Elementary principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:
 - v.1. basic thermodynamic properties of common working fluids.
 - v.2. methods of heat transfer and related problems
 - v.3. principles of heat transfer by conduction, convection and radiation and their application to marine systems
 - v.4. elementary principles of steam plants
 - v.5. saturated dry and wet steam, dryness fraction, superheated steam, enthalpy, steam tables. Evaporation.
 - v.6. basic steam plant cycles and explain the function of each component
 - v.7. the combustion process and the calorific value of fuels
 - v.8. AIR/FUEL ratio and the significance of excess air on combustion
 - v.9. the operating cycle of single stage reciprocating air conditioners including methods for calculating the mass of air delivered
 - v.10. clearance volume, its effect on volumetric efficiency and methods of calculating the volumetric efficiency
 - v.11. advantages of multistaging and intercooling
 - v.12. meaning of gauge and absolute pressure
 - v.13. temperature and temperature scales
 - v.14. SYSTEM INTERNATIONAL (SI) units and common thermodynamic terms and principles.
 - v.15. gases and gas cycles
 - v.16. boilers and evaporators
 - v.17. refrigeration and air conditioning
 - v.18. the use and advantages of insulation

Evidence Guide (continued)

CARRY OUT SHIPBOARD FABRICATION AND REPAIR OPERATIONS

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to fabricate and repair structures, components and fittings typically found on a vessel of unlimited propulsion power; and/or b. Fabricate and repair structures, components and fittings in consultation with the responsible engineer on a commercial or training vessel of unlimited propulsion power
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. inspecting shipboard structures, components and fittings for damage, faults and deterioration against specifications a.2. identifying damaged, faulty, worn and deteriorated structures and components and initiating appropriate action for repair or replacement a.3. planning and carrying out required fabrication and repairs in consultation with the senior engineer a.4. identifying and evaluating fabrication and repair problems and determining an appropriate courses of action a.5. applying safety precautions relevant to mechanical and electrical machinery and equipment maintenance and repair operations a.6. completing mechanical and electrical machinery and equipment maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on fabrication and repair of structures, components and fittings, including specifications and directions on equipment capability and limitations b.4. following on-board housekeeping processes b.5. waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify damaged and worn structures, components and fittings, in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	3	2	2	3

TDM MB15 01A DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge to detect and identify the cause of machinery malfunctions and repair faults in accordance with the limits of responsibility of a Marine Engineer (Class 2).

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Detect, identify and investigate machinery malfunctions and faults</p>	<p>a. The operation of shipboard machinery is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance</p> <p>b. Out of specification performance and faults are identified in accordance with marine engineering practice</p> <p>c. Poor performance and faults are investigated in accordance with manufacturer's instructions and appropriate action initiated to rectify the identified problem within the limits of responsibility of an Engineer (Class 2)</p> <p>d. Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions</p> <p>e. Faulty equipment and components are identified and are reported and appropriate action is initiated as required for isolation, tagging and repair or replacement within the limits of responsibility of an Engineer (Class 2)</p> <p>f. Decisions are made to carry out temporary or permanent repairs depending on the vessel's position and circumstances</p> <p>g. Appropriate consultation taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required</p> <p>h. Management of the repair processes and the organisation and control of engine room personnel to facilitate repairs is carried out within the limits of responsibility of an Engineer (Class 2)</p>

<p>2. Repair faults in machinery</p>	<ul style="list-style-type: none"> a. Identified faults in shipboard machinery are investigated using fault-finding techniques within the limits of responsibility of an Engineer (Class 2) b. Malfunctioning or faulty machinery is correctly isolated and, if necessary, disassembled, in accordance with manufacturer's instructions and within the limits of responsibility of an Engineer (Class 2) c. Damaged or faulty components are repaired or replaced in accordance with company planned maintenance system or procedures, manufacturer's instructions and established marine engineering practice d. Repaired machinery is re-assembled in accordance with manufacturer's instructions and established marine engineering practice e. Repaired machinery is re-started and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel f. Performance of repaired machinery and associated safety devices, control systems and alarms is tested in accordance with manufacturer's instructions g. Performance against recommended performance specifications is confirmed and the machinery is re-commissioned in accordance with vessel's procedures
<p>3. Complete maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to maintenance and repair operations and machinery failure incidents b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations
<p>4. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Tests, inspections and repairs of vessel machinery and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations d. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed e. Action is taken in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and persons involved and shipboard emergency and contingency plans followed

Range Of Variables

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of marine engineering practice to the repair of machinery typically found on a vessel between 750 and unlimited propulsion power across a wide and often unpredictable variety of machinery malfunctions or faults. Contribution to the development and implementation of a broad plan or strategy for shipboard machinery maintenance and repair is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to machinery repair operations and procedures. This includes analysis of the situation and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Machinery may include that typically found on any Australian or international commercial vessel of 750 kW propulsion power or more b. Machinery performance monitoring and repair may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of machinery may include: <ul style="list-style-type: none"> c.1. steam, diesel, diesel electric and gas turbine propulsion systems and controls c.2. electrical systems and controls including primemovers c.3. batteries, transformers, switchboard, distributions systems, lighting systems c.4. steering gear, stabilizers, bow thrusters, rudders c.5. fluid power systems and controls c.6. deck machinery c.7. pumps and pumping systems c.8. auxiliary systems and controls, including <ul style="list-style-type: none"> c.8.1. fresh and salt water cooling systems c.8.2. lubricating oil cooling systems c.8.3. fuel, oil, gas, coal systems and centrifuges c.8.4. compressed air and air starting systems c.8.5. lubrication c.8.6. bilge and ballast system, oily water separator c.8.7. refrigeration and air-conditioning plant and equipment c.8.8. onboard air compressors and compressed air and control air systems c.8.9. waste management and pollution control systems as per the MARPOL Convention c.8.10. evaporators c.8.11. inert gas generator c.8.12. cargo pumps, tank washing machines and associated systems c.8.13. purifiers and clarifiers c.8.14. heaters c.8.15. sewage plant c.8.16. fixed fire fighting installations and fire control systems c.8.17. auxiliary boilers and waste heat generators c.8.18. life saving appliances c.8.19. maintenance to hull and vessel side valves

Range Of Variables (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> d. Propulsion plant configurations may include: <ul style="list-style-type: none"> d.1. low speed, medium and high speed diesel propulsion d.2. stern tube bearing d.3. fixed pitch and CPP d.4. direct drive shaft d.5. diesel electric d.6. steam plant d.7. gas turbine d.8. reduction gears d.9. thrust blocks, detuners and shaft bearings e. Testing and repair equipment may include: <ul style="list-style-type: none"> e.1. meters, gauges and other test equipment e.2. computer displays of performance parameters e.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. e.4. greasing and lubrication tools e.5. electric power tools, such as grinders, lathes, drills, etc. e.6. pneumatic power tools, such as grinders, sanders, drills, etc. e.7. welding equipment e.8. block and tackle e.9. portable and manual lifting equipment and hydraulic jacks e.10. material safety data sheets e.11. protective clothing and equipment such as: <ul style="list-style-type: none"> e.11.1. eye and ear protection e.11.2. safety boots e.11.3. dust and fume masks f. Maintenance and repair hazards may include: <ul style="list-style-type: none"> f.1. moving heavy loads using unsafe lifting procedures f.2. unsecured machinery, components or repair equipment f.3. slippery deck f.4. welding equipment f.5. sharp tools and implements f.6. power tools f.7. moving and rotating machinery f.8. flammable liquids, vapours and fuel f.9. faulty machinery equipment handling equipment and lifting gear f.10. using equipment beyond safe working limits f.11. poor housekeeping procedures f.12. non-compliance with safe working procedures f.13. electrical wiring and systems f.14. hot pipes and valves (steam, fuel oil, lubricating oil) f.15. cold pipes and valves (refrigeration and liquefied gas cargoes) f.16. working at heights g. Emergencies may include: <ul style="list-style-type: none"> g.1. loss of propulsion g.2. loss of electrical power g.3. loss of steerage g.4. flooding of engine room g.5. fire or explosion in engine room g.6. loss of refrigeration g.7. loss of water making ability g.8. fuel oil, lubrication oil, steam and gas leaks g.9. overheating and overspeed of machinery, governors, emergency trips

Range Of Variables (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.4. maintenance log, running sheets and records a.5. computer database of running information and maintenance records a.6. vessel's survey as it relates to shipboard machinery a.7. vessel's safety and emergency contingency plans and procedures a.8. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.9. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery maintenance and repair a.10. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard machinery maintenance and repair a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor the performance of shipboard machinery against specifications within the limits of responsibility of an Engineer (Class 2) a.2. Identify malfunctioning and faulty machinery and components and initiate appropriate action for repair or replacement a.3. Carry out basic trouble-shooting of malfunctioning and faulty machinery and required repairs in accordance with established procedures falling within the limits of responsibility of an Engineer (Class 2) a.4. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation, maintenance and repair of shipboard machinery a.5. Identify typical machinery maintenance and repair problems and hazards and take appropriate action falling within the limits of responsibility of an Engineer (Class 2) a.6. Communicate effectively with others during maintenance and repair operations a.7. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the management of shipboard machinery maintenance and repair operations on vessels of typically 750 kW propulsion power or more b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the checking, maintenance and repair of marine machinery including electrical machinery, systems and equipment d. Operational characteristics and performance specifications for the different types of shipboard machinery usually found on a vessel of over 750kW propulsion power e. Procedures for carrying out shipboard machinery testing, trouble-shooting and repair as part of routine maintenance procedures falling within the limits of responsibility of an Engineer (Class 2) f. Planned maintenance systems and procedures for the condition monitoring of machinery, including responsibilities and requirements covered by various forms of vessel survey g. The nature and causes of typical shipboard machinery malfunctions and the available methods for their detection and repair, including basic marine machinery malfunction fault-finding techniques h. Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions falling within the limits of responsibility of an Engineer (Class 2) i. Safe procedures for handling heavy machinery and component parts during maintenance and repair of shipboard machinery j. Safe procedures for the use of hand and power tools and maintenance equipment during maintenance and repair of shipboard machinery k. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock l. Safety, environmental and hazard control precautions and procedures relevant to shipboard machinery inspection and maintenance operations m. Principle features of vessel construction and principles of transverse stability n. A basic understanding of the properties and application of materials and structures typically used in the construction of a vessel of over 750kW propulsion power and its associated operational machinery o. Types of maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities p. Maritime communication techniques needed during maintenance and repair operations q. Knowledge and ability to read and interpret material safety data sheets r. Procedures for the testing of boiler water, machinery cooling water and lubricating oil

Evidence Guide (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

3. Required knowledge and skills
(continued)
- s. Knowledge and ability to read and interpret machinery performance readings and indications
 - t. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams
 - u. Principles of fluid power control systems, including:
 - u.1. system function requirements
 - u.2. methods of displaying system functions
 - u.3. principles of programmable logic controllers (PLCs)
 - u.4. safety requirements
 - v. Principles of air-conditioning and refrigeration systems, including:
 - v.1. principles of operation
 - v.2. performance indicators
 - v.3. characteristics, hazards and handling requirements of CFCs and HCFCs
 - v.4. safety and environmental requirements associated with air-conditioning and refrigeration systems
 - w. Principles and procedures of machinery lubrication, including:
 - w.1. theory and types of lubrication
 - w.2. relative characteristics, and applications of mineral and synthetic oils
 - w.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - x. Principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery, including:
 - x.1. statics (mainly concurrent systems)
 - x.2. friction
 - x.3. dynamics
 - x.4. balancing
 - x.5. radial, circumferential and, longitudinal stress
 - x.6. shear stress
 - x.7. fluid mechanics
 - x.8. torsion, hollow and solid shafts
 - x.9. loads due to liquid head
 - y. Principles of transverse stability and principles of naval architecture and vessel construction relevant to detection, identification and repair of faults, including:
 - y.1. draught, trim and heel
 - y.2. propellers
 - y.3. structural strength and vibration of vessels
 - y.4. vessel measurement and classification
 - y.5. load line
 - y.6. basic principles of transverse stability
 - y.7. principles of free surface effects
 - y.8. drydocks
 - y.9. lifesaving equipment
 - y.10. hull repairs and maintenance
 - z. Principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:
 - z.1. heat transfer
 - z.2. gases
 - z.3. properties and expansion of steam
 - z.4. steam cycles
 - z.5. boilers and evaporators
 - z.6. steam turbines
 - z.7. combustion
 - z.8. refrigeration and air conditioning.

Evidence Guide (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

<p>3 Required knowledge and skills (continued)</p>	<p>aa. Principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including:</p> <ul style="list-style-type: none"> aa.1. the magnetic circuit aa.2. electromagnetism and electrostatics aa.3. the electric circuit aa.4. electrolytic action and cells aa.5. principles of relevant AC and DC machines aa.6. cabling, distribution and lighting systems aa.7. control gear aa.8. switch gear aa.9. deck machinery aa.10. principles of operation of shipboard electronic components and systems, including: <ul style="list-style-type: none"> aa.10.1. electronics principles aa.10.2. integrated circuits aa.10.3. microprocessors, aa.10.4. PLCs aa.10.5. process control theory aa.10.6. instruments, calibration and testing aa.10.7. electronic control, surveillance, measurement and recording systems aa.10.8. telemetering devices aa.10.9. alarm systems aa.10.10. main and auxiliary machinery control and UMS.
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to check and repair machinery and equipment typically found on a vessel between 750 kW and 3,000 kW propulsion power, including the ability to identify an appropriate range of possible machinery malfunctions and carry out related maintenance and repair solutions; and/or b. Carry out checks and related repairs of shipboard machinery in a range of operational situations on a commercial or training vessel between 750 kW and 3,000 kW propulsion power
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 assessing operational performance of shipboard mechanical and electrical machinery and equipment a.2 identifying shipboard mechanical and electrical machinery and equipment malfunctions and faulty plant and equipment of a vessel between 750 kW and 3,000 kW propulsion power a.3 taking action to minimise any damage and pollution that could be caused by machinery malfunctions a.4 identifying and evaluating mechanical and electrical machinery and equipment maintenance and repair problems and determining an appropriate courses of action a.5 applying safety precautions relevant to mechanical and electrical machinery and equipment maintenance and repair operations a.6 completing mechanical and electrical machinery and equipment maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations pollution control and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations b.4 machinery security procedures b.5 following on-board housekeeping processes b.6 waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail

Evidence Guide (continued)

DETECT AND IDENTIFY THE CAUSE OF MACHINERY MALFUNCTIONS AND REPAIR FAULTS ON VESSELS OVER 750 KW PROPULSION POWER

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB16 01A ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to organise safe maintenance and repair procedures within the limits of responsibility of a Marine Engineer (Class 2).

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan and organise safe maintenance and repair procedures</p>	<p>a. Shipboard maintenance and repair requirements and goals are identified and defined in accordance with established marine practice and planned maintenance procedures</p> <p>b. Maintenance and repair operations and functions are correctly planned using appropriate project planning and management techniques within the limits of responsibility of an Engineer (Class 2)</p> <p>c. Maintenance resources and personnel are assigned to achieve established maintenance and repair requirements and goals in accordance with company procedures</p>
<p>2. Plan and prepare for classification and statutory machinery surveys</p>	<p>a. Classification Society and statutory surveys are planned and prepared in accordance with regulatory and class and statutory requirements within the limits of responsibility of an Engineer (Class 2)</p> <p>b. Compartments are prepared and gas freed as required for survey in accordance with established procedures and safe working practices</p> <p>c. Regions of vessel requiring routine shipboard close-up inspection and maintenance are carried out in accordance with Classification Society hull life extension programs</p> <p>d. Inspection, survey repair and maintenance procedures for hull work, propellers and shafting are analysed and planned in accordance with regulatory and survey requirements</p> <p>e. Dry-docking, in-water hull-cleaning and vessel lay-up are planned in accordance with established marine practice and regulatory /survey requirements</p>
<p>3. Monitor the completion of shipboard maintenance and repair activities</p>	<p>a. Shipboard preventative maintenance procedures are organised and completed in accordance with the limits of responsibility of an Engineer (Class 2)</p> <p>b. Appropriate response is organised to reported faults and damage to the vessel and its equipment in accordance with vessel procedures and established engineering management practice</p> <p>c. Inspections of completed maintenance and repair work are carried out as per vessel survey requirements and established engineering practice</p> <p>d. Vessel's internal communication system is used in accordance with established procedures</p>

<p>4. Lead engine-room personnel to achieve planned maintenance goals</p>	<ul style="list-style-type: none"> a. Maintenance goals and job functions are clearly defined and communicated to engine-room personnel b. Engine-room personnel are motivated to achieve planned maintenance goals using established leadership methods c. Maintenance performance standards for engine-room personnel are set, monitored and improved in accordance with established management practice and company procedures d. Effective decision-making and problem-solving techniques are applied to engine room maintenance and personnel problems e. Conflicts between engine-room personnel are resolved using established conflict-resolution procedures
<p>5. Complete maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to the organisation and inspection of maintenance and repair operations and machinery failure incidents b. All maintenance and repair documentation is completed in accordance with survey and company requirements, class and statutory regulations
<p>6. Establish safety management and hazard control strategies</p>	<ul style="list-style-type: none"> a. Safety management strategies for shipboard maintenance and repair operations are developed and implemented in accordance with class, regulatory requirements and company procedures b. Maintenance and repair hazards are identified and appropriate strategies established to minimise or eliminate risk to personnel, vessel and the environment c. Implementation of safety, hazard minimisation and pollution control procedures and regulations are monitored in accordance with regulatory requirements and company procedures d. Procedures and precautions are correctly applied to reduce the risk of scavenge and uptake fires and starting airline, crankcase and gearbox explosions and other dangerous conditions e. Procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are established and communicated to relevant engine room crew f. Personnel are trained and action is organised in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and persons involved

Range Of Variables

ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of management principles to the organisation of the maintenance and repair of the hull, structures, machinery and equipment typically found on a vessel of 750 kW propulsion power or more across a wide and often unpredictable variety of operational contexts. Contribution to the development and implementation of a broad plan or strategy for shipboard machinery maintenance and repair is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to shipboard maintenance and repair operations and procedures within the limits of responsibility of an Engineer (Class 2). This includes management, training and control of personnel, analysis of the situation and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The hull, structures, machinery and equipment to be maintained may include that typically found on any Australian or international commercial vessels of 750 kW propulsion power and more b. Maintenance and repair operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored c. Maintenance and repair operations may be carried out on all main, auxiliary and ancillary machinery including: <ul style="list-style-type: none"> c.1. steam, diesel, diesel electric and gas turbine propulsion systems and controls c.2. electrical systems and controls including primemovers c.3. batteries, transformers, switchboard, distributions systems, lighting systems c.4. steering gear, stabilizers, bow thrusters, rudders c.5. fluid power systems and controls c.6. deck machinery c.7. pumps and pumping systems c.8. auxiliary systems and controls, including <ul style="list-style-type: none"> c.8.1. fresh and salt water cooling systems c.8.2. lubricating oil cooling systems c.8.3. fuel, oil, gas, coal c.8.4. air starting c.8.5. lubrication c.8.6. bilge and ballast system, oily water separator c.8.7. refrigeration and air-conditioning plant and equipment c.8.8. onboard air compressors and compressed air and control air systems c.8.9. waste management and pollution control systems as per the MARPOL Convention c.8.10. evaporators c.8.11. inert gas generator c.8.12. cargo pumps, tank washing machines and associated systems c.8.13. purifiers and clarifiers c.8.14. heaters c.8.15. sewage plant c.8.16. fixed fire fighting installations and fire control systems c.8.17. auxiliary boilers and waste heat generators c.8.18. life saving appliances c.8.19. maintenance to hull and vessel side valves c.8.20. anchoring and mooring equipment c.8.21. maintenance of plant associated with the carriage of dangerous goods

Range Of Variables (continued)

ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>d. Organisation of maintenance and repair operations may include:</p> <ul style="list-style-type: none"> d.1. development of maintenance and repair plans d.2. planning and organisation of statutory and Classification Society surveys d.3. training, leading and motivating engine-room crew d.4. monitoring and inspection of maintenance work d.5. development and implementation of maintenance and repair safety management procedures and hazard minimisation strategies d.6. completion of running logs and maintenance reports <p>e. Propulsion plant configurations may include:</p> <ul style="list-style-type: none"> e.1. low speed, medium and high speed diesel propulsion e.2. Stern tube bearing e.3. CPP e.4. direct drive shaft e.5. diesel electric e.6. steam e.7. gas turbine e.8. reduction gears e.9. thrust blocks, detuners and shaft bearings <p>f. Emergencies may include:</p> <ul style="list-style-type: none"> f.1. loss of propulsion f.2. loss of electrical power f.3. loss of steerage f.4. flooding of engine room f.5. fire or explosion in engine room f.6. loss of refrigeration f.7. loss of water making ability f.8. fuel oil, lubrication oil, steam and gas leaks f.9. overheating and overspeed of machinery, governors, emergency trips <p>g. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> g.1. meters, gauges and electronic instrumentation g.2. computer displays of performance parameters g.3. hand tools, such as spanners, soldering irons, pliers, cutters, screwdrivers, hacksaws, etc. g.4. greasing and lubrication tools g.5. electric power tools, such as grinders, lathes, drills, etc. g.6. pneumatic power tools, such as grinders, sanders, drills, etc. g.7. welding equipment g.8. block and tackle and portable and manual lifting equipment and jacks g.9. protective clothing and equipment such as: <ul style="list-style-type: none"> g.9.1. eye and ear protection g.9.2. safety boots and helmet g.9.3. dust and fume masks g.9.4. boilersuit / overalls <p>h. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> h.1. moving heavy loads using unsafe lifting procedures h.2. unsecured machinery, components or repair equipment h.3. slippery deck h.4. welding equipment h.5. sharp tools and implements h.6. power tools h.7. moving and rotating machinery h.8. flammable liquids, vapours and fuel h.9. faulty machinery equipment handling equipment and lifting gear h.10. using equipment beyond safe working limits h.11. poor housekeeping procedures h.12. non-compliance with safe working procedures h.13. electrical wiring and systems h.14. faulty earthing on systems and equipment h.15. hot pipes and valves (steam, fuel oil, lubricating oil) h.16. cold pipes and valves (refrigeration and liquefied gas cargoes) h.17. working at heights h.18. noxious and dangerous cargoes

Range Of Variables (continued)

ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none">a.1. ISM Code safety management system plans, procedures, checklists and instructionsa.2. vessel and company's planned maintenance system, repair procedures and instructionsa.3. machinery and vessel manufacturer's specifications, instructions and recommended proceduresa.4. maintenance log, running sheets and records including computer database of running information and maintenance records where relevanta.5. vessel's survey procedures and instructions as they relates to shipboard machinerya.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery maintenance and repaira.7. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none">a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to maintenance and repair operations and surveys on vesselsa.2. relevant international, Australian and State/Territory OH&S legislationa.3. relevant international, Australian and State/Territory engineering practice standards

ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Organise and plan survey, maintenance and repair operations within the scope of responsibility of an Engineer (Class 2) a.2. Lead and motivate the engine room staff to the achievement of maintenance and repair goals a.3. Monitor and inspect maintenance and repairs within the scope of responsibility of an Engineer (Class 2) a.4. Establish and implement a safety management strategy for maintenance and repair operations within the scope of responsibility of an Engineer (Class 2) a.5. Identify typical machinery maintenance and repair problems and hazards and establish appropriate hazard control strategies a.6. Communicate effectively with others during the organisation and management of maintenance and repair operations including effective use of internal communication systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of IMO STCW 95 Code and AMSA Marine Orders applicable to the management of shipboard machinery maintenance and repair operations on vessels of typically 750 kW propulsion power or more b. Relevant OH&S legislation, policies and procedures c. Established engineering management practice for organising and inspecting the maintenance and repair of marine machinery, structures and equipment including personnel management and training requirements d. Engineering project scheduling and planning methods including the use of GANTT charts and CPM / PERT network techniques e. Functions and responsibilities of the engine room personnel for survey, maintenance and repair operations onboard a vessel of typically 750 kW propulsion power or more f. Established staff leadership and motivational principles and techniques, including conflict resolution procedures g. Operational characteristics and performance specifications for the different types of shipboard machinery and equipment usually found on a vessel of typically 750 kW propulsion power or more h. Procedures for carrying out shipboard machinery testing, trouble-shooting and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations i. Planned maintenance systems and procedures for the condition monitoring of shipboard machinery, structures and equipment, including responsibilities and requirements covered by various forms of vessel survey j. Planning and operational procedures for dry docking and refloating, in-water cleaning and survey, and vessel lay-up k. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock l. Procedures for the testing of boiler water, machinery cooling water and lubricating oil m. Principle features of vessel construction and principles of transverse and longitudinal stability n. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, operational manuals, specifications and electrical and control circuit diagrams o. Knowledge and ability to read and interpret machinery performance readings and indications p. Knowledge and ability to read and interpret Material Safety Data Sheets q. A basic understanding of the properties, characteristics and application of materials and structures typically used in the construction of a vessel of typically 750 kW propulsion power or more and its associated operational machinery and a basic knowledge of the properties and characteristics of liquids, fuels, lubricants, gases and vapours used onboard a vessel r. The nature and causes of typical shipboard machinery / equipment malfunctions and the available methods for their detection and repair, including machinery malfunction fault-finding techniques

Evidence Guide (continued)

ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

3. Required knowledge and skills (continued)
- s. Maintenance and repair hazards and problems and appropriate preventative and remedial strategies
 - t. Principles, consequences and prevention strategies for scavenge and uptake fires and starting airline, crankcase and gearbox explosions
 - u. Safety and environmental management strategies applicable to maintenance and repair operations on a vessel of 750 kW propulsion power or more, including:
 - u.1. requirements specified in Material Safety Data Sheets and OHS regulations
 - u.2. safety, environmental and hazard control precautions and procedures relevant to shipboard machinery inspection and maintenance operations
 - u.3. safe procedures for handling heavy machinery and component parts during maintenance and repair of shipboard machinery
 - u.4. safe procedures for the use of hand and power tools and maintenance equipment during maintenance and repair of shipboard machinery, structures and equipment
 - v. Basic principles of fluid power control systems, including:
 - v.1. system function requirements
 - v.2. methods of displaying system functions
 - v.3. programming programmable logic controllers (PLCs)
 - v.4. safety requirements
 - w. Basic principles of air-conditioning and refrigeration systems, including:
 - w.1. principles of operation
 - w.2. performance indicators
 - w.3. characteristics, hazards and handling requirements of CFCs and HCFCs
 - w.4. safety and environmental requirements associated with air-conditioning and refrigeration systems
 - x. Principles and procedures of machinery lubrication, including:
 - x.1. theory and types of lubrication
 - x.2. relative characteristics, and applications of mineral and synthetic oils
 - x.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - y. Principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery, including:
 - y.1. statics (mainly concurrent systems)
 - y.2. friction
 - y.3. dynamics
 - y.4. balancing
 - y.5. radial, circumferential and, longitudinal stress
 - y.6. shear stress
 - y.7. fluid mechanics
 - y.8. torsion, hollow and solid shafts
 - y.9. loads due to liquid head
 - z. Basic principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including:
 - z.1. the magnetic circuit
 - z.2. electromagnetism and electrostatics
 - z.3. the electric circuit
 - z.4. electrolytic action and cells
 - z.5. principles of relevant AC and DC machines
 - z.6. cabling, distribution and lighting systems
 - z.7. control gear
 - z.8. switch gear
 - z.9. deck machinery
 - z.10. principles of operation of shipboard electronic components and systems, including:
 - z.10.1. electronics principles
 - z.10.2. integrated circuits
 - z.10.3. microprocessors,
 - z.10.4. PLCs
 - z.10.5. process control theory
 - z.10.6. instruments, calibration and testing
 - z.10.7. electronic control, surveillance, measurement and recording systems
 - z.10.8. telemetering devices
 - z.10.9. alarm systems
 - z.10.10. main and auxiliary machinery control and UMS.

Evidence Guide (continued)

ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> aa. Basic principles of transverse stability and principles of naval architecture and vessel construction relevant to detection, identification and repair of faults, including: <ul style="list-style-type: none"> aa.1. draught, trim and heel aa.2. propellers aa.3. structural strength and vibration of vessels aa.4. vessel measurement and classification aa.5. load line aa.6. basic principles of transverse stability aa.7. principles of free surface effects aa.8. dry docks aa.9. lifesaving equipment aa.10. hull repairs and maintenance bb. Maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities cc. Maritime communication techniques needed during maintenance and repair operations
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to organise the maintenance and repair of structures, machinery and equipment typically found on a vessel of 750 kW propulsion power or more; and/or b. Organise surveys, maintenance and repair operations in a range of operational situations on a commercial or training vessel of 750 kW propulsion power or more
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning and organising survey, maintenance and repair operations a.2 assessing operational performance of shipboard machinery and equipment a.3 identifying shipboard machinery malfunctions and faulty plant and equipment and initiating appropriate action to minimise any damage and pollution that could be caused a.4 monitoring and inspecting shipboard machinery maintenance and repairs a.5 identifying and evaluating machinery maintenance and repair problems and determining an appropriate courses of action a.6 establishing safety management strategies relevant to mechanical and electrical machinery and equipment maintenance and repair operations a.7 completing machinery maintenance and repair documentation and records a.8 organising and training personnel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations b.4 managing machinery and equipment security procedures and housekeeping processes b.5 managing waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

ORGANISE SAFE MAINTENANCE AND REPAIR PROCEDURES ON VESSELS OF OVER 750 KW PROPULSION POWER

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB17 01A TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL MACHINERY AND ELECTRICAL AND ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OVER 750 KW PROPULSION POWER

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to test, detect faults and maintain and restore electrical / electronic control equipment to operating condition in accordance with the limits of responsibility of a Marine Engineer (Class 2).

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Detect, identify and investigate electrical machinery and electronic equipment malfunctions and faults</p>	<p>a. The operation of shipboard electrical and electronic equipment is monitored in accordance with vessel's survey requirements, planned maintenance requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance</p> <p>b. Poor performance and faults are identified in accordance with marine engineering practice</p> <p>c. Poor performance and faults are investigated in accordance with the responsibilities of and Engineer (Class 2) and appropriate action initiated to rectify the identified problem</p> <p>d. Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions</p> <p>e. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with the responsibilities of and Engineer (Class 2)</p> <p>f. Decisions made to carry out temporary or permanent repairs depending on the vessel's position and circumstances</p> <p>g. Appropriate consultation taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required</p> <p>h. Coordination of the repair processes and the organisation and control of engine room personnel to facilitate repairs is in accordance with the responsibilities of and Engineer (Class 2)</p>

<p>2. Repair faults in electrical machinery and electronic equipment</p>	<ul style="list-style-type: none"> a. Identified faults in shipboard electrical and electronic equipment are investigated using established fault-finding techniques b. Malfunctioning or faulty electrical and electronic equipment is correctly isolated, disassembled, if necessary in accordance with the responsibilities of and Engineer (Class 2) and manufacturer's instructions c. Damaged or faulty components are repaired or replaced in accordance with company planned maintenance system procedures, manufacturer's instructions and established marine engineering practice d. Repaired electrical and electronic equipment is re-assembled in accordance with manufacturer's instructions and established marine engineering practice e. Repaired electrical and electronic equipment is tested and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel f. Repaired electrical and electronic equipment and associated safety devices, control systems and alarms are re-started/re-activated and their performance tested in accordance with manufacturer's instructions g. Tests are conducted to the requirements of class and statutory surveys h. Performance against recommended performance specifications is confirmed and the electrical and electronic equipment is re-commissioned in accordance with the responsibilities of and Engineer (Class 2)
<p>3. Complete maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to maintenance and repair operations and equipment failure incidents b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations
<p>4. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Action is taken in the event of a electrical and electronic equipment failure or emergency to isolate and secure the electrical and electronic equipment and the vessel and maintain the safety of the vessel and persons involved e. Shipboard emergency and contingency plans followed in the event of a electrical and electronic equipment failure or emergency

Range Of Variables

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of basic fault finding techniques to the repair of electrical machinery and electronic control equipment typically found on a vessel of 750 kW propulsion power or more across a wide and often unpredictable variety of equipment malfunctions or faults. Contribution to the development and implementation of a broad plan or strategy for the maintenance and repair of shipboard electrical and electronic control equipment is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to electrical and electronic equipment repair operations and procedures. This includes hazard minimisation, analysis of situations and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Shipboard electrical and electronic control equipment may include that typically found on any Australian or international commercial vessel of 750 kW propulsion power or more b. Performance monitoring and repair of shipboard electrical and electronic control equipment may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock c. Types of electrical and electronic control equipment may include:: <ul style="list-style-type: none"> c.1. programmable logic controllers (PLCs) c.2. signal transmission systems used for monitoring and control c.3. temperature and pressure sensors c.4. electronic PID controllers c.5. analog to digital converters c.6. electrical and electronic equipment space monitoring alarm and control systems c.7. a.c. generators c.8. a.c. and d.c. motors, including: <ul style="list-style-type: none"> c.8.1. three phase induction motors such as squirrel cage, double cage, wound rotor and slip ring, TEFC, splash proof and submersible c.8.2. three phase synchronous motors c.9. three phase alternators c.10. three phase transformers c.11. electronic instrumentation and power supply circuits c.12. main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> c.12.1. distribution circuits and wiring c.12.2. protection devices c.12.3. circuit breakers c.13. emergency supply systems including emergency generators, emergency switchboard and battery banks c.14. electronic governors c.15. deck electrical machinery

Range Of Variables (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>d. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> d.1. electronic instrumentation meters and gauges, oxygen meter and gas detectors d.2. computer displays of performance parameters d.3. hand tools, such as soldering irons, pliers, cutters, wire-strippers, spanners, wrenches, screwdrivers, hacksaws, etc. d.4. electric power tools, such as grinders, lathes, drills, etc. d.5. pneumatic power tools, such as grinders, sanders, drills, etc. d.6. block and tackle d.7. portable and manual lifting equipment and hydraulic jacks d.8. material safety data sheets d.9. protective clothing and equipment such as: <ul style="list-style-type: none"> d.9.1. eye and ear protection d.9.2. safety boots d.9.3. dust and fume masks d.9.4. boilersuit/overalls d.9.5. safety helmet <p>e. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> e.1. exposed live circuits e.2. faulty earth connections e.3. moving heavy loads using unsafe lifting procedures e.4. unsecured electrical and electronic equipment, components or repair equipment e.5. sharp tools and implements e.6. power tools e.7. moving and rotating electrical and electronic equipment e.8. faulty equipment, handling equipment and lifting gear e.9. using equipment beyond safe working limits e.10. poor housekeeping procedures e.11. non-compliance with safe working procedures e.12. electrical wiring and systems e.13. hot pipes and valves (steam, fuel oil, lubricating oil) e.14. cold pipes and valves (refrigeration and liquefied gas cargoes) e.15. working at heights e.16. overspeed of electrical machinery, emergency trips e.17. noxious and dangerous cargoes <p>f. Emergencies may include:</p> <ul style="list-style-type: none"> f.1. loss of electrical power f.2. short circuits and open-circuits in distribution systems f.3. loss of electronic / electrical control of systems f.4. flooding of engine room f.5. fire or explosion in engine room f.6. failure of emergency alarm and control systems f.7. loss of refrigeration f.8. overloading of electrical systems
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. electrical and electronic equipment maintenance log, running sheets and records a.5. computer database of running information and maintenance records a.6. vessel's survey procedures and instructions as they relates to shipboard electrical and electronic equipment a.7. vessel's safety and emergency contingency plans and procedures a.8. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard electrical and electronic equipment maintenance and repair a.9. instructions of relevant Maritime Authorities and class societies concerning shipboard electrical and electronic equipment maintenance and repair

Range Of Variables (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard electrical and electronic equipment maintenance and repair a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory electrical and electronic engineering practice standards

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor the performance of shipboard electrical and electronic equipment against specifications on a vessel within limits of responsibility of an Engineer (Class 2) a.2. Identify malfunctioning and faulty electrical and electronic equipment and components and initiate appropriate action for repair or replacement within limits of responsibility of an Engineer (Class 2) a.3. Use basic trouble-shooting techniques to investigate malfunctioning and faulty electrical and electronic equipment and carry out required repairs in accordance with the limits of responsibility of an Engineer (Class 2) a.4. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation, maintenance and repair of shipboard electrical and electronic equipment a.5. Identify typical electrical and electronic equipment maintenance and repair problems and hazards and take appropriate action within the limits of responsibility of an Engineer (Class 2) a.6. Communicate effectively with others during maintenance and repair operations including effective use of internal communication systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders b. Relevant OH&S legislation and policies c. Established procedures for the checking, maintenance and repair of marine electrical and electronic equipment, systems and equipment d. Operational characteristics and performance specifications for the different types of shipboard electrical and electronic equipment usually found on a vessel between 750 and 3,000kW propulsion power e. Planned maintenance systems and procedures for the condition monitoring of electrical and electronic equipment, including responsibilities and requirements covered by various forms of vessel survey f. The nature and causes of typical shipboard electrical and electronic equipment malfunctions and the available methods for their detection and repair, including marine electrical and electronic equipment malfunction fault-finding techniques g. Procedures for carrying out shipboard electrical and electronic equipment testing, trouble-shooting and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations h. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures for electrical and electronic equipment on board vessels at sea, alongside and in dry dock i. A basic understanding of the power distribution and control circuits typically used onboard a vessel 3,000 kW propulsion power or more and their associated operational electrical and electronic equipment j. Concepts of Unmanned Machinery Spaces (UMS) and automated monitoring and control of machinery k. Practical characteristics and application of shipboard electrical machines including: <ul style="list-style-type: none"> k.1. a.c. and d.c. motors k.2. a.c. generators including requirements for the parallel operation and the process of synchronisation k.3. three phase induction motors including the various starting methods k.4. three phase motors including synchronous motors k.5. three phase alternators operating singly and in parallel k.6. three phase transformers l. Principles and techniques for finding faults in shipboard control systems m. Procedures for the calibration and adjustment of transmitters and controllers in control systems n. Principles and applications of programmable logic controllers (PLCs)

Evidence Guide (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OVER 750 KW PROPULSION POWER

3. Required knowledge and skills
(continued)
- o. Knowledge and ability to read and interpret electrical and electronic equipment performance readings and instrumentation
 - p. Common active devices and their application in power electronic and electronic circuits typically used on vessels of typically 750 kW propulsion power and more, including:
 - p.1. ability to identify the devices and their circuit symbols
 - p.2. operating characteristics of common active devices
 - p.3. applications of common active devices
 - q. Common integrated circuit devices and their application in shipboard electronic instrumentation and power supply circuits, including:
 - q.1. operational amplifiers
 - q.2. voltage regulators
 - q.3. multivibrators
 - r. Common digital electronic circuits and their application in shipboard electronic instrumentation systems, including:
 - r.1. digital integrated circuits
 - r.2. analog to digital converters
 - r.3. microprocessors
 - r.4. digital communication bus transmission system using optical and electronic sub-systems
 - s. Principles and procedures for electrical and electronic measurement, including the use of oscilloscopes and multimeters and insulation resistance measurement using a Megger
 - t. Procedures for identifying faults and carrying out basic repairs on 4 to 20 mA loops including:
 - t.1. open and short circuits
 - t.2. earth faults
 - t.3. high resistance joints
 - t.4. power supply faults
 - t.5. electronic component failure
 - u. Principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including:
 - u.1. electromagnetism and electrostatics
 - u.2. electrolytic action and cells
 - u.3. the electric circuit
 - u.4. principles and practical characteristics of AC and DC machines and related electrical and electronic control equipment
 - u.5. cabling, distribution and lighting systems
 - u.6. control and switch gear
 - u.7. deck electrical and electronic equipment
 - u.8. principles of operation of shipboard electronic components and systems, including:
 - u.8.1. electronics principles
 - u.8.2. integrated circuits, microprocessors and PLCs
 - u.8.3. process control theory
 - u.8.4. instruments, calibration and testing
 - u.8.5. electronic control, surveillance, measurement and recording systems
 - u.8.6. telemetering devices
 - u.8.7. alarm systems, including fire and emergency alarm systems
 - u.8.8. main and auxiliary machinery control and UMS.
 - u.9. principles of 2 and 3 term controllers
 - v. Types of maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities
 - w. Maritime communication techniques needed during maintenance and repair operations
 - x. Knowledge and ability to read and interpret material safety data sheets
 - y. Knowledge and ability to read and interpret vessel and electrical and electronic equipment specifications, equipment drawings, operational manuals, and electrical and control circuit diagrams
 - z. Typical maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions during maintenance and repair of shipboard electrical and electronic equipment
 - aa. Safety, environmental and hazard control precautions and procedures relevant to shipboard electrical and electronic equipment inspection and maintenance operations
 - bb. Safe procedures for handling heavy electrical and electronic equipment and component parts during maintenance and repair of shipboard electrical and electronic equipment
 - cc. Safe procedures for the use of hand and power tools and maintenance equipment

Evidence Guide (continued)

TEST, DETECT FAULTS AND MAINTAIN AND RESTORE ELECTRICAL / ELECTRONIC CONTROL EQUIPMENT TO OPERATING CONDITION ON VESSELS OVER 750 KW PROPULSION POWER

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated fault situations and other assessments that demonstrate the skills and knowledge to check and repair electrical and electronic equipment typically found on vessels of typically 750 kW propulsion power and more; and/or b. Complete checks and related repairs of shipboard electrical and electronic equipment in a range of operational situations on a commercial or training vessel of 750 kW propulsion power or more
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 assessing operational performance of electrical machinery and electronic equipment and identifying malfunctions and faulty plant and equipment of a vessel of typically 750 kW propulsion power and more a.2 taking action to minimise any damage and safety risk that could be caused by electrical and electronic equipment malfunctions a.3 managing, training and controlling personnel and carrying out repairs of shipboard electrical and electronic equipment a.4 identifying and evaluating electrical and electronic equipment maintenance and repair problems and determining an appropriate courses of action a.5 identifying and implementing improvements to electrical and electronic equipment checking, maintenance and repair procedures a.6 applying safety precautions relevant to electrical and electronic equipment maintenance and repair operations a.7 completing maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures, quality procedures and work instructions on the checking and repair of shipboard electrical and electronic equipment, including electrical and electronic equipment specifications and directions on equipment capability and limitations b.4 following on-board housekeeping processes c. Action taken promptly to report and/or rectify electrical and electronic equipment malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	2	3

TDM MB19 01A CARRY OUT BASIC HULL SERVICING

Field B Equipment Checking and Servicing

DESCRIPTION:

This unit involves the skills and knowledge required to carry out basic hull servicing on a small commercial vessel operating in near coastal waters.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Master (Class 5) and a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
1. Carry out basic hull inspection and servicing procedures	<ul style="list-style-type: none">a. Inspections of the vessel's hull, propeller and underwater equipment are carried out within limits of responsibility in accordance with company procedures and manufacturer's instructionsb. Any deterioration of a vessel's structure, fittings, propeller and underwater equipment is identified and appropriate basic servicing action initiated or carried out in accordance with company proceduresc. Records of servicing work are completed in accordance with company procedures
2. Maintain watertight integrity of a small vessel	<ul style="list-style-type: none">a. Checks and inspections on the watertight integrity of the vessel is in accordance with company procedures and safety regulationsb. Dangers to watertight integrity are identified and appropriate action is taken to report and rectify or minimise the hazardsc. Repairs and corrosion control are initiated and carried out in accordance with company procedures and manufacturer's instructionsd. Records of repairs and corrosion control and action to ensure watertight integrity are complete, accurate and comply with company procedures
3. Select and use servicing equipment and materials	<ul style="list-style-type: none">a. Tools and equipment are correctly identified and used in accordance with OH&S requirements, company procedures and manufacturer's instructionsb. Defective tools, equipment and materials are identified and reported, repaired and/or replaced as required by company proceduresc. Servicing equipment is correctly cleaned and stored after use
4. Follow safety and hazard control procedures	<ul style="list-style-type: none">a. All required safety precaution and regulations are followed when carrying out basic hull servicingb. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, ship and the environmentc. Safety and hazard minimisation procedures and regulations are followed at all times during basic hull servicingd. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed after authorisation by a responsible officer

Range Of Variables

CARRY OUT BASIC HULL SERVICING

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small trading vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable servicing problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel operating in near coastal waters b. Hull material may include: <ul style="list-style-type: none"> b.1. timber b.2. steel b.3. composite b.4. marine grade alloy b.5. ferro-concrete c. Basic hull servicing on a vessel may be carried out: <ul style="list-style-type: none"> c.1. when berthed or moored c.2. when slipped or in dry dock d. Basic servicing may include: <ul style="list-style-type: none"> d.1. routine inspections of the watertight integrity of the vessel d.2. identification of any deterioration of a vessel's hull, structure, fittings, propeller and underwater equipment d.3. cleaning and polishing d.4. checking and replacing sacrificial anodes e. Underwater equipment may include: <ul style="list-style-type: none"> e.1. sea valves and strainers e.2. bearings (stern and rudder) e.3. lock-pin e.4. skin fittings f. Servicing tools and equipment may include: <ul style="list-style-type: none"> f.1. hand tools including chipping hammers and scrapers f.2. electric power tools such as grinders, sanders and drills, f.3. pneumatic power tools such as grinders, sanders and drills f.4. protective clothing and equipment such as: <ul style="list-style-type: none"> f.4.1. eye and ear protection f.4.2. safety boots and helmet f.4.3. dust and fume masks g. Deterioration of vessel's structure and fittings may include: <ul style="list-style-type: none"> g.1. corrosion to hull fittings and equipment g.2. decay of timber surfaces g.3. deterioration of propellers and underwater equipment h. Action to maintain watertight integrity of vessel may include: <ul style="list-style-type: none"> h.1. closing of sea valves h.2. repair of corrosion h.3. closing of hatches h.4. checks on hull fittings
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with hull servicing and watertight integrity on small vessels a.2. vessel and company hull servicing procedures a.3. vessel and equipment manufacturer's instructions, specifications and procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code related to the seaworthiness of vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

CARRY OUT BASIC HULL SERVICING

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carry out basic routine hull servicing and checks of the water tight integrity of a small vessel within limits of responsibility a.2. Carry out routine observational monitoring of propellers and underwater equipment a.3. Initiate action to repair hull damage or deterioration in accordance with company procedures and manufacturer's instructions a.4. Identify typical problems related to the basic hull servicing of a small vessel and take appropriate action in conjunction with others a.5. Exercise all required safety, environmental and hazard control precautions and procedures during hull inspection and servicing operations a.6. Communicate effectively with others when carrying out hull servicing procedures on board a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Master (Class 5) or a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S procedures b. Procedures for the checking and inspecting the hull of a small vessel as part of routine servicing c. Knowledge of the problems likely to be found during the inspection and basic routine servicing of hulls on small vessels including an awareness of the required standard of paintwork and antifouling d. The nature and causes of corrosion of marine surfaces and structures and the methods for its control e. Hull corrosion control measures, including surface preparation, painting and the use of sacrificial anodes f. Safety, environmental and hazard control precautions and procedures relevant to hull inspection and servicing operations g. Principle features of the structure of typical small vessels h. Types of servicing records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out basic, routine hull inspection and servicing procedures and operations to maintain the watertight integrity of a small commercial vessel, and/or b. carry out procedures on a small operational commercial or training vessel to: <ul style="list-style-type: none"> b.1. undertake basic, routine hull inspection and servicing b.2. undertake operations to maintain the watertight integrity of the vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. carrying out basic routine hull inspection and servicing a.2. checking and maintaining the watertight integrity of a small vessel a.3. identifying and evaluating hull servicing problems and determining appropriate courses of action a.4. applying safety precautions relevant to hull inspection and servicing operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of the Australian USL Code b.2. OHS and pollution control regulations and hazard prevention policies and procedures b.3. job procedures and work instructions b.4. relevant vessel manufacturer's guidelines relating to hull inspection and routine servicing procedures b.5. environmental protection procedures when carrying out servicing operations c. Action is taken promptly to report and/or rectify issues and problems identified during hull inspection and servicing in accordance with manufacturer's instructions, regulations and company procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

CARRY OUT BASIC HULL SERVICING

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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

TDM MB20 01A ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to assist the engineer in the routine maintenance of main propulsion and ancillary machinery and systems, including working as part of a team and under supervision on the basic maintenance of diesel engines, marine steam turbines, steam boilers, pumps, heat exchangers, fresh water generators, compressed air systems, steering systems, engine room safety systems, electrical systems, refrigeration systems and engine room systems. It includes assistance in the checking and keeping of some maintenance data records .

ELEMENT	PERFORMANCE CRITERIA
<p>1. Assist in the routine maintenance of main and ancillary machinery and associated systems</p>	<p>a. Assist the Engineer to perform planned basic routine maintenance of main propulsion and ancillary machinery and associated systems.</p> <p>b. Signs of malfunction in main propulsion and ancillary machinery and associated systems are reported to the engineer</p> <p>c. Maintenance tasks on the main propulsion and ancillary machinery and associated systems required of an integrated rating are completed under the supervision of the engineer</p> <p>d. Records of maintenance activities are completed as directed and in accordance with established practice</p>
<p>2. Follow safety and hazard control procedures</p>	<p>a. All required safety precautions and regulations are followed when working in engine-room and ancillary machinery and associated spaces</p> <p>b. Operational hazards are identified and action is taken in conjunction with the engineer and other team members to minimise or eliminate risk to personnel, vessel and the environment</p> <p>c. Where relevant, procedures and precautions necessary for entry into confined spaces , after authorization by a responsible officer, on a vessel are correctly followed</p> <p>d. Understanding of the types of appropriate action that the Engineer may initiate in the event of a failure or emergency associated with main propulsion and ancillary machinery and associated systems to isolate and secure the plant and equipment and the vessel and maintain the safety of the vessel and persons involved so that the integrated rating can give assistance if required.</p> <p>e. Shipboard emergency and contingency plans are followed in the event of a failure or emergency associated with main propulsion and ancillary machinery and associated systems (including engineroom explosion/fire and hull-breach)</p>

Range Of Variables

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in accordance with relevant regulations. b. Work is performed under the direction and supervision of the engineer, within defined practice and procedures with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the assistance to the engineer in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems on a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. The vessel may be any Australian or international commercial vessel of 3,000 kW propulsion power or more b. Assistance in the basic maintenance of the main propulsion and ancillary machinery and associated systems may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. while in dry dock c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. main propulsion and ancillary machinery and associated systems may include: <ul style="list-style-type: none"> d.1. steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls d.2. steam boilers d.3. steering gear, stabilizers, bow thrusters, rudders d.4. fluid power systems and controls d.5. pumps and pumping systems d.6. ancillary systems and controls, including <ul style="list-style-type: none"> d.6.1. fresh and salt water cooling systems d.6.2. lubricating oil cooling systems d.6.3. fuel, oil, gas, coal d.6.4. air starting d.6.5. lubrication d.6.6. onboard air compressors and compressed air and control air systems d.6.7. waste management and pollution control systems as per the MARPOL Convention d.6.8. sewage plant d.7. fixed fire fighting installations and fire control systems e. Emergencies may include: <ul style="list-style-type: none"> e.1. loss of propulsion e.2. loss of steerage e.3. flooding of engine room e.4. fire or explosion in engine room e.5. loss of refrigeration e.6. loss of water making ability e.7. fuel oil, lubrication oil, steam and gas leaks e.8. loss of electrical power e.9. pump failure e.10. overheating and overspeed of machinery, governors, emergency trips e.11. electric shock

Range Of Variables (continued)

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>f. Potential hazards during operation of main propulsion and ancillary machinery and associated systems may include:</p> <ul style="list-style-type: none"> f.1 operating equipment beyond safe working limits f.2 moving and rotating machinery f.3 working in confined spaces f.4 faulty machinery equipment handling equipment and lifting gear f.5 non-compliance with safe working procedures f.6 hot pipes and valves (steam, fuel oil, lubricating oil) f.7 cold pipes and valves (refrigeration and liquefied gas cargoes) f.8 flammable liquids, vapours and fuel f.9 working at heights f.10 moving heavy loads using unsafe lifting procedures f.11 unsecured machinery, components or equipment f.12 slippery deck f.13 poor housekeeping procedures f.14 sharp tools and implements f.15 power tools f.16 dangerous atmosphere f.17 overspeed of electrical machinery, emergency trips f.18 noxious and dangerous cargoes f.19 machinery overload
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. planned maintenance systems, procedures and engineer's instructions a.3. running sheets, operations logs and other records a.4. computer database of running information a.5. vessel's survey procedures and instructions as they relate to the main propulsion and ancillary machinery and associated systems a.6. vessel's safety and emergency contingency plans and procedures a.7. relevant sections of national and international regulations, IMO Conventions and Codes
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the main propulsion and ancillary machinery and associated systems on vessels of 3,000 kW propulsion power or more a.2. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Assist the engineer in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems a.2. Identify and report to the engineer signs of malfunction in the main and ancillary machinery and associated systems a.3. Exercise all required safety, environmental and hazard control precautions and procedures when assisting in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems a.4. Communicate effectively with the engineer and other team members others during maintenance activities
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an integrated rating.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S and pollution control legislation and policies c. Procedures required of an integrated rating if assisting the Engineer in the performance of inspections, maintenance and data recording on main propulsion and ancillary machinery and systems, including: <ul style="list-style-type: none"> c.1. parameters to be measured and recorded c.2. the types of machinery faults that should be recognised by an integrated rating c.3. procedures for soot blowing boiler tubes c.4. procedures for draining scavenge spaces c.5. procedures for assisting the engineer, if required, in the warming through and shut down of a marine diesel engine plant c.6. procedures for the preparation of tools and equipment used in maintenance operations c.7. procedures for the cleaning of propulsion and ancillary machinery (as required of an integrated rating) c.8. procedures for identifying and rectifying basic faults in a lifeboat engine c.9. procedures for the warming through of a steam line and the prevention of water hammer c.10. procedures for the lubrication of machinery (as required of an integrated rating) c.11. procedures on domestic piping/pumping systems (as required of an integrated rating) c.12. procedures for assisting the engineer in the isolation of systems for maintenance activities d. A basic understanding of the operational characteristics and normal performance of the main and ancillary machinery and associated control systems e. Typical hazards and problems that can occur in the engine-room at any time as well as during the maintenance of main and ancillary machinery and associated systems. f. Elementary principles of diesel engine basic maintenance, including: <ul style="list-style-type: none"> f.1. the operating cycles and types of diesel engines f.2. the major components of marine diesel engines and their functions f.3. the maintenance 'running-sheets' to be recorded by an integrated rating f.4. basic maintenance on diesel engines to be conducted by an integrated rating under the supervision of an engineer g. Elementary principles of marine steam turbine basic maintenance, including: <ul style="list-style-type: none"> g.1. steam flow through a typical marine turbine g.2. the major components of marine steam turbines and their functions g.3. the maintenance 'running-sheets' to be recorded by an integrated rating g.4. basic maintenance on marine steam turbines to be conducted by an integrated rating under the supervision of an engineer

Evidence Guide (continued)

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

<p>3. Required knowledge and skills (continued)</p>	<p>h. Elementary principles of marine steam boiler basic maintenance, including:</p> <ul style="list-style-type: none"> h.1. the uses of steam on board a vessel h.2. the methods of generating steam on board a vessel h.3. the features, elements, functions and applications of low, medium and high pressure boilers h.4. basic maintenance on marine steam boilers to be conducted by an integrated rating under the supervision of an engineer <p>i. Elementary principles of marine shafting systems and their basic maintenance, including:</p> <ul style="list-style-type: none"> i.1. propeller types i.2. the features and functions of thrust blocks, intermediate bearings, gear box and stern tube i.3. the methods of achieving astern motion on a vessel i.4. basic maintenance on marine shafting systems to be conducted by an integrated rating under the supervision of an engineer <p>j. Elementary principles and functions of marine ancillary systems and their basic maintenance, including:</p> <ul style="list-style-type: none"> j.1. various valve and pump types commonly encountered on vessels and their functions j.2. various types of heat exchangers commonly encountered on vessels and their functions j.3. fresh water generators j.4. pollution control and waste handling equipment j.5. steering mechanisms j.6. electrical distributions systems including an awareness of the license restrictions of the statutory electrical authorities j.7. refrigeration systems j.8. centrifuge purifiers j.9. sea water systems j.10. fresh water cooling systems j.11. lubricating oil systems j.12. fuel oil systems j.13. compressed air system j.14. seed water system j.15. steam / condensate system <p>k. Manufacturer's warnings and instructions concerning the handling and use of chemicals and cleansing agents</p> <p>l. Procedures for the use of personal protection clothing and equipment (PPE)</p> <p>m. Procedures and precautions for entering, after authorization by a responsible officer, confined spaces on a vessel</p> <p>n. Freezer space and engine-room escape procedures</p> <p>o. Dangers associated with compressed air and high pressure fluids and related precautions</p> <p>p. Hazards and dangers associate with electricity and related precautions</p> <p>q. Dangers associated with lubricating operating steering mechanisms and related precautions</p> <p>r. Operational and maintenance records that must be maintained on a vessel</p> <p>s. Knowledge and ability to read and interpret material safety data sheets</p> <p>t. Maritime communication techniques needed during the maintenance of main propulsion and ancillary machinery and associated systems</p>
<p>3. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to assist the engineer in the planned routine maintenance of the main propulsion and ancillary machinery and associated systems on a vessel; and/or b. assist the engineer in the planned routine maintenance of the main propulsion and ancillary machinery and associated systems on a commercial or training vessel of 3,000 kW propulsion power or more

Evidence Guide (continued)

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

4. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. assisting the engineer in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems a.2. applying safety precautions relevant to the main propulsion and ancillary machinery and associated system a.3. completing documentation and records as directed b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. OHS regulations pollution control and hazard prevention regulations and policies b.3. ISM Code safety management system procedures, quality procedures and work instructions b.4. following on-board housekeeping processes c. Action taken promptly to report signs of malfunctions in main and ancillary machinery and associated systems in accordance with regulations, shipboard procedures and the ISM Code d. Work is completed systematically to required standard
5. Context for assessment	<ul style="list-style-type: none"> a. Assessment of this unit must include approved arrangements for the assessment of knowledge and practical competence b. Assessment of knowledge and competence may occur: <ul style="list-style-type: none"> b.1. at a recognised maritime training institution, and/or b.2. concurrently with practical assessment <ul style="list-style-type: none"> b.2.1. at a recognised maritime training institution through practical exercises and case studies that suitably-simulate the operation of main and ancillary machinery, and/or associated systems, and/or b.2.2. during seetime on a working or training vessel of 3,000 kW propulsion power or more c. Approved practical assessment may occur: <ul style="list-style-type: none"> c.1.1. at a recognised maritime training institution through practical exercises and case studies that suitably-simulate the operation of main and ancillary machinery, and/or associated systems, and/or c.1.2. during seetime on a working or training vessel of 3,000kW propulsion power or more d. Assessment of competence must comply with the relevant regulatory requirements.

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	2	1	1	1

TDM MB29 01A RECOGNISE AND CORRECT DETERIORATED FITTINGS AND MACHINERY

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to recognise deteriorated fittings and machinery on a small commercial vessel, including corroded and defective fittings and machinery components, faulty and corroded pipework, and worn down tail shafts and initiate appropriate corrective action.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 2).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan and carry out maintenance procedures on fittings and machinery</p>	<ul style="list-style-type: none"> a. Checks of vessel's fittings and machinery are organised and carried out in accordance with company maintenance schedules and manufacturer's instructions b. Any deterioration of a vessel's fittings and machinery is identified and appropriate maintenance action initiated or carried out within limits of responsibility of a Marine Engine Driver (Grade 2) c. Worn fittings, equipment parts, bearings and shafts are correctly identified and appropriate action initiated for repair or replacement d. Preventative maintenance procedures are followed to reduce corrosion on fittings and machinery in accordance manufacturer's instructions e. Lubricants are applied to moving parts of vessel's fittings and machinery in accordance with manufacturer's instructions f. Faulty and corroded pipework is identified and reported for repair or replacement in accordance with procedures g. Appropriate assistance is provided to contractors carrying out maintenance work on fittings and machinery h. Records of maintenance work are completed in accordance with established procedures
<p>2. Select and use maintenance equipment and materials</p>	<ul style="list-style-type: none"> a. Tools and equipment are correctly identified and used in accordance with OH&S requirements and equipment manufacturer's instructions b. Maintenance materials are obtained, handled, prepared and applied in accordance with OH&S and pollution control requirements and manufacturer's instructions c. Defective equipment and materials are identified and reported, repaired and/or replaced as required d. Maintenance equipment is correctly cleaned and stored after use e. Unused materials are disposed of or returned to store in accordance with OH&S and pollution control requirements, established procedures and manufacturer's instructions
<p>3. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precautions and regulations are followed when correcting deteriorated fittings and machinery b. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times during the work on fittings and machinery c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Personal protection clothing and equipment is used as required during checks and repair work operations in accordance with safety regulations

Range Of Variables

RECOGNISE AND CORRECT DETERIORATED FITTINGS AND MACHINERY

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small trading vessels. b. Work is performed within operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the operation and routine servicing of the engines and propulsion system on a small vessel and the application of solutions to a defined range of servicing problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel of 750 kW propulsion power or more b. Checks and work on a vessel's fittings and machinery may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. when berthed or moored b.3. when slipped c. Checks and related work of fittings and machinery may include: <ul style="list-style-type: none"> c.1. routine checks for deterioration c.2. identification of any deterioration or wearing of a vessel's fittings and machinery c.3. identification and correction of any faults or corrosion of vessel's pipework c.4. recognition and measurement of tail shaft wear down c.5. servicing of vessel's fittings and machinery c.6. restoration of weathered surfaces c.7. application of lubricants to moving parts of vessel's equipment d. Maintenance tools and equipment may include: <ul style="list-style-type: none"> d.1. hand tools d.2. greasing and lubrication tools d.3. electric power tools such as grinders, sanders and drills, d.4. pneumatic power tools such as grinders, sanders and drills d.5. protective clothing and equipment such as: <ul style="list-style-type: none"> d.5.1. eye and ear protection d.5.2. safety boots and helmet d.5.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with vessel maintenance of small vessels a.2. OHS and pollution control regulations and procedures a.3. maintenance procedures a.4. maintenance records a.5. manufacturer's instructions, specifications and procedures a.6. Material Safety Data Sheets a.7. relevant Australian standards relevant to the maintenance of fittings and machinery onboard small vessels
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code related to the seaworthiness of vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

RECOGNISE AND CORRECT DETERIORATED FITTINGS AND MACHINERY

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Recognise and correct deteriorated fittings and machinery on a small vessel within limits of responsibility of a of a Marine Engine Driver (Grade 2) a.2. Organise and carry out routine maintenance to minimise corrosion and deterioration of fittings and machinery on a small vessel a.3. Identify typical problems related to the basic maintenance of fittings and machinery on a small vessel and take appropriate action in conjunction with crew a.4. Exercise all required safety, environmental and hazard control precautions and procedures during checking and basic maintenance operations a.5. Communicate effectively with others when carrying out maintenance procedures onboard a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of the Australian USL Code dealing with the maintenance of small vessels b. Relevant OH&S and pollution control legislation and codes of practice c. Procedures for the checking the fittings and machinery on a small vessel and carrying out related basic maintenance d. Typical problems related to the inspection and maintenance of fittings and machinery on small vessels and appropriate action and solutions e. The nature and causes of corrosion of marine surfaces and structures and the available methods for its control, including surface preparation, painting, antifouling and the use of sacrificial anodes f. Safety, environmental and hazard control precautions and procedures relevant to the checking and basic maintenance of fittings and machinery g. Principle features of the fittings and machinery found on typical small vessels h. Construction and layout of a typical small vessel, including an understanding of layouts for pipework, tail shaft assembly and installed machinery i. A basic understanding of the properties and application of materials used in small vessel construction j. Knowledge and ability to read and interpret vessel and machinery specifications, operating manuals, and specifications k. Knowledge and ability to read and interpret machinery performance readings and indications l. Knowledge and ability to read and interpret Material Safety Data Sheets
<p>4. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to recognise and correct deteriorated fittings and machinery and carry out basic maintenance to minimise corrosion and deterioration of fittings, pipework and machinery on a small vessel, and/or b. carry out checks and basic maintenance on fittings and machinery on a small operational commercial or training vessel

Evidence Guide (continued)

RECOGNISE AND CORRECT DETERIORATED FITTINGS AND MACHINERY

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. recognising and correct deteriorated fittings and machinery on a small vessel a.2. organising and carrying out preventative maintenance to minimise corrosion and deterioration of fittings and machinery on a small vessel <ul style="list-style-type: none"> a.1 applying safety precautions relevant to hull checking and basic maintenance operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of the Australian USL Code b.2 OHS and pollution control regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to routine checking and basic maintenance of fittings and machinery b.5 environmental protection procedures when carrying out maintenance operations c. Action is taken promptly to report and/or rectify problems identified during checking and basic maintenance of fittings and machinery d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDM MB31 01A ORGANISE MAINTENANCE AND REPAIRS ON A SMALL VESSEL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to organise safe maintenance and repair procedures on a small commercial vessel.

Note: Relevant State/Territory electrical licensing requirements must be fulfilled by persons carrying out installation, maintenance and repair of medium/high voltage electrical circuits and systems

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 1).

ELEMENT	PERFORMANCE CRITERIA
1. Plan and organise safe maintenance and repair procedures	<ul style="list-style-type: none"> a. Vessel maintenance and repair requirements and goals are identified and defined in accordance with established marine practice and planned maintenance procedures b. Maintenance and repair operations and functions are in accordance with company procedures c. Maintenance resources and personnel are coordinated to achieve established maintenance and repair requirements and goals in accordance with company procedures
2. Plan and prepare for statutory machinery surveys	<ul style="list-style-type: none"> a. Statutory surveys, where applicable, are organised and prepared in accordance with regulatory and class and statutory requirements b. Inspection, survey repair and maintenance procedures for hull work, propellers and shafting are organised in accordance with regulatory and survey requirements
3. Monitor the completion of maintenance and repair activities	<ul style="list-style-type: none"> a. Vessel's preventative maintenance procedures are monitored in accordance with statutory and survey requirements and company procedures b. Work to monitor the condition of the vessel's hull and water tight integrity is coordinated and carried out in accordance with procedures and regulations c. Checks of the integrity of the vessel's hull are correctly carried out including the use of a testing tank where required d. Coverage and frequency of checks on the vessel's hull complies with survey requirements and regulations e. Any deterioration of the vessel's hull or structure is examined and reported and appropriate action is initiated to fix the identified problem f. Appropriate damage control measures are implemented following hull damage to maintain watertight integrity and to control any flooding of the vessel g. Repairs and corrosion control are initiated and coordinated in accordance with established procedures h. Action is taken on reports of faults and damage to the vessel and its equipment are in accordance with procedures
4. Complete maintenance and repair documentation	<ul style="list-style-type: none"> a. Records are kept of maintenance and repair operations and machinery failure incidents b. All maintenance and repair documentation is completed in accordance with established procedures and regulations

5. Participate in the development and implementation of safety management and hazard control strategies
 - a. An appropriate contribution is made to the development of safety management strategies for vessel's maintenance and repair operations
 - b. Maintenance and repair hazards are identified and appropriate strategies established to minimise or eliminate risk to personnel, vessel and the environment
 - c. Implementation of safety, hazard minimisation and pollution control procedures and regulations are monitored in accordance with regulatory requirements and company procedures
 - d. Procedures, precautions and authorisations necessary for entry into confined spaces on a vessel are communicated to relevant maintenance personnel
 - e. Appropriate action is organised in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and personnel involved

Range Of Variables

ORGANSE MAINTENANCE AND REPAIRS ON A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the organisation of maintenance operations on a vessel and the application of solutions to a defined range of maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. The hull, structures, machinery and equipment to be maintained may include that typically found on any small commercial vessel up to 1,500 kW propulsion power b. Maintenance operations may include: <ul style="list-style-type: none"> b.1. visual inspection of equipment and systems for faults b.2. routine checks of equipment and systems in accordance with manufacturer's instructions b.3. identification of faults b.4. carrying out basic fault-finding and trouble-shooting within limits of responsibility of a Marine Engine Driver (Grade 1) b.5. carrying out basic repairs within limits of responsibility of a Marine Engine Driver (Grade 1) b.6. reporting identified faults b.7. assisting contractors c. Maintenance may be carried out on: <ul style="list-style-type: none"> c.1. hull and fittings c.2. propulsion systems and controls c.3. electrical systems and controls c.4. batteries, transformers, switchboard, lighting systems c.5. steering gear, stabilizers, bow thrusters, rudders c.6. deck machinery c.7. pumps and pumping systems c.8. auxiliary systems and controls, d. Organisation of maintenance and repair operations may be carried out <ul style="list-style-type: none"> d.1. by day or night in both normal and emergency situations d.2. under any permissible conditions of weather d.3. while underway d.4. during berthing and unberthing operations d.5. while anchored or moored d.6. during slipping e. Coordination of maintenance and repair operations may include: <ul style="list-style-type: none"> e.1. preparation of maintenance and repair schemes e.2. checks on completion of a voyage e.3. checks in anticipation of a change in sea and weather conditions e.4. organisation of statutory surveys e.5. investigating and troubleshooting identified faults e.6. completion of basic repair operations within limits of responsibility of a Marine Engine Driver (Grade 1) e.7. assistance to maintenance contractors carrying out repair and replacement activities e.8. checks during an emergency which may have caused damage or changes to the seaworthiness of the vessel e.9. completion of running logs and maintenance reports f. Propulsion plant configurations may include: <ul style="list-style-type: none"> f.1. low speed, medium and high speed diesel propulsion f.2. stern tube bearing f.3. CPP f.4. direct drive shaft f.5. diesel electric f.6. steam f.7. gas turbine f.8. reduction gears f.9. thrust blocks, detuners and shaft bearings

Range Of Variables (continued)

ORGANISE MAINTENANCE AND REPAIRS ON A SMALL VESSEL

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>g. Damage to the hull of a vessel may occur through:</p> <ul style="list-style-type: none"> g.1. collision with another vessel g.2. running aground g.3. excessive stress on a vessel's hull structure g.4. effects of heavy seas and weather conditions g.5. deterioration or corrosion of vessel's hull and structure g.6. explosion onboard the vessel g.7. fire onboard the vessel <p>h. Damage control measures in a flooding emergency may include:</p> <ul style="list-style-type: none"> h.1. use of softwood wedges and plugs to reduce water ingress h.2. erection and application of vertical shoring h.3. construction and fitting of a leak-stopping mat h.4. temporary repair of a ruptured pressurised pipe h.5. operation of a portable salvage pump <p>i. Emergencies may include:</p> <ul style="list-style-type: none"> i.1. loss of propulsion i.2. loss of electrical power i.3. loss of steerage i.4. flooding i.5. fire or explosion i.6. loss of refrigeration i.7. leaks of fuel oil, lubrication oil, steam and gas i.8. overheating and overspeed of machinery, governors, emergency trips <p>j. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> j.1. moving heavy loads in an unsafe environment j.2. unsecured machinery, components or repair equipment j.3. slippery deck j.4. welding equipment j.5. tools and implements j.6. moving and rotating machinery j.7. flammable liquids, vapours and fuel j.8. faulty machinery equipment handling equipment and lifting gear j.9. using equipment beyond safe working limits j.10. poor housekeeping procedures j.11. non-compliance with safe working procedures j.12. electrical wiring and systems j.13. faulty earthing on systems and equipment j.14. working at heights <p>k. Maintenance records may include:</p> <ul style="list-style-type: none"> k.1. a maintenance log k.2. running sheets k.3. a computer database of running information and maintenance information
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. vessel's planned maintenance system, repair procedures and instructions a.2. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.3. maintenance records a.4. vessel's survey procedures and instructions as they relate to vessel's hull and machinery a.5. vessel's safety and emergency contingency plans and procedures a.6. relevant material safety data sheets a.7. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.8. relevant sections of Australian USL Code
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of the Australian USL Code related to maintenance and repair operations and surveys on small vessels up to 1,500 kW propulsion power a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

ORGANISE MAINTENANCE AND REPAIRS ON A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Organise survey, maintenance and repair operations on a vessel up to 1,500 kW propulsion power a.2. Monitor the implementation of a safety management strategy for maintenance and repair operations on a vessel of up to 1,500 kW propulsion power a.3. Identify typical machinery maintenance and repair problems and hazards and initiate appropriate action a.4. Communicate effectively with others during the organisation of maintenance and repair operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant sections of the Australian USL Code dealing with small vessel maintenance b. Relevant OH&S and pollution control legislation and codes of practice, policies and procedures with the company requirements and established safety rules and regulations c. Established practice for organising the maintenance and repair of marine machinery, hull, structures and equipment d. Functions and responsibilities of personnel for survey, maintenance and repair operations onboard a small vessel e. Operational characteristics and performance specifications for the different types of hull, machinery and equipment usually found on a small vessel f. Procedures for carrying out machinery testing, trouble-shooting and repair as part of routine maintenance procedures within limits of responsibility of a Marine Engine Driver (Grade 1) to ensure compliance with the company and survey requirements and established safety rules and regulations g. Knowledge and ability to read and interpret vessel and machinery specifications, operational manuals, specifications and a basic understanding of simple electrical and control circuit diagrams h. Knowledge and ability to read and interpret machinery performance readings and indications i. Knowledge and ability to read and interpret Material Safety Data Sheets j. Principle features of vessel construction including a basic understanding of the properties, characteristics and application of materials and structures typically used in the construction of a small vessel and its associated operational machinery k. The nature and causes of typical machinery / equipment malfunctions and the available methods for their detection and repair, including machinery malfunction fault-finding techniques l. Typical maintenance and repair hazards and problems and appropriate preventative and remedial strategies m. Damage control measures that may be required to maintain the integrity of the hull in a range of typical emergency situations that could occur on a vessel and the specific action to be taken in the event of flooding of a vessel n. Construction, layout and subdivision requirements of a typical vessel, o. Principles and procedures to ensure the watertight integrity of a vessel's hull in both normal and emergency situations p. Safety and environmental management strategies applicable to maintenance and repair operations on a small vessel q. Basic principles of operation of : <ul style="list-style-type: none"> r.1. air-conditioning and refrigeration systems r.2. machinery lubrication r. Types of maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities s. Maritime communication techniques needed during maintenance and repair operations

Evidence Guide (continued)

ORGANISE MAINTENANCE AND REPAIRS ON A SMALL VESSEL

3. Resource implications	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to organise the maintenance and repair of the hull, structures, machinery and equipment typically found on a vessel up to 1,500 kW propulsion power; and/or b. Organise surveys, maintenance and repair operations in a range of operational situations on a commercial or training vessel up to 1,500 kW propulsion power
4. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 organising survey, maintenance and repair operations a.2 checking operational capability of vessel's hull, fittings, machinery and equipment a.3 identifying vessel's machinery malfunctions and faulty plant and equipment and initiating appropriate action to minimise any damage and pollution that could be caused a.4 identifying and implementing improvements to mechanical and electrical machinery and equipment checking, maintenance and repair procedures a.5 contributing to the establishment of safety management strategies relevant to maintenance and repair operations a.6 completing machinery maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 issue resolution procedures b.4 managing waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify faults or damage to the hull or machinery d. Work is completed systematically with required attention to detail
a. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	2	2	2	2	2

TDM MB35 01A EMPLOY DAMAGE CONTROL TECHNIQUES FOR HULL DAMAGE

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to implement correct damage control procedures following damage to a small commercial vessel's hull.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 1).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Monitor the condition of the vessel</p>	<ul style="list-style-type: none"> a. Work to monitor the condition of the vessel's hull and water tight integrity is planned and carried out in accordance with company procedures and established safety rules and regulations b. Coverage and frequency of checks and inspections on the vessel's hull complies with the company procedures and established safety rules and regulations c. Action taken in anticipation of environmental changes is timely and appropriate to the change d. Degree of vessel security is commensurate with anticipated weather and sea conditions and necessary vessel operations e. Action taken in emergency situations is appropriate to the significance of the situation and designed to maximise watertight integrity f. Precautions are taken to ensure that vessel and on-board powered equipment is operated in accordance with manufacturer's instructions and codes of safe working practice
<p>2. Rectify identified problems with the condition of the vessel</p>	<ul style="list-style-type: none"> a. Any deterioration of the vessel's hull, structure or fitting is examined and reported and appropriate action is initiated to fix the identified problem b. Appropriate damage control measures are implemented following hull damage to maintain watertight integrity and to control any flooding of the vessel in accordance with established marine practice and vessel's emergency and safety management plans c. Repairs and corrosion control are initiated and coordinated in accordance with company procedures and vessel and equipment manufacturer's instructions d. Communication with others concerning the condition of the hull and the seaworthiness of the vessel and related action is clear, concise and made at an appropriate time and place e. Records on problems identified and actions taken to carry out repairs and corrosion control and to ensure watertight integrity are complete, accurate and comply with statutory, commercial and company requirements.

Range Of Variables

EMPLOY DAMAGE CONTROL TECHNIQUES FOR HULL DAMAGE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations including the relevant sections of the Australian Uniform Shipping Laws (USL) Code. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. c. Work involves application of established marine techniques for the damage control of a damaged hull on a small vessel and the application of solutions to a defined range of unpredictable hull damage situations. Planning and administering the damage control procedures is required. d. Work requires the exercise of some discretion and responsibility for the management of damage control measures in the event of damage to the hull of a small vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian commercial vessel up to 1,500 kW propulsion power b. Damage control measures may need to be exercised: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of sea, weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Damage to the hull of a vessel may occur through: <ul style="list-style-type: none"> c.1. collision with another vessel c.2. running aground c.3. excessive stress on a vessel's hull structure c.4. effects of heavy seas and weather conditions c.5. deterioration or corrosion of vessel's hull and structure c.6. explosion onboard the vessel c.7. fire onboard the vessel c.8. failure of pressurised pipes d. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> d.1. use of softwood wedges and plugs to reduce water ingress d.2. application of shoring techniques d.3. construction and fitting of a leak-stopping mat d.4. temporary repair of a ruptured pressurised pipe d.5. operation of portable salvage pumps e. Action taken to monitor the condition and seaworthiness of a vessel may include: <ul style="list-style-type: none"> e.1. routine inspections e.2. checks prior to departure e.3. checks on completion of a voyage e.4. checks on completion of maintenance activities e.5. checks in anticipation of a change in sea and weather conditions e.6. use of testing tanks to check watertight integrity e.7. checks during an emergency which may have caused damage or changes to the seaworthiness of the vessel f. Repairs and maintenance procedures may include: <ul style="list-style-type: none"> f.1. repairs to equipment, components, hull and vessel's structure f.2. basic surface repairs f.3. replacement of faulty equipment or components
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. vessel's damage control and emergency procedures a.2. ship's log a.3. company procedures for monitoring of the condition and seaworthiness of vessel a.4. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.5. maintenance schedules and records a.6. relevant sections of the Australian USL Code and IMO STCW Conventions and Codes a.7. instructions of relevant Maritime Authorities related to the seaworthiness of vessels a.8. relevant Australian and international standards

Range Of Variables (continued)

EMPLOY DAMAGE CONTROL TECHNIQUES FOR HULL DAMAGE

4. **Applicable International, Australian and State/Territory regulations and legislation**
 - a. Applicable procedures and codes may include
 - a.1. sections of Australian USL Code related to the seaworthiness of vessels
 - a.2. relevant sections of AMSA Marine Orders related to the seaworthiness of vessels
 - a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

EMPLOY DAMAGE CONTROL TECHNIQUES FOR HULL DAMAGE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor and evaluate the condition of the hull and the seaworthiness of a small vessel under normal and emergency situations a.2. Identify any damage or deterioration of the vessel's hull, structure or related equipment a.3. Take appropriate preventative and remedial action to maintain the security and watertight integrity of the vessel's hull a.4. Initiate and coordinate measures to control any damage to the hull of a small vessel in accordance with company procedures and manufacturer's instructions a.5. Identify typical problems related to the seaworthiness of a vessel and take appropriate action in conjunction with others a.6. Exercise all required safety, environmental and hazard control precautions and procedures during damage control operations a.7. Communicate effectively with others when taking action to maintain the seaworthiness of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of the IMO STCW Convention and Codes and AMSA Marine Orders dealing with the seaworthiness of vessels and damage control in the event of damage to a vessel's hull b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. Typical procedures for the checking and inspecting a vessel's seaworthiness to ensure compliance with the company procedures and established safety rules and regulations d. Damage control measures that may be required to maintain the integrity of the hull in a range of typical emergency situations that could occur on a vessel and the specific action to be taken in the event of flooding of a vessel e. Typical construction features and materials and stress characteristics for small vessels of up to 1,500 kW propulsion power f. Typical procedures for the initiation and coordination of repair and/or replacement procedures on board vessels g. Typical corrosion control measures including surface preparation and painting and antifouling h. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations i. Principle features of the structure of a vessel j. A basic understanding of the properties and application of materials used in vessel construction k. Construction, layout and subdivision requirements of a typical vessel, including and understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments and the bulkhead of the vessel l. Principles and procedures to ensure the watertight integrity of a vessel's hull in both normal and emergency situations m. Maritime communication techniques needed when monitoring the condition of a vessel and taking any related action n. Types of records that must be maintained regarding hull damage incidents and inspections of the seaworthiness of a vessel to meet the requirements of the company and regulatory authorities
<p>4. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to monitor hull condition and carry out damage control measures in the event of hull damage on a small vessel, and/or b. assist in maintaining the hull integrity and seaworthiness of a vessel in a range of operational situations either: <ul style="list-style-type: none"> b.1. using an appropriate simulator over an appropriate range of simulated hull damage situations b.2. in appropriate practical real or simulated situations on an operational small commercial or training vessel up to 1,500 kW propulsion power

Evidence Guide (continued)

EMPLOY DAMAGE CONTROL TECHNIQUES FOR HULL DAMAGE

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out routine and emergency monitoring of a vessel's hull and seaworthiness a.2 identifying and evaluating problems concerning the condition of a vessel and the integrity of its hull and determining an appropriate courses of action a.3 initiating and coordinating any required repair or maintenance activities to ensure the seaworthiness of a vessel a.4 applying safety precautions relevant to monitoring, repair and maintenance operations a.5 identifying and implementing improvements to procedures for monitoring the condition of the hull and the seaworthiness of a vessel <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 issue resolution procedures b.4 job procedures and work instructions b.5 relevant vessel manufacturer's guidelines relating to the seaworthiness the vessel b.6 quality procedures (where existing) b.7 procedures to protect the integrity and security of the vessel's hull <p>c. Action taken promptly to report and/or rectify problems with the seaworthiness of a vessel and the integrity of its hull in accordance with manufacturer's instructions, statutory requirements and company procedures</p> <p>d. Recognises and adapts appropriately to cultural differences on board vessel in behaviour and interactions among officers, crew and passengers, where relevant</p> <p>e. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MB36 01A PREPARE A SMALL VESSEL'S MACHINERY FOR SEA

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to prepare a small commercial vessel's machinery for sea, including the start up and shut down of the main propulsion and auxiliary machinery and associated systems.

The unit is consistent with the sections of the Australian USL dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Prepare the start up of main and auxiliary machinery</p>	<ul style="list-style-type: none"> a. Method of preparing the start up of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions b. Procedures for making available fuels, lubricants, cooling water and air for the start up of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions c. Required precautions are taken prior to start up of main propulsion and auxiliary machinery to minimise and control hazards and operational risks d. Problems with the start up of main propulsion and auxiliary machinery are identified and investigated and appropriate action is initiated to rectify any problems that occur e. Where applicable, petrol driven outboard engines are prepared for operation in accordance with manufacturer's instructions
<p>2. Start up and warm up main propulsion and auxiliary machinery</p>	<ul style="list-style-type: none"> a. Main propulsion and auxiliary machinery is started up and warmed up accordance with manufacturers' specifications and instructions and established marine practice b. Sequence and timing of start up and shut down of main propulsion and auxiliary machinery is appropriate for safe and efficient operation c. Checks of pressures, temperatures, and revolutions during the start up and warm up period are made in accordance with manufacturers' technical specifications and appropriate action is initiated when out of specified limits d. Main propulsion and auxiliary machinery is operated within manufacturer's recommended limits e. Running and maintenance logs are maintained in accordance with procedures and manufacturers' specifications and instructions f. Where applicable, petrol driven outboard engines are operated in accordance with manufacturer's instructions
<p>3. Prepare and shut down of main propulsion and auxiliary machinery</p>	<ul style="list-style-type: none"> a. Method of preparing the shut down of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions b. Required precautions are taken prior to shut down of main propulsion and auxiliary machinery to minimise and control hazards and operational risks c. Problems with the shut down of main propulsion and auxiliary machinery are identified and investigated and appropriate action is initiated to report and rectify the problems d. Where applicable, petrol driven outboard engines are shut down in accordance with manufacturer's instructions e. The cooling down of the engine is monitored in accordance with manufacturers' specifications and instructions

Range Of Variables

PREPARE A SMALL VESSEL'S MACHINERY FOR SEA

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Preparation must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code b. Preparation is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required, including the application of solutions to a variety of predictable maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel b. The main propulsion and auxiliary machinery and associated systems may be started up and shut down <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. during berthing and unberthing operations b.4. while anchored or moored c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. medium and high speed diesel propulsion c.2. petrol driven outboard engine c.3. reduction gears c.4. thrust blocks and shaft bearings d. Auxiliary machinery and associated systems may include: <ul style="list-style-type: none"> d.1.1. fresh and salt water cooling systems d.1.2. fuel system d.1.3. lubricating oil cooling systems d.1.4. lubrication systems d.1.5. onboard air compressors and compressed air and control air systems d.1.6. waste management and pollution control systems as per the MARPOL Convention d.1.7. pumps and associated systems d.1.8. fixed fire fighting installations and fire control systems
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Australian USL Code a.2. company procedures for the start up and shut down of machinery a.3. running and maintenance logs a.4. machinery manufacturer's start up and shut down instructions and specifications
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code related to the operation and maintenance of machinery on small vessels a.2. relevant OH&S and pollution control legislation

Evidence Guide

PREPARE A SMALL VESSEL'S MACHINERY FOR SEA

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <p>a.1. Prepare a small vessel's machinery for sea including the start up and shut down of the main propulsion and auxiliary machinery and associated systems typically found on a small commercial vessel</p> <p>a.2. Exercise all required safety, environmental and hazard control precautions and procedures when starting up and shutting down the main propulsion and auxiliary machinery and associated systems</p> <p>a.3. Communicate effectively with others during start up and shut down operations</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<p>a. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures</p> <p>b. Procedures for the start up and shut down of main propulsion and auxiliary machinery and associated systems on a small commercial vessel, (including petrol-driven outboard motors)</p> <p>c. Operational characteristics and performance specifications for the various types of main propulsion and auxiliary machinery and associated systems found on small commercial vessels</p> <p>d. The nature and causes of start up and shut down malfunctions of main propulsion and auxiliary machinery and associated systems and the available methods for their detection and rectification</p> <p>e. Safety, environmental and hazard control precautions and procedures relevant to the start up and shut down of main propulsion and auxiliary machinery and associated systems</p> <p>f. Basic principles of engines and propulsion systems used on a small commercial vessel, including basic theory of:</p> <p>f.1. internal combustion engines</p> <p>f.2. fuel systems</p> <p>f.3. engine cooling and lubrication</p> <p>g. Types of operational and maintenance records that must be maintained on a small vessel</p> <p>h. Knowledge and ability to read and interpret material safety data sheets</p> <p>i. Knowledge and ability to read and interpret machinery performance readings and indications</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to</p> <p>a.1. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to start up and shut down the main propulsion and auxiliary machinery and associated systems typically found on a small commercial vessel; and/or</p> <p>a.2. Start up and shut down the main propulsion and auxiliary machinery and associated systems in a range of operational situations on a small commercial or training vessel</p>

Evidence Guide (continued)

PREPARE A SMALL VESSEL'S MACHINERY FOR SEA

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. starting up and shutting down the main propulsion and auxiliary machinery and associated systems found on a small commercial vessel a.2. identifying problems and hazards with the start up and shut down of the main propulsion and auxiliary machinery and initiating appropriate action for rectification a.3. exercising all required safety, environmental and hazard control precautions and procedures when starting up and shutting down the main propulsion and auxiliary machinery and associated systems a.4. communicating effectively with others during start up and shut down operations a.5. applying safety precautions relevant to start up and shut down operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. OHS regulations and hazard prevention policies and procedures b.3. following on-board housekeeping processes b.4. waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify machinery malfunctions d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MB37 01A FABRICATE SIMPLE SHIPBOARD COMPONENTS

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to fabricate simple shipboard components where required as part of maintenance of shipboard machinery on commercial vessels powered by main propulsion machinery of less than 3,000 kW of propulsion power within offshore limits.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of an Engineer (Class 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Obtain specifications and drawing for component</p>	<ul style="list-style-type: none"> a. The specifications and drawings for a simple component are obtained or sketched in accordance with established procedures b. The specifications and drawings are interpreted and the processes for the fabrication and assembly of the component are planned in accordance with the limits of responsibility of an Engineer (Class 3) c. Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions d. Faulty equipment and components are identified and are reported and appropriate action is initiated as required for isolation, tagging and repair or replacement within the limits of responsibility of an Engineer (Class 3) e. Decisions made to carry out temporary or permanent repairs depending on the vessel's position and circumstances f. Appropriate consultation taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required g. Management of the repair processes and the organisation and control of engine room personnel to facilitate repairs is carried out within the limits of responsibility of an Engineer (Class 3)
<p>2. Fabricate required component</p>	<ul style="list-style-type: none"> a. Materials and equipment for the planned fabrication processes are selected and obtained b. Materials are laid out and marked up in accordance with plans and specifications c. Equipment and tools to carry out the fabrication processes are prepared and set up in accordance with manufacturer's instructions and established procedures d. Materials are cut to specifications in accordance with planned procedures e. Planned fabrication and assembly processes are carried out within the limits of responsibility of an Engineer (Class 3) f. Fabricated component is checked against specifications g. Equipment and unused materials are returned to store after completion of the fabrication tasks h. Housekeeping of the work area is completed in accordance with established procedures
<p>3. Complete documentation</p>	<ul style="list-style-type: none"> a. Details of the fabrication project are documented in accordance with established maintenance procedures
<p>4. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times during fabrication activities b. Fabrication hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment

Range Of Variables

FABRICATE SIMPLE SHIPBOARD COMPONENTS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed to established procedures under broad operational requirements within the limits of responsibility of an Engineer (Class 3). c. Work involves the application of marine engineering practice to the fabrication of simple shipboard components. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires skill to carry out basic engineering fabrication functions. This includes interpretation of specifications and the planning, implementation and checking of fabrication processes.
2. Worksite environment	<ul style="list-style-type: none"> a. Components to be fabricated may include simple components involving processes falling within the limits of responsibility of an Engineer (Class 3) on commercial vessels of up to 3,000 kW propulsion power operating within offshore limits b. Fabrication tasks may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any conditions of weather b.3. while underway b.4. while anchored or moored b.5. in dry dock b.6. when bunkering b.7. during cargo operations c. Fabrication tasks are dependent on the type and size of vessel involved and may include: <ul style="list-style-type: none"> c.1. selection of appropriate materials c.2. use of hand and power tools c.3. marking out and cutting of materials c.4. bending and folding of materials c.5. basic machining (where relevant) c.6. basic welding c.7. basic heat treatment c.8. checking and quality assurance d. Fabrication tools and equipment may include: <ul style="list-style-type: none"> d.1. hand and power tools d.2. measurement and marking out tools d.3. cutting, bending and folding tools d.4. machine tools d.5. basic welding equipment d.6. lifting gear and equipment d.7. protective clothing and equipment such as: <ul style="list-style-type: none"> d.7.1. eye and ear protection d.7.2. safety boots and helmet d.7.3. dust and fume masks e. Fabrication hazards may include: <ul style="list-style-type: none"> e.1. moving heavy loads using unsafe lifting procedures e.2. welding equipment e.3. sharp tools and implements e.4. power tools e.5. moving and rotating machinery e.6. flammable liquids, vapours and fuel e.7. faulty load handling equipment and lifting gear e.8. using tools and equipment beyond safe working limits e.9. poor housekeeping procedures e.10. non-compliance with safe working procedures e.11. hot and cold pipes and valves (steam, fuel oil, lubricating oil, refrigeration)

Range Of Variables (continued)

FABRICATE SIMPLE SHIPBOARD COMPONENTS

VARIABLE	SCOPE
3. Sources of information / documents	<ul style="list-style-type: none">a. Documentation / records may include<ul style="list-style-type: none">a.1. ISM Code safety management system plans, procedures, checklists and instructionsa.2. maintenance log sheets and records, including computer database of maintenance recordsa.3. machinery and vessel manufacturer's specifications, instructions and recommended proceduresa.4. instructions of relevant Maritime Authorities concerning shipboard machinery maintenance and repaira.5. relevant Australian engineering standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none">a. Applicable procedures and codes may include<ul style="list-style-type: none">a.1. sections of relevant maritime regulations dealing with maintenance of vessels of less than 3,000 kW propulsion powera.2. relevant Australian and State/Territory OH&S legislationa.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

FABRICATE SIMPLE SHIPBOARD COMPONENTS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Interpret specifications and drawings for the fabrication of simple shipboard components a.2. Plan the processes for the fabrication of simple shipboard components a.3. Carry out planned processes for the fabrication of simple shipboard components in accordance with the limits of responsibility of an Engineer (Class 3) a.4. Exercise all required safety, environmental and hazard control precautions and procedures when completing fabrication tasks
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other competency units that form part of the job role of an Engineer (Class 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Established engineering practice for the fabrication of simple shipboard components d. Simple shipboard components that may need to be fabricated by an Engineer (Class 3) on a vessel of less than 3,000 kW propulsion power operating within offshore limits e. Skills and knowledge required to carry out basic fabrication tasks procedures falling within limits of responsibility of an Engineer (Class 3), including: <ul style="list-style-type: none"> e.1. use of hand and power tools e.2. measurement and marking out of work e.3. cutting materials e.4. bending and folding sheet metal e.5. use of machine tools e.6. oxy-welding and MIG welding e.7. brazing techniques f. Fabrication hazards and problems and appropriate preventative and remedial action and solutions g. Safe procedures for handling heavy loads during fabrication processes h. Safe procedures for the use of hand and power tools and maintenance equipment during Fabrication processes i. Safety, environmental and hazard control precautions and procedures relevant to shipboard maintenance operations j. A basic understanding of the properties and application of materials and structures used in the construction of various vessels of less than 3,000 kW propulsion power and their associated operational machinery k. Mathematical techniques to solve basic engineering and maintenance problems procedures falling within limits of responsibility of an Engineer (Class 3) l. Basic properties of common marine engineering materials and methods of cutting and joining. m. Precautions that must be taken to minimise danger of fire or explosion when carrying out basic fabrication tasks on a vessel n. Principles and procedures for the alignment of machinery and machinery parts. o. Safety precautions that must be taken before entering tanks or confined spaces p. Maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities q. Maritime communication techniques needed during maintenance and repair operations r. Knowledge and ability to read and interpret material safety data sheets s. Knowledge and ability to read and interpret vessel and machinery specifications, machinery drawings, operational manuals and specifications and electrical and control circuit diagrams
<p>3. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to fabricate simple components within the limits of responsibility of an Engineer (Class 3) on a vessel of less than 3,000kW propulsion power operating within offshore limits; and/or b. Fabricate an range of simple components on a commercial or training vessel of less than 3,000kW propulsion power operating within offshore limits

Evidence Guide (continued)

FABRICATE SIMPLE SHIPBOARD COMPONENTS

<p>4. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. interpreting specifications and drawings for the fabrication of simple shipboard components a.2. planning the processes for the fabrication of simple shipboard components a.3. carrying out planned processes for the fabrication of simple shipboard components in accordance with the limits of responsibility of an Engineer (Class 3). a.4. applying safety precautions relevant to mechanical and electrical machinery and equipment maintenance and repair operations a.5. completing mechanical and electrical machinery and equipment maintenance and repair documentation and records <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. OHS and pollution control regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions for maintenance and fabrication activities b.4. following on-board housekeeping processes b.5. waste, pollution and recycling management processes <p>c. Work is managed, controlled and completed systematically with required attention to detail</p>
<p>5. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB38 01A DISMANTLE, INSPECT, REPAIR AND REASSEMBLE VESSEL MACHINERY

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to dismantle, inspect, repair and reassemble machinery as may be required on commercial vessels powered by main propulsion machinery of less than 3,000 kW of propulsion power within offshore limits.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of an Engineer (Class 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Investigate machinery malfunctions and faults</p>	<ul style="list-style-type: none"> a. Reported poor performance and malfunctions of machinery are investigated in accordance with manufacturer's instructions and appropriate action initiated to rectify the identified problem within the limits of responsibility and skill of an Engineer (Class 3) b. Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, safety regulations and manufacturer's instructions c. Faulty equipment and components are identified and are reported and appropriate action is initiated as required for isolation, tagging and repair or replacement within the limits of responsibility of an Engineer (Class 3) d. Planning of the repair processes and the organisation of the repairs is carried out within the limits of responsibility of an Engineer (Class 3) and in consultation with other relevant engineering personnel, where applicable
<p>2. Dismantle inspect and repair vessel machinery</p>	<ul style="list-style-type: none"> a. Machinery is dismantled in accordance with manufacturer's instructions and planned procedures b. Machinery parts and components are inspected for damage and malfunction using established procedures c. Damaged or faulty components are identified and repaired or replaced within the limits of responsibility and skill of an Engineer (Class 3) and in accordance with company planned maintenance system or procedures and manufacturer's instructions
<p>3. Re-assemble and check repaired machinery</p>	<ul style="list-style-type: none"> a. Repaired machinery is re-assembled in accordance with manufacturer's instructions and established procedures b. Assembled machinery is checked and tested against manufacturer's specifications c. Repaired machinery is re-started and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel d. Performance of repaired machinery and associated safety devices, control systems and alarms, where relevant, is tested in accordance with manufacturer's instructions e. Performance against recommended performance specifications is confirmed and the machinery is re-commissioned in accordance with vessel's procedures
<p>4. Complete maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to maintenance and repair operations and machinery failure incidents b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations

5. **Follow safety and hazard control procedures**

- a. Tests, inspections and repairs of vessel machinery and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures
- b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment
- c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations
- d. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed
- e. Action is taken in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and persons involved and shipboard emergency and contingency plans followed

Range Of Variables

DISMANTLE, INSPECT, REPAIR AND REASSEMBLE VESSEL MACHINERY

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed under broad guidelines, with accountability and responsibility for self and others in achieving the prescribed outcomes within the limits of responsibility and skill of an Engineer (Class 3). It involves the application of marine engineering practice to the dismantling, inspecting, repair and re-assembly of machinery typically found on a vessel of less than 3,000 kW propulsion power across a range of machinery malfunctions or faults. Implementation of a broad plan or strategy for shipboard machinery maintenance and repair is required and accountability and responsibility for self and others in achieving the outcomes is involved. c. Work requires some judgement in planning and carrying out machinery repair operations and procedures. This includes analysis of the faulty machinery and decision making on the repairs required and the processes to be used.
2. Worksite environment	<ul style="list-style-type: none"> a. Machinery may include that typically found on any Australian or international commercial vessel of up to 3,000 kW propulsion power operating within offshore limits b. Machinery performance monitoring and repair may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of machinery may include: <ul style="list-style-type: none"> c.1. steam, diesel, diesel electric and gas turbine propulsion systems and controls c.2. electrical systems and controls including primemovers (where relevant) c.3. batteries, transformers, switchboard, distributions systems, lighting systems c.4. steering gear, stabilizers, bow thrusters, rudders c.5. fluid power systems and controls c.6. deck machinery c.7. pumps and pumping systems c.8. auxiliary systems and controls, including <ul style="list-style-type: none"> c.8.1. fresh and salt water cooling systems c.8.2. lubricating oil cooling systems c.8.3. fuel, oil, gas, coal systems and centrifuges c.8.4. air compressor and air starting systems c.8.5. lubrication c.8.6. bilge and ballast system, oily water separator c.8.7. refrigeration and air-conditioning plant and equipment c.8.8. onboard air compressors and compressed air and control air systems c.8.9. waste management and pollution control systems as per the MARPOL Convention c.8.10. evaporators c.8.11. inert gas generator c.8.12. cargo pumps, tank washing machines and associated systems c.8.13. purifiers and clarifiers c.8.14. heaters c.8.15. sewage plant c.8.16. fixed fire fighting installations and fire control systems c.8.17. auxiliary boilers and waste heat generators c.8.18. life saving appliances c.8.19. maintenance to hull and vessel side valves

Range Of Variables (continued)

DISMANTLE, INSPECT, REPAIR AND REASSEMBLE VESSEL MACHINERY

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>d. Propulsion plant configurations may include:</p> <ul style="list-style-type: none"> d.1. low speed, medium and high speed diesel propulsion d.2. stern tube bearing d.3. CPP d.4. direct drive shaft d.5. diesel electric d.6. steam d.7. gas turbine d.8. water jets and control systems d.9. reduction gears d.10. thrust blocks, detuners and shaft bearings <p>e. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> a.1. meters and gauges a.2. computer displays of performance parameters a.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. a.4. greasing and lubrication tools a.5. electric power tools, such as grinders, lathes, drills, etc. a.6. pneumatic power tools, such as grinders, sanders, drills, etc. a.7. welding equipment a.8. block and tackle a.9. portable and manual lifting equipment and hydraulic jacks a.10. material safety data sheets a.11. protective clothing and equipment such as: <ul style="list-style-type: none"> a.11.1. eye and ear protection a.11.2. safety boots a.11.3. dust and fume masks <p>f. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> f.1. moving heavy loads using unsafe lifting procedures f.2. unsecured machinery, components or repair equipment f.3. slippery deck f.4. welding equipment f.5. sharp tools and implements f.6. power tools f.7. moving and rotating machinery f.8. flammable liquids, vapours and fuel f.9. faulty machinery equipment handling equipment and lifting gear f.10. using equipment beyond safe working limits f.11. poor housekeeping procedures f.12. non-compliance with safe working procedures f.13. electrical wiring and systems f.14. hot pipes and valves (steam, fuel oil, lubricating oil) f.15. cold pipes and valves (refrigeration and liquefied gas cargoes) f.16. working at heights <p>g. Emergencies may include:</p> <ul style="list-style-type: none"> g.1. loss of propulsion g.2. loss of electrical power g.3. loss of engine and/or transmission control g.4. loss of steerage g.5. flooding of engine room g.6. fire or explosion in engine room g.7. loss of refrigeration g.8. loss of water making ability g.9. fuel oil, lubrication oil, steam and gas leaks g.10. overheating and overspeed of machinery, governors, emergency trips

Range Of Variables (continued)

DISMANTLE, INSPECT, REPAIR AND REASSEMBLE VESSEL MACHINERY

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. vessel and company's planned maintenance system, repair procedures and instructions a.2. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.3. maintenance log, running sheets and records a.4. computer database of running information and maintenance records a.5. vessel's survey as it relates to shipboard machinery a.6. vessel's safety and emergency contingency plans and procedures a.7. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.8. relevant maritime regulations a.9. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of relevant maritime regulations, including sections of the Australian USL Code related to shipboard machinery maintenance and repair on vessels of less than 3,000 kW propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

DISMANTLE, INSPECT, REPAIR AND REASSEMBLE VESSEL MACHINERY

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Investigate machinery malfunctions and faults a.2. Dismantle inspect and repair vessel machinery within the limits of responsibility and skill of an Engineer (Class 3) a.3. Re-assemble and check repaired machinery a.4. Complete maintenance and repair documentation a.5. Exercise all required safety, environmental and hazard control precautions and procedures when carrying out maintenance and repair of shipboard machinery a.6. Identify machinery maintenance and repair problems and hazards and take appropriate action a.7. Communicate effectively with others during maintenance and repair operations a.8. Ensure adherence to national and international regulations, IMO Conventions and Codes (where applicable)
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S and pollution control legislation and policies c. Established engineering practice for the checking, maintenance and repair of marine machinery on commercial vessels of less than 3,000 kW propulsion power operating within offshore limits, including: <ul style="list-style-type: none"> c.1. fitting c.2. machining c.3. gas cutting and welding c.4. arc welding c.5. workshop practice d. Operational characteristics and performance specifications for the different types of shipboard machinery usually found on vessels of less than 3,000 kW propulsion power e. Procedures for carrying out shipboard machinery testing, trouble-shooting and repair as part of routine maintenance procedures falling within the limits of responsibility and skills of an Engineer (Class 3) f. The nature and causes of shipboard machinery malfunctions and the available methods for their detection and repair, including marine machinery malfunction fault-finding techniques g. Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions h. Safe procedures for handling heavy machinery and component parts during maintenance and repair of shipboard machinery i. Safe procedures for the use of hand and power tools and maintenance equipment during maintenance and repair of shipboard machinery j. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock k. Safety, environmental and hazard control precautions and procedures relevant to shipboard machinery inspection and maintenance operations l. Principle features of vessel construction and basic principles of transverse stability m. A basic understanding of the properties and application of materials and structures typically used in the construction of a vessel of less than 3,000 kW propulsion power and its associated operational machinery n. Types of maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities o. Maritime communication techniques needed during maintenance and repair operations p. Knowledge and ability to read and interpret material safety data sheets q. Procedures for the testing of boiler water, machinery cooling water and lubricating oil r. Knowledge and ability to read and interpret machinery performance readings and indications

Evidence Guide (continued)

DISMANTLE, INSPECT, REPAIR AND REASSEMBLE VESSEL MACHINERY

3. Required knowledge and skills
(continued)
- s. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams
 - t. Mathematical techniques required to solve engineering problems falling within the limits of responsibility of an Engineer (Class 3)
 - u. Basic properties of common marine engineering materials and principles and methods of cutting, joining and heat treatment.
 - v. Basic properties of liquids and gases commonly used aboard vessels.
 - w. Principles and precautions that must be taken when carrying out 'hot work'
 - x. Precautions that must be taken to minimise danger of fire or explosion.
 - y. safety precautions that must be taken before entering tanks or confined spaces
 - z. Principles and procedures of machinery lubrication, including:
 - z.1. theory and types of lubrication
 - z.2. relative characteristics, and applications of mineral and synthetic oils
 - z.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - aa. Basic principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery, including:
 - aa.1. statics (non-concurrent systems only)
 - aa.2. friction
 - aa.3. dynamics
 - aa.4. balancing
 - aa.5. radial, circumferential and, longitudinal stress
 - aa.6. shear stress
 - aa.7. fluid mechanics
 - aa.8. torsion, hollow and solid shafts
 - aa.9. loads due to liquid head
 - bb. Basic principles of transverse stability and principles of naval architecture and vessel construction relevant to detection, identification and repair of faults, including:
 - bb.1. draught, trim and heel
 - bb.2. propellers
 - bb.3. structural strength and vibration of vessels
 - bb.4. vessel measurement and classification
 - bb.5. load line
 - bb.6. basic principles of transverse stability
 - bb.7. principles of free surface effects
 - bb.8. drydocks
 - bb.9. lifesaving equipment
 - bb.10. hull repairs and maintenance
 - cc. Basic principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:
 - cc.1. heat transfer
 - cc.2. gases
 - cc.3. properties and expansion of steam
 - cc.4. steam cycles
 - cc.5. boilers and evaporators
 - cc.6. steam turbines
 - cc.7. combustion
 - cc.8. refrigeration and air conditioning.
 - dd. The construction features of a ship that impact on its watertight integrity and stability.
 - ee. Principles involved in the alignment of machinery and machinery parts.
 - ff. Elementary principles and care and management of the various types of auxiliary pumps and pumping and piping systems and other shipboard auxiliaries.
 - gg. The basic principles of engine cooling, fuel and lubricating systems and fuel consumption.
 - hh. The basic principles of air compressors, their care and maintenance.
 - ii. The basic principles of operation and safety of boilers, steam and feed systems, steam engines and turbines.
 - jj. The colour coding system used for electric conductors.
 - kk. Definitions of electrical terms and solve basic electrical problems using mathematics.

Evidence Guide (continued)

DISMANTLE, INSPECT, REPAIR AND REASSEMBLE VESSEL MACHINERY

3 Required knowledge and skills (continued)	<ul style="list-style-type: none"> ll. The basic principles of operation and operating procedures for A.C. and D.C. generators. mm. Basic principles of preventative and remedial maintenance nn. Basic principles of the operation and maintenance of two and four stroke compression ignition engines, including engine construction and starting and reversing systems oo. Safety precautions and procedures during repair and inspection of electrical circuitry and equipment. pp. Basic principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults falling within the limits of responsibility of an Engineer (Class 3), including: <ul style="list-style-type: none"> pp.1. the electric circuit pp.2. electrolytic action and cells pp.3. basic principles of relevant AC and DC machines pp.4. cabling, distribution and lighting systems pp.5. control gear pp.6. switch gear pp.7. deck machinery
4. Resource implications	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to check and repair machinery and equipment typically found on a commercial vessel of less than 3,000kW propulsion power, including the ability to identify an appropriate range of possible machinery malfunctions and carry out related maintenance and repair solutions; and/or b. Carry out checks and related repairs of shipboard machinery in a range of operational situations on a commercial or training vessel less than 3,000 kW propulsion power
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. investigating machinery malfunctions and faults a.2. dismantling, inspecting and repairing vessel machinery a.3. re-assembling and checking repaired machinery a.4. completing maintenance and repair documentation a.5. applying safety precautions relevant to mechanical and electrical machinery and equipment maintenance and repair operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. OHS regulations pollution control and hazard prevention policies and procedures b.3. work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations b.4. machinery security procedures b.5. following on-board housekeeping processes b.6. waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify machinery malfunctions and safety incidents in accordance with regulations, procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	2	2	3

TDM ME1 01A UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

Field E Communication

DESCRIPTION:

This unit involves the skills and knowledge to communicate effectively with others in the course of shipboard duties on board a commercial vessel, including understanding and interpreting orders.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers under the STCW Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Communicate with officers, crew and others in performing duties</p>	<ul style="list-style-type: none"> a. Orders are attended to, interpreted and implemented in accordance with established nautical practice b. Effective listening skills are demonstrated c. Questions are used to gain additional information d. Verbal and written communication with others in the performance of duties is clear and precise and uses the standard nautical vocabulary and follows established communications practice e. Misunderstandings in communications are avoided using appropriate confirmation techniques and established communications practice f. Appropriate techniques are used when communicating with others in multilingual crew to ensure that communications are effective and messages are clearly understood g. Various forms of non-verbal communication are appropriately used when working and communicating with others in the course of shipboard duties
<p>2. Participate in group discussions to achieve appropriate work outcomes</p>	<ul style="list-style-type: none"> a. Responses are sought and provided to others in the group b. Constructive contributions are made in terms of the process involved c. Goals or outcomes are communicated and/or recorded

Range Of Variables

UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Orders given by a master or senior officer are understood and implemented either individually or in a team environment with some accountability for the quality of outcomes. c. Work involves the use of known and prescribed communication techniques across a variety of shipboard work contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Communications may include written, verbal and non-verbal communications with crew, officers and others in the course of normal duties c. Communications may be with: <ul style="list-style-type: none"> c.1. English speaking persons c.2. multilingual crew c.3. persons with limited ability to communicate in English d. Communication problems may include: <ul style="list-style-type: none"> d.1. misunderstanding d.2. limited ability of others to communicate in English d.3. noisy environments or communications channels d.4. illegible writing or print d.5. use of non-standard vocabulary d.6. incorrect assumption that message has been received and/or correctly understood
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. Relevant sections of the IMO STCW Convention and Code and AMSA Marine Orders a.3. IMO Standard Marine Communication Phrases a.4. shipboard work instructions a.5. orders given by a master or an officer a.6. company communication procedures a.7. company directions and written procedures a.8. work and safety signs and symbols a.9. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. ISM Code a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Understand and follow orders given by a master or an officer onboard a vessel a.2. Communicate with others effectively using written, verbal and non-verbal methods a.3. Use the standard nautical vocabulary when communicating with others on-board a vessel a.4. Read and interpret signs and symbols relevant to a rating's duties a.5. Communicate effectively with others in a multilingual crew when performing rating's duties a.6. Identify typical communication problems and take appropriate action
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of maritime regulations dealing with communication onboard a vessel b. Relevant OH&S legislation, codes of practice, policies and procedures c. Maritime communication techniques including barriers to effective communication and how to overcome them d. Principles of effective communication e. Established written, verbal and non-verbal communications practices f. Standard nautical vocabulary as described in the 'IMO Standard Marine Communication Phrases' publication g. Protocols and procedures for communicating with others on-board a vessel h. Techniques for communicating effectively with other members of a multilingual crew i. Typical communication problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate performance in a range of suitably-simulated communication activities covering situations that are typically experienced on a vessel; and/or a.2. demonstrate communications skills and knowledge in an appropriate range of operational situations on board an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. communicating on board a vessel a.2. understanding and implementing orders in relation to shipboard duties a.3. identifying and evaluating communication problems and determining appropriate courses of action a.4. identifying and implementing improvements to communication methods a.5. assessing the effectiveness of communications b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2. ISM Code and associated ship's Safety Management System and procedures b.3. OHS regulations policies and procedures b.4. job procedures and work instructions c. Action taken promptly to report and/or rectify communication problems in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

6. Context for assessment

- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
- b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	1

TDM ME7 01A USE ENGLISH IN WRITTEN AND ORAL FORM TO PERFORM ENGINEERING DUTIES

Field E Communications

DESCRIPTION:

This unit involves the skills and knowledge required to use English in written and oral form to perform engineering duties on board a commercial vessel, including communicating with others, reading and interpreting engineering publications, specifications, instructions and other documents, reading and interpreting equipment performance indications, using available tools to communicate between the Bridge, Engine Control Room and Main Engine Room, and using a computer to enter and retrieve engineering information.

The unit is consistent with the related functional standard in Section A III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Read, interpret and apply information in engineering publications and documentation</p>	<p>a. Engineering publications and other documentation used when performing engineering watchkeeping duties are read and correctly interpreted and required information is extracted and appropriately applied to work activities in accordance with established marine engineering practice</p> <p>b. Information in engineering publications and other documentation used in day-to-day work is correctly accessed, read and interpreted and applied to work activities</p> <p>c. Engineering specifications and drawings are correctly read and interpreted and the information applied during engineering duties in accordance with established marine engineering practice</p>
<p>2. Obtain, interpret and apply engineering information during engineering duties</p>	<p>a. Readings on gauges, instrumentation, computer screens and other performance indicators are correctly made and interpreted</p> <p>b. Engineering information, procedures, instructions and directions are obtained, interpreted and applied in the course of engineering duties</p> <p>c. Standard drawing symbols and appropriate instrumentation and process control terms are correctly used when describing the actions and functions of marine equipment and plant</p> <p>d. Engineering drawings and control loops are correctly sketched as required in the course of typical engineering duties</p> <p>e. Engineering information is correctly entered into a computer using a keyboard and other relevant peripheral equipment</p> <p>f. Engineering information is correctly accessed and retrieved from a computer using a keyboard and other relevant peripheral equipment</p> <p>g. Engineering reports and completing running sheets and other engineering documentation relevant to the performance of engineering duties are correctly and accurately completed in English</p>
<p>3. Use tools to communicate between Bridge, Engine Control Room and Main Engine Room</p>	<p>a. The various available tools are correctly used to communicate between the Bridge, Engine Control Room and Main Engine Room</p> <p>b. Appropriate records of engineering communications are completed in accordance with company procedures and regulatory requirements</p>

4. **Communicate with officers, crew and others when performing engineering duties**
- a. Written and verbal communication with others in the performance of officer's duties is clear and precise, uses established marine engineering vocabulary and follows established communications practice
 - b. Misunderstandings in English communications are avoided using appropriate confirmation techniques and established communications practice
 - c. Messages concerning vessel safety and operations involving written or verbal communications are read or received, clarified, correctly interpreted and applied to engineering activities
 - d. Appropriate techniques are used when communicating in English with multilingual crew to ensure that communications are effective and messages are clearly understood
 - e. Training, instruction and feedback on work performance is effectively provided to engine room crew in accordance with vessel procedures and established engineering practice
 - f. Various forms of non-verbal communication are appropriately used when working and communicating with others in the course of engineering duties

Range Of Variables

USE ENGLISH IN WRITTEN AND ORAL FORM TO PERFORM ENGINEERING DUTIES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of English communications principles and established marine engineering practice to the use and interpretation of engineering publications, manuals and instructions across a wide and often unpredictable variety of operational engineering contexts onboard vessel. Defined accountability and responsibility for self and others in achieving the effective communication and understanding is involved. d. Work requires some responsibility for maintaining own ability and that of others to effectively use English in written and oral form, when performing engineering duties. This includes applications in the course of supervision and control of personnel, hazard minimisation, interpreting engineering performance of plant and equipment, and responding to operational situations and related decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Communications in English may be demonstrated during engineering duties onboard any Australian or international commercial vessel b. Effective communications in English may be required: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of sea, weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. during engineering maintenance operations b.7. when in dry dock c. Communications in English may include: <ul style="list-style-type: none"> c.1. reading and interpreting engineering publications, instruction manuals and manufacturer's specifications c.2. reading and interpreting engineering drawings and charts, including electric, electronic, pneumatic, hydraulic circuit diagrams and drawings c.3. applying standard drawing symbols together with appropriate instrumentation and process control terms when describing the actions and unctions of marine equipment and plant c.4. orally giving and receiving information, instructions and directions in the course of engineering duties c.5. writing engineering reports and completing running sheets and other engineering documentation relevant to the performance of engineering duties c.6. entering information into a computer using a keyboard and other relevant peripheral equipment c.7. retrieving and printing information from a computer using a keyboard and other relevant peripheral equipment c.8. sketching engineering drawings and engineering control loops as required in the course of typical engineering duties c.9. using the various tools available to communicate between the Bridge, Engine Control Room and Main Engine Room c.10. providing training, instruction and feedback on work performance to engine room crew

Range Of Variables (continued)

USE ENGLISH IN WRITTEN AND ORAL FORM TO PERFORM ENGINEERING DUTIES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. ship and company's planned operational and maintenance procedures and instructions a.3. ship's safety and emergency contingency plans and procedures, including relevant sections of the SOLAS Convention a.4. anti-pollution and environmental protection regulations and procedures, including relevant sections of the MARPOL Convention a.5. marine engineering publications and manuals a.6. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.7. ship's survey as it relates to shipboard plant, equipment and machinery a.8. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery maintenance and repair a.9. operational and maintenance logs, running sheets and records, including computer databases of running information and maintenance records, where relevant a.10. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery operations, maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation, maintenance and repair of shipboard plant, equipment and machinery on vessels of unlimited propulsion power a.2. MARPOL and SOLAS Conventions as they relate to engineering operations, maintenance and repair a.3. relevant international, Australian and State/Territory OH&S and anti-pollution legislation a.4. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

USE ENGLISH IN WRITTEN AND ORAL FORM TO PERFORM ENGINEERING DUTIES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Effectively and accurately communicate with others in English using written, verbal and non-verbal methods a.2. Use established marine engineering vocabulary when communicating with others onboard vessel a.3. Read and interpret engineering publications, specifications, instructions and other documents relevant to officer's duties a.4. Use available tools to communicate between the Bridge, Engine Control Room and Main Engine Room a.5. Use a computer to enter and retrieve engineering information when performing normal officer's duties a.6. Use effective communications when providing training, instruction and feedback on work performance to engine room crew a.7. Communicate effectively with multilingual crew when performing normal officer's duties a.8. Identify typical communication problems and take appropriate action
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other competency units that form part of a job role of an engineer officer on a commercial vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation, maintenance and repair of plant, machinery and equipment on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Principles of effective communication d. Standard nautical vocabulary as described in the 'IMO Standard Marine Communication Phrases' publication e. Established written, verbal and non-verbal marine engineering communications practices f. Protocols and procedures for communicating with others on-board vessel g. Established engineering practice for the operation, checking, maintenance and repair of marine plant, machinery, equipment and systems h. Relevant OH&S and anti-pollution legislation, codes of practice, policies and procedures i. Marine engineering communication techniques, including barriers to effective communication and how to overcome them j. The various tools typically available for communication between the Bridge, Engine Control Room and Main Engine Room k. Relevant industrial award requirements as they relate to shipboard engineering personnel responsibilities, obligations and entitlements l. Knowledge and ability to read and interpret engineering specifications and drawings m. Knowledge and ability to read and interpret engineering information available through gauges, computer screens and various performance indicators n. Techniques for communicating effectively with a multilingual crew o. Typical communication problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to communicate effectively during engineering duties in a range of typical operational situations that may occur onboard a vessel of 3,000 kW propulsion or more, and/or b. communicate during engineering duties on an operational commercial or training vessel of unlimited propulsion power

Evidence Guide (continued)

USE ENGLISH IN WRITTEN AND ORAL FORM TO PERFORM ENGINEERING DUTIES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 obtaining, interpreting and applying information when performing engineering duties a.2 communicating with others, including passengers, on board vessel during normal engineering duties and emergency situations a.3 identifying and evaluating communication problems and determining appropriate courses of action a.4 identifying and implementing improvements to communication methods a.5 assessing the effectiveness of communications <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures, quality procedures and work instructions on the operation of shipboard plant, machinery and equipment b.4 job procedures and work instructions b.5 relevant vessel manufacturer's instructions and specifications relating to operation, checking, maintenance and repair of shipboard plant, machinery and equipment and directions on equipment capability and limitations b.6 environmental protection procedures <p>c. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	2	1	2	2

TDM MF3 01A **MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA**

Field F Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to monitor compliance with international and Australian legislative requirements and measures to ensure the safety of the life of crew, passengers and others at sea, including coordination of preventative and precautionary procedures, observing compliance, remedying non-compliance and maintaining relevant certification.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3.

ELEMENT	PERFORMANCE CRITERIA
1. Monitor vessel operations and maintenance procedures	<ul style="list-style-type: none"> a. Procedures for monitoring operations and maintenance according to regulatory and company requirements are followed b. Areas and plant equipment are checked and inspected regularly and according to company procedures c. Required measures to ensure safety of life of shipboard personnel at sea are monitored and implemented in accordance with international maritime conventions and Australian legislative requirements
2. Identify and rectify non-compliance with legislative requirements and measures	<ul style="list-style-type: none"> a. Problems that may lead to potential non-compliance are promptly and fully identified b. Remedial action is timely and ensures compliance with government requirements c. Training and instruction on procedures ensures shipboard personnel comply with regulations d. Advice to others on the legitimacy of operations is accurate and given at an appropriate time e. Failure to comply with procedures is identified and dealt with according to company procedures and relevant legislation
3. Maintain required certification of shipboard items and equipment	<ul style="list-style-type: none"> a. Documentation held by the vessel is proved to be complete against authorised inventory b. Certification extensions and requirements for renewals are timely and ensure continuous validity c. Survey items and equipment, with respect to certificate conditions, are in a state which reflects continuing effective programs of tests, checks and maintenance d. Arrangements for renewals and surveys are timely and comply with enterprise and issuing authority requirements e. Vessel's documents reflect adherence to procedures where the validity of certification may be affected by damage, alterations or additions to the vessel or operations f. Procedures are developed to ensure that only authorised personnel access documents
4. Maintain documentation related to legislative requirements	<ul style="list-style-type: none"> a. Certificates and documentation are stored in a manner which optimises their use and accessibility for the prosecution of vessel's business. b. Records are clear concise and accurate c. Records comply with regulatory and company requirements and format d. Any required corrections to records are made in such a manner as to maintain their validity e. Documentation is secure and confidentiality is maintained in accordance with specific procedures f. Computer backup procedures-follow good operating practices and company procedures g. Records and reports are distributed to the required authority at appropriate times and places

Range Of Variables

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant Australian and/or international regulations to ensure the safety of life at sea. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves significant judgement in monitoring compliance with legislative requirements and measures to ensure safety of life at sea across a wide and often unpredictable variety of operational contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Monitoring of compliance may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Legislative and regulatory requirements may include <ul style="list-style-type: none"> c.1. Australian and State/Territory OHS legislation c.2. Port State legislation and regulations related to the safety of life at sea c.3. International Safety Management (ISM) Code (where applicable) c.4. IMO SOLAS Convention d. Measures to maintain the safety of life at sea may include: <ul style="list-style-type: none"> d.1. training of officers and/or crew d.2. regular conduct of life saving and fire-fighting drills d.3. maintenance of life-saving and fire-fighting equipment and survival craft d.4. on-board hazard management identification and minimisation d.5. establishment and maintenance of effective watchkeeping arrangements d.6. maintenance of the seaworthiness of vessel and the serviceability of shipboard plant and equipment
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions (where relevant) a.2. operational orders a.3. relevant regulations, codes and conventions a.4. Australian and international OHS statutory regulations a.5. vessel's log a.6. company procedures a.7. insurance documentation a.8. vessel manufacturer's instructions and recommended procedures a.9. instructions of relevant Maritime Authorities a.10. relevant Australian and/or international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. international conventions and Australian regulations on the protection of life at sea a.5. relevant international, Australian and State/Territory OH&S, environmental and other legislation applicable to international and Australian vessels

Evidence Guide

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor vessel operations and maintenance procedures in terms of compliance with legislative requirements including measures to ensure safety of life at sea a.2. Identify and rectify non-compliance with legislative requirements and measures a.3. Maintain required certification of shipboard items and equipment a.4. Maintain documentation related to legislative requirements a.5. Identify typical legislative compliance problems and take appropriate action a.6. Communicate effectively with others on matters concerning legislative compliance
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the chief engineer and master of a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant regulations, codes and conventions related to the safety of life at sea b. Relevant OH&S legislation and policies c. International and Australian regulatory requirements and company policies, practices and procedures relating to: <ul style="list-style-type: none"> c.1. statutory certification c.2. survey c.3. records d. Regulations and associated measures to ensure safety of life of shipboard personnel at sea e. Problems in maintaining compliance with legislative requirements and measures to ensure safety of life at sea and appropriate action and solutions f. Sources of reference and information on detailed survey and certification requirements g. Systems and methods used for recording, retrieving and storing information, and their strengths and limitations h. Procedures for maintaining the security and confidentiality of information. i. Mandatory knowledge and skills in first aid, personal survival techniques, fire fighting and fire prevention required of all seafarers as required under the relevant maritime regulations
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to ensure compliance with legislative requirements and measures for the safety of life at sea, and/or a.2. where appropriate, assist in maintaining compliance with legislative requirements and measures to ensure safety of life at sea on board an operational vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 monitoring compliance with regulations and measures to ensure the safety of life at sea a.2 identifying and evaluating compliance problems and determining an appropriate courses of action a.3 identifying and implementing improvements to measures to ensure compliance with regulations a.4 assessing operational capability of vessel and manoeuvring plant and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 measures to ensure safety of life at sea b.6 following on-board housekeeping processes c. Action taken promptly to report and/or rectify non-compliance with relevant regulations on the safety of life at sea d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	3	2

TDM MF4 01A MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to maintain the operational condition of life-saving, fire fighting and other safety systems including the monitoring of the systems and their components to ensure that they function in the event of fire and other shipboard emergencies on board a commercial vessel.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW Code, AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3 and the relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Coordinate the monitoring of the operational condition of life saving, fire detection, fire fighting and other safety systems on board a vessel</p>	<p>a. Procedures for the routine maintenance of life saving, fire detection, fire fighting and other safety systems are established and their implementation coordinated in accordance with regulatory requirements and company procedures</p> <p>b. Routine procedures are followed to check the operational condition of life saving, fire detection, fire fighting and other safety equipment and systems</p> <p>c. Faulty or damaged equipment or components in life saving, fire detection, fire fighting and other safety systems are identified</p> <p>d. Faulty or damaged equipment or components are reported, repaired or replaced in accordance with company procedures and international regulations</p>
<p>2. Coordinate the checking and replacement of consumable materials and items in life saving, fire detection, fire fighting and other safety systems</p>	<p>a. Procedures for the checking and replacement of consumable materials and items in life saving, fire detection, fire fighting and other safety systems are established and their implementation coordinated</p> <p>b. Levels and/or quality of consumable materials and items used in life saving, fire detection, fire fighting and other safety systems are checked in accordance with company procedures and international regulations</p> <p>c. Consumable materials and items used in life saving, fire detection, fire fighting and other safety systems are replenished and replaced as required</p> <p>d. Life saving, fire detection, fire fighting and other safety systems are confirmed as operational following replenishment or replacement of consumable materials and items</p>
<p>3. Maintain documentation on the condition of life saving, fire detection, fire fighting and other safety systems on board a vessel</p>	<p>a. Information on the outcomes of routine monitoring and maintenance of the condition of life saving, fire detection, fire fighting and other safety equipment and systems is recorded as required by company procedures and international regulations</p> <p>b. Information on identified faulty equipment or components in life saving, fire detection, fire fighting and other safety systems and action taken to repair or replace them is documented in accordance with company procedures and international regulations</p> <p>c. Documentation on the checking and replenishment of consumable materials used in life saving, fire detection, fire fighting and other safety system is completed in accordance with company procedures and regulatory requirements</p>

Range Of Variables

MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations, conventions and codes. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the coordination of measures to check the condition of life-saving, fire-fighting and other safety equipment and to initiate repair or replacement where equipment is found to be defective or non-functional. Contribution to the development of a broad strategy for maintaining the operational condition of life-saving, fire-fighting and other safety equipment is involved. d. Work requires significant judgement in planning and coordinating the maintenance of life-saving, fire-fighting and other safety equipment on board vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Maintenance procedures may include: <ul style="list-style-type: none"> b.1. routine checks for operational serviceability of fire-detection, fire- fighting and safety equipment and systems b.2. identification of faults in and damage to fire-detection, fire- fighting, life-saving and safety equipment and initiation of repair or replacement action where required b.3. checking and replacement of consumable items such as extinguisher materials, detector or alarm batteries, etc. c. Fire detection and fire-fighting systems may include: <ul style="list-style-type: none"> c.1. fire detection devices and systems c.2. portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam c.3. CO₂ fixed systems c.4. foam installations including semi-portable and fixed systems c.5. sprinkler systems c.6. fire pumps – main and emergency fire pump c.7. fire hoses, hydrants, branches and international shore connection d. Life-saving and safety systems may include: <ul style="list-style-type: none"> d.1. life jackets d.2. survival craft d.3. life buoys d.4. emergency radio beacons d.5. life saving equipment and consumables e. Consumable materials and items that may used in life saving, fire detection, fire fighting and other safety systems may include: <ul style="list-style-type: none"> e.1. dry and wet chemicals used in fire extinguishers e.2. batteries for detectors, radios, beacons, etc. e.3. flares e.4. survival rations
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) a.2. IMO STCW 95 Convention and Code a.3. AMSA Marine Orders and Australian USL Code (as applicable) a.4. vessel's log a.5. fire-detection, fire- fighting and safety equipment operational and maintenance instructions and recommended procedures a.6. instructions of relevant Maritime Authorities related to the maintenance and serviceability of ship-board fire-detection, fire- fighting and safety equipment and systems a.7. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the IMO STCW 95 Code and Convention, Australian USL Code and AMSA Marine Orders a.2. regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.3. relevant Australian and State/Territory OH&S legislation

Evidence Guide

MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Check to fire-detection, fire- fighting, life-saving and safety equipment and systems a.2. Identify typical faults in to fire-detection, fire- fighting, life-saving and safety equipment and systems and initiate appropriate repair or replacement action where required a.3. Check and replace consumable materials in fire-detection, fire- fighting, life-saving and safety equipment and systems as required a.4. Communicate effectively with others as required during maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master or engineer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) as they relate to fire-detection, fire- fighting, life-saving and safety equipment and systems c. Types of fire-detection, fire- fighting, life-saving and safety equipment and systems used on board vessels and the procedures for their use d. Relevant regulations, codes of practice, policies and procedures related to the to the maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems e. Methods for checking and replacing consumable materials in typical ship-board fire-detection, fire- fighting and safety equipment and systems f. The importance of maintenance of ship-board fire-detection, fire- fighting, life-saving and safety equipment and systems and the potential consequences if the equipment or systems are not operational during an emergency g. Maritime communication techniques applicable to maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems h. Faults that can occur with shipboard fire-detection, fire- fighting and safety equipment and systems and appropriate remedial action and solutions i. Statutory and typical company requirements for the documentation of maintenance procedures and outcomes for fire-detection, fire- fighting, life-saving and safety equipment and systems used on board vessels
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to coordinate the maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems typically used on board vessels, and/or b. assist in the coordination of the maintenance procedures for fire-detection, fire- fighting, life-saving and safety equipment and systems on board an operational vessel

Evidence Guide (continued)

MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 coordinating the maintenance of on-board fire-detection, fire- fighting, life-saving and safety equipment and systems a.2 identifying and evaluating operational and maintenance problems with fire-detection, fire-fighting, life-saving and safety equipment and systems and determining appropriate courses of action a.3 identifying and implementing improvements to maintenance procedures for fire-detection, fire-fighting, life-saving and safety equipment and systems a.4 assessing operational capability of fire-detection, fire- fighting, life-saving and safety equipment and systems <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 Relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of fire-detection, fire- fighting, life-saving and safety equipment and systems, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes <p>c. Action taken promptly to report and/or rectify faulty fire-detection, fire- fighting, life-saving and safety equipment and systems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	2	1	2	3

TDM MF5 01A DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to contribute to the development emergency and damage control plans and handling of emergency situations on board a commercial vessel, including the preparation of contingency plans for response to emergencies, plans for damage control, procedures and aids for fire prevention, detection and extinction and the establishment and implementation of life-saving procedures including the use of various life-saving appliances.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW Code and Appendices 2 and 3 of Part 3, Issue 5 of the AMSA Marine Orders AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Prepare contingency plans for emergency response</p>	<ul style="list-style-type: none"> a. Potential emergency situations are identified in conjunction with relevant shipboard personnel b. Plans of action are developed by the master and chief engineer with appropriate assistance from other personnel detailing procedures for responding to potential emergency situations in accordance with regulatory requirements and company procedures c. Resources are organised in readiness for potential implementation of contingency plans d. Contingency plans for dealing with emergency response are documented in accordance with company procedures and regulatory requirements e. Shipboard officers and crew are made aware of contingency plans for emergency response f. Drills are carried out at appropriate times to test the readiness of shipboard personnel to implement emergency contingency plans
<p>2. Develop plans for damage control following a shipboard emergency</p>	<ul style="list-style-type: none"> a. Possible damage scenarios are identified and appropriate methods of damage control are devised by the vessel's management team in accordance with established marine practice b. Plans of action for dealing with shipboard damage, particularly that involving the integrity of the vessel's hull, are developed by the vessel's management team in accordance with regulatory requirements and company procedures c. Planned damage control procedures for dealing with damage to the vessel and its hull are documented in accordance with company procedures and regulatory requirements d. Appropriate resources are organised in readiness for possible deployment should there be damage to the vessel during an emergency
<p>3. Develop plans for fire protection, detection and extinction</p>	<ul style="list-style-type: none"> a. Plans of action for fire protection, detection and extinction are developed by the vessel's management team in accordance with regulatory requirements, marine fire control practice and company procedures b. Plans for fire protection, detection and extinction are documented in accordance with company procedures and regulatory requirements c. Appropriate resources are organised in readiness for possible deployment should there be a fire on board the vessel during an emergency d. Fire control drills are carried out at appropriate times to test the readiness of shipboard personnel to implement plans for fire protection, detection and extinction

<p>4. Develop procedures for the use of various life-saving appliances</p>	<ul style="list-style-type: none"> a. Procedures for the use of various shipboard life-saving appliances are developed by the vessel's management team in accordance with regulatory requirements, manufacturer's instructions and company procedures b. Procedures for the use of various life-saving appliances are documented in accordance with company procedures and regulatory requirements c. Instruction is organised for shipboard personnel in the correct use of life-saving appliances d. Life saving drills are carried out at appropriate times to test the readiness of shipboard personnel to correctly carry out life-saving procedures and use life-saving appliances
<p>5. Coordinate the implementation of emergency response plans</p>	<ul style="list-style-type: none"> a. Information on emergency response plans is distributed and made available to shipboard personnel via noticeboards, pamphlets and documented instructions b. Appropriate instruction is organised for shipboard personnel in their roles and responsibilities during various types of shipboard emergencies c. Appropriate emergency drills are carried out at appropriate times to test the readiness of shipboard personnel to correctly carry out various emergency response plans d. Appropriate alarms and directions are given when a shipboard emergency is detected e. Action in dealing with an emergency is coordinated in accordance with the emergency response plan, regulatory requirements and company procedures f. Details of a shipboard emergency and the action taken is documented in accordance with regulatory requirements and company procedures

Range Of Variables

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations, conventions and codes. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in planning for and coordinating shipboard emergencies. c. Work involves the application of a significant range of fundamental marine emergency principles, practices and procedures across a wide and often unpredictable variety of shipboard emergencies. Contribution to the development of shipboard emergency response plans is required. Accountability and responsibility for self and others in preparing for the possible implementation of emergency plans is involved. d. The Master has ultimate responsibility within the vessel's management team for the development and implementation of emergency control plans and responses. The Chief Engineer is responsible for the management, development and implementation of the machinery space emergency control plans. e. Work requires significant judgement in planning, technical and leadership functions related to the development and coordination of emergency procedures onboard vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Plans for emergency response may include: <ul style="list-style-type: none"> b.1. defining the roles and responsibilities of shipboard personnel during the emergency b.2. establishment of a chain of command b.3. details of the sequence of action to be taken during the type(s) of emergency concerned b.4. damage assessment procedures b.5. damage control measures b.6. resources deployment procedures including use of day-to-day items b.7. communications strategy b.8. life saving procedures b.9. abandon vessel procedures where required c. Potential emergencies may occur: <ul style="list-style-type: none"> c.1. by day or night c.2. under any possible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring d. Emergencies may include: <ul style="list-style-type: none"> d.1. collision with another vessel d.2. explosion on board a vessel d.3. fire on board a vessel d.4. impairment of integrity of hull d.5. loss of steering control d.6. loss of motive power d.7. grounding d.8. beaching a vessel d.9. person overboard d.10. rescue and evacuation of injured personnel e. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> e.1. use of softwood wedges and plugs to reduce water ingress e.2. erection and application of vertical shoring e.3. construction and fitting of a leak-stopping mat e.4. temporary repair of a ruptured pressurised pipe e.5. operation of a portable salvage pump f. Damage control measures in a fire or explosion emergency may include: <ul style="list-style-type: none"> f.1. use of appropriate fire fighting equipment and techniques such as various types of fire extinguishers, fire blankets, fire hoses and nozzles, and foam applicators f.2. activation of fixed fire fighting sprinklers and systems f.3. removal of fuel or heat source f.4. boundary cooling techniques

Range Of Variables (continued)

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> g. Survival equipment may include: <ul style="list-style-type: none"> g.1. life jackets g.2. exposure suits g.3. immersion suits g.4. survival craft
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO Conventions and Codes a.5. AMSA Marine Orders a.6. vessel's log a.7. company emergency procedures a.8. vessel manufacturer's instructions and recommended procedures for damage control measures a.9. instructions of relevant Maritime Authorities a.10. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the IMO Codes and Conventions and AMSA Marine Orders a.2. International Regulations for Preventing Collisions at Sea a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Prepare contingency plans for emergency response a.2. Develop plans for damage control following a shipboard emergency a.3. Develop plans for fire protection, detection and extinction on board a vessel a.4. Develop procedures for the use of various life-saving appliances a.5. Identify typical problems that may occur during a shipboard emergency and take appropriate action a.6. Communicate effectively with others during shipboard emergencies a.7. Document emergency response plans a.8. Prepare shipboard personnel to implement emergency response plans if required
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other relevant mandatory units that form part of a job role of a master or engineer officer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of the IMO Conventions and Codes and AMSA Marine Orders as they relate to damage control during shipboard emergencies b. ISM Code safety management system plans, procedures, checklists and instructions c. Relevant OH&S legislation, codes of practice, policies and procedures d. Requirements for emergency response contingency plans as per international regulations, AMSA Marine Orders and company policy e. Potential navigational emergencies for vessels and appropriate action and solutions f. General principles of damage control and the manner in which water-tight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair g. The concept of reserve buoyancy and its relevance to damage control on board vessels h. Statutory requirements pertaining to damage control in vessels i. Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvas and clothing j. Maritime communication techniques used during navigational emergencies k. Mandatory knowledge and skills in personal survival techniques, fire fighting and fire prevention required of all seafarers, as per Section A VI/1 of the IMO STCW 95 Code
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to develop emergency response plans and handle emergency situations on board vessels, and/or b. develop or improve emergency response plans on board an operational commercial vessel

Evidence Guide (continued)

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 developing emergency response plans and handling emergencies a.2 identifying and evaluating problems that may occur during a shipboard emergency and determining appropriate courses of action a.3 identifying and implementing improvements to emergency response plans a.4 applying safety and life-saving precautions and procedures during emergency situations on board a vessel a.5 preparing shipboard personnel to implement emergency response plans <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and Codes and AMSA Marine Orders b.2 ISM Code and associated ship's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 issue resolution procedures b.5 job procedures and work instructions b.6 relevant regulations relating to shipboard emergencies and damage control b.7 environmental protection during emergencies <p>c. Action taken promptly to report and/or rectify shipboard emergencies in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3	1	2	2

TDM MF7 01A OBSERVE SAFE WORKING PRACTICES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to implement regulatory requirements for occupational health and safety on board a commercial vessel, including following and applying established maritime safe working practices and procedures and hazard control strategies.

The unit is consistent with the related functional standard in Section A VI/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers. It covers the National Occupational Health and Safety Commission Generic Competency A and is equivalent to the Seafood Industry competency standard SFICORE104A Meet workplace health and safety requirements.

ELEMENT	PERFORMANCE CRITERIA
1. Identify and follow workplace procedures for hazard identification and risk control	<ul style="list-style-type: none"> a. Safety regulations and established vessel's safety and hazard control practices and procedures are obtained, interpreted and applied to day-to-day work activities b. Workplace procedures for Occupational Health and Safety and related work instructions for controlling risks onboard a vessel are accurately followed c. Workplace procedures for dealing with shipboard accidents, fire and emergencies are known and followed d. Hazards in the workplace are identified and appropriate action is taken to report them and to minimise or eliminate risk to personnel, vessel and the environment e. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed f. Personal protection clothing and equipment is correctly used in accordance with established shipboard safety practices and procedures g. Appropriate assistance is provided in the event of a shipboard emergency to secure the vessel and its machinery and equipment and to maintain the safety of the vessel and persons involved h. Established emergency and contingency plans are followed in the event of a shipboard emergency
2. Contribute to arrangements for the management of occupational health and safety	<ul style="list-style-type: none"> a. Occupational Health and Safety issues and identified safety hazards are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation b. Contributions to occupational health and safety management in the workplace are made within workplace procedures and provisions of relevant legislation c. Occupational health and safety issues are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation. d. Contribute to participative arrangements for occupational health and safety management in the workplace within vessel's procedures and scope of responsibilities and competencies
3. Complete Occupational Health and Safety records	<ul style="list-style-type: none"> a. Occupational health and safety records for self are completed in accordance with workplace requirements b. Legal requirements for the maintenance of records of occupational injury and diseases are followed

Range Of Variables

OBSERVE SAFE WORKING PRACTICE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime and OHS regulations. b. Safe working practices and procedures and established hazard control strategies are correctly applied to day-to-day work either individually or in a team environment with some accountability for the safety of self and others. c. Day-to-day work involves the application of known and established safe working and hazard control practices and procedures across a variety of normal and emergency contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Work may be conducted in enclosed spaces, exposed conditions and controlled or open environment c. Safe working practices and hazard control strategies must be applied at all times including: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring c.6. when slipped or in dry-dock c.7. when bunkering c.8. during cargo operations d. Emergencies may include: <ul style="list-style-type: none"> d.1. loss of propulsion d.2. loss of electrical power d.3. loss of steerage d.4. flooding of vessel d.5. fire or explosion d.6. loss of refrigeration d.7. loss of water making ability d.8. fuel oil, lubrication oil, steam and gas leaks d.9. overheating and overspeed of machinery, governors, emergency trips e. Workplace hazards may include: <ul style="list-style-type: none"> e.1. moving heavy loads in an unsafe work environment e.2. unsecure machinery, components or repair equipment e.3. slippery deck e.4. welding equipment e.5. sharp tools and implements e.6. power tools e.7. moving and rotating machinery e.8. flammable liquids, vapours and fuel e.9. faulty machinery equipment handling equipment and lifting gear e.10. using equipment beyond safe working limits e.11. poor housekeeping procedures e.12. non-compliance with safe working procedures e.13. electrical wiring and systems e.14. hot pipes and valves (steam, fuel oil, lubricating oil) e.15. cold pipes and valves (refrigeration and liquefied gas cargoes) e.16. working at heights e.17. exposed electrical circuits e.18. toxic gases and substances e.19. chemicals and other harmful substances e.20. damaged cargo and containers f. Personnel in work area may include vessel's officers and crew, passengers, contractors, official representatives g. Hazard identification may include activities associated with: <ul style="list-style-type: none"> g.1. checking equipment or the work area before work commences and during work g.2. workplace inspections g.3. housekeeping

Range Of Variables (continued)

OBSERVE SAFE WORKING PRACTICE

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>h. Participative arrangements may include:</p> <ul style="list-style-type: none"> h.1. formal and informal meetings which include occupational health and safety h.2. occupational health and safety committees h.3. other committees, for example, consultative, planning and purchasing h.4. health and safety representatives h.5. suggestions, requests, reports and concerns put forward by vessel's crew to senior officers <p>i. Designated personnel may include:</p> <ul style="list-style-type: none"> i.1. senior officers i.2. team leaders i.3. management occupational health and safety personnel i.4. other persons authorised or nominated by the company or senior officers to: <ul style="list-style-type: none"> i.4.1. perform specified work, i.4.2. approve specified work, i.4.3. inspect specified work, and i.4.4. direct specified work.
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions, (where applicable) a.2. vessel and company's safety management policies, emergency contingency plans and procedures a.3. records required under OHS legislation, for example: <ul style="list-style-type: none"> a.3.1. worker's compensation and rehabilitation records a.3.2. hazardous substances registers a.3.3. Material Safety Data Sheets a.3.4. major accident/injury notifications and a.3.5. certificates and licences a.4. manufacturers and suppliers OHS information a.5. OHS audits and inspection reports a.6. maintenance and testing reports a.7. workplace environmental monitoring and health surveillance records a.8. records of instruction and training and a.9. first aid / medical post records.
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of national and international maritime regulations dealing with OHS in shipboard workplaces a.2. relevant international, Australian and State/Territory OH&S legislation, particularly: <ul style="list-style-type: none"> a.2.1. OHS Acts, regulations and codes of practice, including regulations and codes of practice relating to hazards present in the workplace or industry; a.2.2. general duty of care under OHS legislation and common law; a.2.3. requirements for the maintenance and confidentiality of records of occupational injury and disease; a.2.4. requirements for provision of OHS information and training; a.2.5. provisions relating to roles and responsibilities of health and safety representatives and/or OHS committees a.2.6. provisions relating to OHS issue resolution.

Evidence Guide

OBSERVE SAFE WORKING PRACTICE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Identify and follow workplace procedures for hazard identification and risk control a.2. Contribute to arrangements for the management of OHS onboard a vessel a.3. Complete OHS records as required a.4. Communicate effectively with others on workplace safety matters
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime and OHS regulations b. ISM Code Safety Management System procedures (where applicable) c. The provisions of OHS Acts, regulations and codes of practice relevant to the workplace, including the rights and responsibilities of the workplace parties under OHS Acts, regulations and codes of practice; d. The ways in which OHS is managed in the workplace, and activities required under OHS legislation, for example: <ul style="list-style-type: none"> d.1. policies d.2. procedures d.3. plant and equipment maintenance d.4. hazard identification d.5. risk assessment and control d.6. OHS instruction d.7. training and provision of OHS information e. Hazards that exist in the workplace f. The preferred order of ways to control risks (known as the hierarchy of control); g. Workplace OHS procedures relevant to the work being undertaken, including procedures for: <ul style="list-style-type: none"> g.1. recognising and reporting on hazards, for example, work area inspections g.2. work operations to control risks, for example, permit to work systems and isolation procedures g.3. responding to accidents, fires and emergencies g.4. raising OHS issues g.5. employee participation in OHS management, for example, consultative or OHS committees and joint employer/employee inspections h. The meaning of OHS symbols found on signs and labels in the workplace i. Designated personnel responsible for OHS onboard a vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to contribute to the application of safe working practices and safety hazard control onboard a vessel; and/or b. Contribute to the application of safe working practices and hazard control and safety hazard control on a commercial or training vessel

Evidence Guide (continued)

OBSERVE SAFE WORKING PRACTICE

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. identifying and following workplace procedures for hazard identification and risk control a.2. contributing to arrangements for the management of OHS onboard a vessel a.3. completing OHS records as required a.4. communicating effectively with others on workplace safety matters b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. ISM Code and associated vessel's Safety Management System and procedures (where applicable) b.3. OHS regulations and hazard prevention policies and procedures b.4. on-board housekeeping processes b.5. waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify hazards, safety risks and safety incidents in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	1

TDM MF8 01A COMPLY WITH EMERGENCY PROCEDURES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to take appropriate initial action on becoming aware of an emergency on board a commercial vessel and to follow established emergency response procedures.

The unit is consistent with the related functional standard in Section A VI/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Take action on becoming aware of an emergency</p>	<p>a. Emergency situations are correctly recognised and identified</p> <p>b. Response to an emergency situation follows established vessel's emergency response procedures</p> <p>c. Correct action is taken on discovery of an actual or potential emergency in accordance with established vessel procedures</p> <p>d. Information given on raising alarm is prompt, accurate, complete and clear</p>
<p>2. Follow established emergency procedures</p>	<p>a. Vessel's contingency plans for emergency response are known and are implemented in real and simulated emergency situations</p> <p>b. Escape routes and internal and external communications and alarm systems are correctly used in real and simulated emergency situations in accordance with regulatory requirements and established procedures</p> <p>c. Emergency communications and alarm signals and systems are understood and required action implemented in accordance with emergency procedures and regulatory requirements</p> <p>d. Planned damage control procedures for dealing with damage to the vessel and its hull are implemented in accordance with company procedures and regulatory requirements</p>
<p>3. Follow procedures for the use of various life-saving appliances</p>	<p>a. Participation in life saving drills confirms readiness to correctly carry out life-saving procedures and use life-saving appliances</p> <p>b. Procedures for the use of various shipboard life-saving appliances are followed in accordance with regulatory requirements, manufacturer's instructions and company procedures</p>

Range Of Variables

COMPLY WITH EMERGENCY PROCEDURES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Responses to emergency situations follow a prescribed range of emergency procedures either individually or in a team environment with some accountability for the quality of outcomes. c. Responses involve the use of known and defined emergency systems and procedures across a variety of emergency contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Potential emergencies may occur: <ul style="list-style-type: none"> b.1. by day or night b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when bunkering b.7. during cargo handling operations c. Emergencies may include: <ul style="list-style-type: none"> c.1. collision with another vessel c.2. explosion on board vessel c.3. fire on board vessel c.4. impairment of integrity of hull and ingress of water c.5. loss of steering control c.6. loss of motive power c.7. foundering c.8. grounding c.9. beaching a vessel c.10. person overboard c.11. rescue and evacuation of injured personnel d. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> d.1. use of softwood wedges and plugs to reduce water ingress d.2. erection and application of vertical shoring d.3. construction and fitting of a leak-stopping mat d.4. temporary repair of a ruptured pressurised pipe d.5. operation of a portable salvage pump e. Damage control measures in a fire or explosion emergency may include: <ul style="list-style-type: none"> e.1. use of appropriate fire fighting equipment and techniques such as various types of fire extinguishers, fire blankets, fire hoses and nozzles, and foam applicators e.2. activation of fixed fire fighting sprinklers and systems e.3. removal of fuel or heat source e.4. boundary cooling techniques f. Survival equipment may include: <ul style="list-style-type: none"> f.1. life jackets f.2. exposure and immersion suits f.3. survival craft
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. SOLAS Convention a.3. vessel's emergency response procedures a.4. emergency procedures a.5. vessel manufacturer's instructions and recommended procedures for damage control measures a.6. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of the Australian USL Code a.3. relevant sections of AMSA Marine Orders a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

COMPLY WITH EMERGENCY PROCEDURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Take appropriate action in the event of discovering a shipboard emergency a.2. Follow vessel's contingency plans for emergency response a.3. Follow procedures for the use of various life-saving appliances a.4. Implement damage control following a shipboard emergency in accordance with instructions a.5. Identify typical problems that may occur during a shipboard emergency and take appropriate action a.6. Communicate effectively with others during shipboard emergencies a.7. Participate in drills to prepare shipboard personnel to implement emergency response
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Navigational emergencies for vessels and appropriate action and solutions d. Indications of various types of emergency situations and the action to be followed when various types of actual or potential emergency situations are identified e. Emergency alarm signals and systems in use on vessels and procedures to be followed when an emergency alarm is raised f. Escape routes and internal and external communications systems and alarms on board a vessel g. General principles of damage control and the manner in which watertight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair h. Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvas and clothing i. Maritime communication techniques used during navigational emergencies
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to respond to emergency situations onboard a commercial vessel, and/or b. follow emergency response plans and procedures during real and simulated emergency situations on board an operational commercial vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 taking initial action during real and simulated emergency situation a.2 implementing emergency during a real and simulated emergency situations a.3 identifying and evaluating problems that may occur during a shipboard emergency and determining appropriate courses of action a.4 applying safety and life-saving precautions and procedures during emergency situations on board vessel a.5 participating in drills aimed at preparing shipboard personnel to implement emergency response plans b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 relevant procedures and regulations relating to shipboard emergencies and damage control b.4 shipboard safety procedures b.5 environmental protection during emergencies c. Action taken promptly to report and/or rectify shipboard emergencies in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

COMPLY WITH EMERGENCY PROCEDURES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	1	1

TDM MF9 01A FIGHT AND EXTINGUISH FIRES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to fight and extinguish fires onboard a commercial vessel.

The unit is consistent with the related functional standard in Section A VII/1-2 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 4, and the Australian USL Code. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
1. Operate portable fire-fighting equipment	<ul style="list-style-type: none"> a. A, B and C classes of fires are correctly identified in accordance with accepted fire-fighting practice b. Correct portable fire-fighting equipment is selected and used to fight specific classes of fires c. Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice d. Correct techniques are applied for the use of hose lines to extinguish fires on board a vessel e. Where applicable, correct techniques are applied for the setting up of foam making equipment to extinguish B Class fires on board a vessel
2. Recharge portable fire extinguishers (where applicable)	<ul style="list-style-type: none"> a. Where applicable, correct techniques are used to recharge the various types of portable fire extinguisher b. Portable fire-fighting equipment is confirmed as operational following recharging
3. Carry out fire-fighting operations	<ul style="list-style-type: none"> a. Correct procedures and techniques are followed when fighting fires in simulated or real fire emergencies b. Safety clothing, appliances and equipment are appropriate to the nature of the fire-fighting operations c. Extinguishment of a fire is achieved using appropriate procedures, techniques, equipment and fire-fighting agents d. Correct portable fire-extinguisher(s) are selected and used for the class of fire involved in a fire emergency e. Appropriate safety precautions and procedures are applied when fighting fires in accordance with regulatory requirements, vessel's procedures and established fire-fighting practice f. The timing and sequence of individual actions when fighting fires onboard a vessel are appropriate to the prevailing circumstances and conditions g. Procedures for donning and starting up self-contained breathing apparatus (SCBA) are correctly applied h. Procedures for the logging of SCBA operators on a BA Control Board is correctly followed in accordance with vessel's procedures and accepted fire-fighting practice i. Search and rescue operations in a smoke filled environment are correctly conducted as a member of a fire-fighting team in accordance with accepted fire-fighting practice j. Interior fires are extinguished using appropriate fire fighting equipment and procedures as a member of a fire-fighting team in accordance with accepted fire-fighting practice k. Lifeline signals are correctly used during interior fire-fighting operations l. A compartment filled with high expansion foam is correctly entered as per accepted fire-fighting practice

Range Of Variables

FIGHT AND EXTINGUISH FIRES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed as a member of a team within defined fire-fighting situations, with some responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of prescribed principles and practice to the prevention and fighting of fires on board a vessel. Participation as a member of a fire-fighting team is involved. d. Work requires some judgement and teamwork in the execution of prescribed procedures for the fighting of fires that may occur onboard a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Fires on board a vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of fires which may occur on board a vessel include Classes A, B, C and F in the standard classification of fires d. Fire-fighting equipment, appliances and systems may include: <ul style="list-style-type: none"> d.1. portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam d.2. fire blankets d.3. CO₂ fixed systems d.4. foam installations including semi-portable and fixed systems d.5. sprinkler systems d.6. fire pumps (main and emergency fire pump) d.7. fire hoses, hydrants, branches and international shore connection e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. fire-resistant clothing e.2. self-contained breathing apparatus (SCBA) e.3. masks e.4. eye and ear protection e.5. gloves e.6. boots f. Consumable materials and items that may used in fire detection and fire fighting equipment may include: <ul style="list-style-type: none"> f.1. Dry and wet chemicals used in fire extinguishers f.2. Batteries for fire detectors
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Relevant maritime regulations a.2. fire-fighting and safety equipment operational and maintenance instructions and recommended procedures a.3. instructions of relevant Maritime Authorities related to the maintenance and serviceability of ship-board fire- fighting and safety equipment and systems a.4.
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. the Australian USL Code a.4. international regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

FIGHT AND EXTINGUISH FIRES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Participate in simulated on-board fire-fighting activities a.2. Participate in search and rescue and fire-fighting teams a.3. Implement OHS principles and policies when carrying out fire-fighting duties a.4. Communicate effectively with others as required during fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. ISM Code and associated ship's Safety Management System and procedures, where relevant c. The chemistry of fire and its relationship to materials typically carried on vessels d. Principles underlying the spread of fire and its extinguishment e. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment f. Principles and procedures for the use of self-contained breathing apparatus (SCBA) when fighting fires g. Fire-fighting clothing, outfits and personal safety equipment used when fighting a fire onboard a vessel h. Types fire-fighting appliances, equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance i. Fixed fire prevention and extinguishing installations used on vessels and their principles of operation j. Fire-fighting techniques, agents and precautions applicable to different classes of fire on board a vessel k. Maritime communication techniques applicable to fire-fighting activities onboard a vessel l. Typical problems that can occur with shipboard fire-fighting equipment and operations and appropriate remedial action and solutions m. Sources of information on shipboard fire prevention and extinguishment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire fighting activities on board a vessel, and/or b. assist in fire-fighting drills on board an operational vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards. Simulated conditions should provide truly realistic simulated shipboard conditions including, where practical, conduct of activities in darkness.</p>

Evidence Guide (continued)

FIGHT AND EXTINGUISH FIRES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 implementing the implementation of fire prevention measures and procedures a.2 identifying and evaluating fire fighting problems and determining appropriate courses of action a.3 participating as a member of an interior search and rescue and fire-fighting team on board a vessel a.4 assessing the operational capability of fire-fighting appliances, equipment and systems and taking any required maintenance or replenishment action <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code Safety Management System procedures, where applicable b.3 OHS regulations and hazard prevention policies and procedures b.4 relevant manufacturer's guidelines relating to the use of fire-detection and fire-fighting equipment and systems, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes and fire-hazard prevention measures b.6 fire prevention procedures and policies <p>c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection and fire-fighting, equipment and systems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	3	1	1	2

TDM MF10 01A PROVIDE FIRST AID

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to provide basic first aid on board a vessel, including the performance of immediate life saving first aid until qualified medical assistance is available; the recognition of the symptoms and signs of acute illness and / or injury and the taking of appropriate action; the correct management of wounds and bleeding, burns, and bone and muscle injuries; and the adaptation of First Aid procedures for remote situations. (The unit is consistent with competency requirements set for the 'St John Ambulance National Senior Level First Aid Certificate' or 'Level 2 First Aid Certificate'.)

(Note that this unit may be replaced with the generic First Aid Unit currently being developed by the Health and Community Services Industry Training Advisory Board when endorsed)

The unit is consistent with the basic first aid requirements specified in the AMSA Marine orders and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
Perform immediate life saving first aid pending the arrival of medical assistance	<ul style="list-style-type: none"> a. The priorities of First Aid Care are correctly applied in a real or simulated first aid situation b. The DRABC Action plan is correctly used to identify and control danger, loss of consciousness, loss of airway, breathing and circulation c. An unconscious casualty is correctly placed in stable side position and the steps in clearing the airways to promote breathing in accordance with established first aid procedures d. The correct method of Expired Air Resuscitation (EAR), External Cardiac Compression (ECC) and Cardio Pulmonary Resuscitation (CPR) is applied in a real life resuscitation situation, or in a simulated exercise using a manikin
Recognise the symptoms and signs of acute illness and / or injury and take appropriate action	<ul style="list-style-type: none"> a. The symptoms and signs of the most common causes of unconsciousness are correctly identified b. A real or simulated unconscious casualty is cared for in accordance with established first aid procedures c. Causes of respiratory failure and breathing difficulty are correctly identified and appropriate care is provided for a real or simulated casualty with obstructed breathing d. The symptoms and signs of a casualty with angina pain, heart attack and heart failure are correctly identified e. Symptoms and signs of acute abdominal and pelvic injury are correctly identified and appropriate immediate first aid treatment of these conditions is provided in a real or simulated situation f. Facial, ear and eye injuries in a real or simulated first aid situation are correctly managed in accordance with established first aid procedures g. The symptoms and signs of poisoning, bites and stings are correctly identified and appropriate immediate management of these conditions is provided in a real or simulated situation h. A real or simulated conscious casualty with an acute illness and/or injury is cared for in accordance with established first aid procedures

Manage wounds and bleeding	<ul style="list-style-type: none"> a. Severe external bleeding is correctly controlled in a real or simulated situation b. The symptoms and signs of severe internal bleeding are correctly identified and appropriate immediate management of these conditions is provided in a real or simulated situation c. The symptoms and signs of shock as a result of severe injury are correctly identified and appropriate immediate management of shock is provided in a real or simulated situation d. A real or simulated laceration, abrasion and a deep puncture wound is correctly managed in accordance with established procedures e. The signs of wound infection are correctly identified and a real or simulated wound infection is correctly managed in accordance with established procedures
Manage burns	<ul style="list-style-type: none"> a. Immediate rescue procedures are correctly used in real or simulated first aid situations involving a burned casualty b. The severity of a burn is correctly assessed in terms of depth, position and size in accordance with established first aid procedures c. The correct method of treatment for burns and associated shock is correctly applied in real or simulated first aid situations involving a burned casualty
Manage bone, joint and muscle injuries	<ul style="list-style-type: none"> a. Symptoms and signs of fractures (simple and complicated), are correctly recognised in accordance with established first aid procedures b. Problems and treatment associated with dislocated joints are correctly managed in accordance with established first aid procedures c. First aid treatment of pelvic and chest injuries and fractures of limbs, including immobilisation techniques is correctly performed in accordance with established procedures d. A real or simulated casualty with suspected head, neck and back injuries is correctly cared for in accordance with established first aid procedures e. The symptoms and signs of sprains and strains are correctly identified in accordance with established first aid procedures f. The R.I.C.E. method of treatment of sprains and strains is correctly used in real or simulated first aid situations involving sprains and strains
Adapt First Aid procedures for remote situations	<ul style="list-style-type: none"> a. Safety precautions needed to prevent accidents, illness and injuries and infection in remote area situations are correctly applied in real or simulated situations b. Identify and discuss the factors involved in the prevention of heat and cold exposure. c. The symptoms and signs of a real or simulated casualty exposed to heat or cold are correctly identified including hyperthermia and hypothermia and appropriate management of the casualty carried out in accordance with established first aid procedures d. A real or simulated ill or injured person in remote conditions is correctly cared for until help arrives, including the monitoring of airway, breathing and heart beat, the control of pain, hydration and the maintenance of body temperature. e. A real or simulated casualty with 'severe injuries' in a remote situation is correctly cared for, including the preparation for transport f. First aid and emergency equipment required for remote area situations is correctly identified and used in real or simulated situations in accordance with established first aid procedures

Range Of Variables

PROVIDE FIRST AID

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations and established first aid procedures b. First aid is administered in accordance with established procedures pending the arrival of qualified medical assistance, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of a knowledge of the basic techniques required to provide first aid to crew and/or passengers during a real or simulated first aid situation on board a vessel. c. Work requires appropriate skill in recognising and confirming the nature and extent of injury or illness and the provision of first aid within the limits of responsibility of the person concerned. First aid may need to be provided in remote situations.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. First aid procedures may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and sea b.3. while underway b.4. when at anchor b.5. when moored c. First aid on board a vessel may need to be provided in situations involving: <ul style="list-style-type: none"> c.1. acute illness and/or injury c.2. laceration, abrasion and a deep puncture wounds c.3. respiratory failure and breathing difficulty c.4. shock as a result of severe injury c.5. abdominal, pelvic and chest injuries c.6. fractures of limbs c.7. poisoning, bites and stings c.8. sprains, strains and dislocations c.9. facial, ear and eye injuries c.10. suspected head, neck and back injuries d. Conditions requiring special first aid procedures may include: <ul style="list-style-type: none"> d.1. explosion injuries d.2. burns d.3. poisons and envenomation d.4. hypothermia and hyperthermia e. First aid resources may include: <ul style="list-style-type: none"> e.1. vessel's medicine cabinet e.2. first aid boxes e.3. emergency first aid carry bags e.4. specific first aid resources such as: <ul style="list-style-type: none"> e.4.1. roller bandages e.4.2. triangular bandages e.4.3. splints (improvisable) e.4.4. face shields e.4.5. face masks e.4.6. cleaning swabs e.4.7. cleaning brush e.4.8. cleaning solution e.4.9. non adhesive dressings
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Relevant sections of maritime regulations dealing with the administration of first aid on board a vessel a.2. <i>'Australian First Aid'</i>, The Authorised Manual of St John Ambulance Australia, (Melbourne) Australia .Latest Edition (or equivalent) a.3. company and vessel safety and first aid policy and procedures a.4. instructions of relevant maritime and health authorities related to the administration of first aid of crew and passengers on board a vessel

Range Of Variables (continued)

PROVIDE FIRST AID

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include: a.1. relevant sections of IMO STCW 95 Code and Convention concerning first aid requirements a.2. relevant sections of AMSA Marine Orders concerning first aid requirements a.3. relevant sections of the Australian USL Code concerning first aid requirements a.4. relevant regulations of State/Territory marine authorities dealing with first aid a.5. Australian and State/Territory OHS legislation

Evidence Guide

PROVIDE FIRST AID

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none">a. Assessment must confirm appropriate knowledge and skills to:<ul style="list-style-type: none">a.1. Perform immediate life saving first aida.2. Recognise the symptoms and signs of acute illness and / or injury and take appropriate actiona.3. Manage wounds and bleedinga.4. Manage burnsa.5. Manage bone, joint and muscle injuriesa.6. Adapt First Aid procedures for remote situationsa.7. Communicate effectively with others during provision of first aida.8. Report on first aid situations and activities in accordance with company and regulatory requirements
2. Interdependent assessment of units	<ul style="list-style-type: none">a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel).
3. Required knowledge and skills	<ul style="list-style-type: none">a. Sections of relevant maritime regulations dealing with first aid at seab. ISM Safety Management System procedures (where applicable) dealing with first aidc. First aid situations that may occur on board a vessel and appropriate first aid action, treatments and solutionsd. Relevant OH&S and health legislation and procedurese. The priorities of First Aid Caref. First aid duties and responsibilities of personnel on board a vesselg. Established first aid procedures consistent with 'St John Ambulance National Senior Level First Aid Certificate' or 'Level 2 First Aid Certificate'h. Shipboard first aid procedures for:<ul style="list-style-type: none">h.1. conducting an initial patient first aid assessmenth.2. managing injuriesh.3. carrying out resuscitation techniquesh.4. reporting on first aid situations and action takeni. Techniques for management and care of casualties in various first aid situations including:<ul style="list-style-type: none">i.1. acute illness and / or injuryi.2. wounds and bleedingi.3. burnsi.4. bone, joint and muscle injuriesj. Causes of respiratory failure and breathing difficultyk. The DRABC action plan for the identification and control of danger, loss of consciousness, loss of airway, breathing and circulationl. Correct methods of Expired Air Resuscitation (EAR), External Cardiac Compression (ECC) and Cardio Pulmonary Resuscitation (CPR)m. The symptoms and signs of:<ul style="list-style-type: none">m.1. the most common causes of unconsciousnessm.2. poisoning, bites and stingsm.3. sprains and strainsm.4. fractures (simple and complicated)m.5. dislocated jointsm.6. head, neck and back injuriesm.7. severe internal bleedingm.8. abdominal, pelvic and chest injuriesm.9. shock as a result of severe injurym.10. angina pain, heart attack and heart failurem.11. burns and associated shockn. The safety precautions needed to prevent accidents, illness and injuries and infection in remote area situationso. Knowledge of body structures and functions relevant to possible injury and illnesses that may be encountered on board a vesselp. Communication techniques related to the provision of first aidq. Marine publications containing information on first aid treatment on board a vessel

Evidence Guide (continued)

PROVIDE FIRST AID

<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to provide first aid to injured or ill crew and passengers, and/or b. assist in the real or simulated first aid procedures on board an operational vessel <p><i>Note:</i> Simulated first aid situations and assessments may require access to resuscitation manikins, auxiliary resuscitation items, disposable gloves, slings, water squeeze bottle or tap, roller bandages, triangular bandages, splints (improvisable), face shields, face masks, cleaning swabs, cleaning brush, cleaning solution, disposable lungs and airways, samples of non adhesive dressings, pictures of venomous animals/insects or preserved specimens, and blankets pillows and towels</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. performing immediate life saving first aid a.2. recognising the symptoms and signs of acute illness and / or injury and taking appropriate action a.3. managing wounds and bleeding a.4. managing burns a.5. managing bone, joint and muscle injuries a.6. adapting first aid procedures for remote situations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of maritime regulations dealing with first aid b.2. OHS regulations and first aid instructions and procedures b.3. vessel safety procedures c. Action taken promptly to report and/or manage injuries and first aid in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MF11 01A SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to survive at sea in the event of abandonment.

The unit is consistent with the relevant maritime regulations describing mandatory minimum requirements for familiarization and basic safety competence required for all seafarers. This includes relevant sections of the Australian USL Code, Section A VII/1-1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Practice survival techniques</p>	<ul style="list-style-type: none"> a. The timing and sequence of individual survival actions are appropriate to the prevailing circumstances and conditions of the emergency and minimize potential dangers and threats to other survivors b. Initial actions when boarding survival craft enhance chance of survival c. Jumps safely from a height into the water in accordance with established survival practice d. Swims while wearing a lifejacket and floats without a lifejacket in accordance with established survival practice e. Inverted liferaft is righted while wearing a lifejacket in accordance with established survival practice f. Appropriate handling strategies are applied to manoeuvre survival craft in rough weather and sea conditions g. Sea anchors and drogues are deployed in accordance with accepted nautical practice h. Signs of hypothermia or other distress are identified and treated in accordance with accepted survival medical practice i. Exposure cover is deployed on an open lifeboat in accordance with accepted survival practice and manufacturer's instructions j. Rationing of food is in accordance with accepted survival practice
<p>2. Operate life saving and survival equipment</p>	<ul style="list-style-type: none"> a. Location and accessibility of life-saving and survival equipment is established b. Method of boarding survival craft is appropriate and avoids dangers to other survivors c. Survival equipment is operated in accordance with instructions and accepted survival practice d. Survival radio equipment is operated in accordance with manufacturer's instructions and regulatory protocols e. Immersion suit, various thermal protective aids, life-jacket and other life-saving clothing are correctly donned and used in accordance with instructions f.
<p>3. Participate in abandon vessel drills</p>	<ul style="list-style-type: none"> a. Abandon vessel musters and drills are attended in accordance with regulatory requirements and company procedures b. Action taken on identifying muster signals is appropriate to the indicated emergency and complies with established procedures c. Information is obtained and correctly interpreted on the use of life-saving equipment and procedures to be followed in the event of the order to abandon vessel

Range Of Variables

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Responses to abandon vessel alarms follow a prescribed range of survival procedures either individually or in a team environment with some accountability for the safety of self and others. This includes response to abandon vessel musters in both simulated and real emergency circumstances. c. Responses involve the use of known and defined survival procedures and techniques across a variety of maritime survival contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Emergencies that may lead to abandonment of vessel include: <ul style="list-style-type: none"> b.1. collision resulting in damage to the integrity of the vessel's hull b.2. fire b.3. foundering b.4. flooding of vessel's compartments c. Vessel abandonment may take place: <ul style="list-style-type: none"> c.1. by day or night c.2. under normal and adverse conditions of sea and weather c.3. while underway c.4. while hove to c.5. while anchored or moored c.6. in appropriately simulated situations d. Survival craft may include: <ul style="list-style-type: none"> d.1. free-fall life boats d.2. davit-launched life-boats d.3. life rafts d.4. rescue boats e. Life-saving and survival equipment may include: <ul style="list-style-type: none"> e.1. life jackets e.2. life buoys e.3. hard hats e.4. immersion suits and other thermal protective aids e.5. rocket line throwing appliances e.6. pyrotechnic distress signals e.7. GMDSS survival craft VHF radios e.8. satellite emergency position indicating radio beacons (EPIRBs) e.9. search and rescue transponders (SARTs) e.10. whistles f. Consumable materials and items that may used in life saving equipment may include: <ul style="list-style-type: none"> f.1. batteries for detectors, radios, beacons, etc. f.2. flares f.3. survival rations g. In-water survival techniques may include: <ul style="list-style-type: none"> g.1. swimming in a life-jacket g.2. towing with a life jacket g.3. remaining afloat without a life jacket g.4. donning a life jacket in water g.5. the group huddle g.6. heat escape lessening posture h. Threats to survival after abandoning vessel may include: <ul style="list-style-type: none"> h.1. cold water shock h.2. hypothermia h.3. psychological response to disaster h.4. loss of will to live h.5. sea sickness h.6. dehydration h.7. injuries h.8. starvation

Range Of Variables (continued)

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. Relevant maritime regulations a.2. SOLAS regulations a.3. AMSA publication 'Survival at Sea – a Training and Instruction Manual' a.4. instructions from official search and rescue authorities a.5. vessel's procedures for emergency response including abandoning vessel a.6. manufacturer's instructions for the use of survival craft and equipment a.7. instructions of relevant Maritime Authorities related to survival at sea a.8. relevant OH&S legislation, codes of practice, policies and procedures a.9. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. Relevant maritime regulations including: <ul style="list-style-type: none"> a.1.1. relevant sections of Australian Uniform Shipping Laws (USL) Code a.1.2. IMO STCW 95 Code and Convention dealing with survival at sea and use of survival craft and equipment a.1.3. relevant sections of AMSA Marine Orders dealing with survival at sea and use of survival craft and equipment a.2. Safety of Life at Sea (SOLAS) regulations a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Practice survival techniques in suitably simulated situations a.2. Operate and use the various types of survival equipment typically found on a vessel in suitably simulated situations a.3. Participate in abandon vessel musters and drills a.4. Communicate effectively with others as required when operating survival craft and ancillary survival equipment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations dealing with survival at sea following abandonment of vessel b. Relevant OH&S legislation and policies c. SOLAS regulations d. Incidents that may result in an emergency on board vessel and the appropriate response in each case e. Emergency muster and abandon vessel signals f. Importance of being ready for any shipboard emergency g. Procedures for emergency response on board vessels including abandoning vessel h. Initial actions for survival on abandonment of vessel as summarised in maritime survival publications such as the AMSA publication 'Survival at Sea – a Training and Instruction Manual' i. Value of training and emergency drills for enhancing chances of survival at sea j. Location of personal lifesaving appliances on a vessel k. Construction, outfit and particular characteristics of various types of life boats, life rafts and rescue boats l. Equipment found in survival craft, the function and the procedures for their use m. Procedures for correctly operating and using lifesaving appliances and personal safety equipment on board vessels and survival craft and specifically <ul style="list-style-type: none"> m.1. donning a life jacket and using a life jacket light and whistle m.2. donning an immersion suit m.3. deployment of a mob combination light and smoke float m.4. use of hand-held pyrotechnics n. Threats to survival on abandonment of a vessel and appropriate strategies for countering these threats o. Ways of maximising detectability and location of survival craft using pyrotechnic distress signals, portable VHF radios, satellite EPIRBs and SARTs p. IMO safety symbols q. Procedures for the rationing of food and water in survival craft r. Personal protective clothing and equipment -- their purpose and use s. Symptoms of hypothermia, its prevention and treatment and the related use of protective covers and garments such as immersion suits and thermal protective aids t. Maritime communication techniques

Evidence Guide (continued)

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to abandon vessel and survive at sea, and/or b. participate in vessel musters and drills in appropriately simulations of maritime conditions c. participate in abandon vessel simulations and drills on board an operational commercial or training vessel <p><i>Note:</i> Simulated abandon vessel and survival situations and assessments may require access to open and enclosed life boat fittings and equipment, on-load release gear training aid, open life boat and davit, life boat and rescue boat equipment, life jackets and hard hats, davit launched life raft and davit, inflatable throw over life raft, cradle and hydrostatic release, life boat/life raft boarding ladders, foul weather gear, training pool with jumping platform or equivalent, immersion suits, a selection of shipboard life saving, alerting and detection equipment typically found on vessels</p> <p>Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian standards. At least one assessor must hold a current life saving qualification appropriate for in-water training and assessment exercises</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 participating in simulated emergency response musters and drills a.2 operating survival equipment a.3 applying safety precautions relevant to survival operations a.4 assessing operational capability of survival craft and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 accepted survival procedures and maritime survival practice b.4 relevant manufacturer's guidelines relating to the operation and use of survival equipment, including instructions on equipment capability and limitations c. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDM MF12 01A MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire.

The unit is consistent with the related functional standard in Section A VI/1-2 of the STCW95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 4, and relevant sections of the Australian USL Code. It forms part of mandatory minimum requirements for familiarisation and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Carry out fire minimisation procedures</p>	<ul style="list-style-type: none"> a. Fire hazards on board vessel are identified and action is taken to eliminate or minimise them b. Responsibilities for checking fire prevention equipment and systems are fulfilled and appropriate action is taken to ensure that they are operational c. An awareness and understanding of the causes of fire and its minimisation is maintained through participation in fire drills and related instructional programs d. A state of readiness to respond to fire emergencies is maintained at all times
<p>2. Respond to emergency situations involving fire</p>	<ul style="list-style-type: none"> a. Emergency situations involving fire are correctly identified in accordance with established nautical practice b. Type of fire is identified in accordance with the established classification system for fires c. Initial action on becoming aware of fire emergency is in conformity with established practices and procedures d. Action taken is timely and appropriate for seriousness of the fire emergency e. Action taken on identifying muster signals for a fire emergency is appropriate and complies with established procedures f. Appropriate precautions and procedures are implemented when responding to electrical fires g. Appropriate precautions and procedures are implemented when responding to uptake and hydrogen fires h. Communications are clear and concise at all times and orders are acknowledged in a timely and seamanlike manner

Range Of Variables

MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work involves the application of prescribed principles and practice to the minimisation of the risk of fire onboard vessel. Maintenance of a state of readiness to respond to fire emergencies is involved. It requires some judgement and teamwork in the execution of prescribed procedures for the minimisation of the risk of fire and responding to fire emergencies onboard a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Fire emergencies on board vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of fires which may occur on board vessel include Classes A, B, C and F in the standard classification of fires d. Fire hazard minimisation procedures may include: <ul style="list-style-type: none"> d.1. housekeeping in work areas d.2. following of fire safety procedures d.3. checking and maintaining shipboard fire prevention systems d.4. identification and elimination or minimisation of fire hazards d.5. precautions when using and storing flammable materials d.6. precautions that need to be taken when responding to an electrical fire d.7. precautions that need to be taken when responding to uptake and hydrogen fires d.8. precautions when using naked flames or welding equipment
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant regulations concerning minimisation of the risk of fire on board vessel a.2. vessel's instructions and procedures concerning minimisation of the risk of fire a.3. publications on marine fire prevention and minimisation and emergency response a.4. fire-detection, fire-fighting and safety equipment operational and maintenance instructions and recommended procedures a.5. instructions of relevant Maritime Authorities related to the maintenance and serviceability of ship-board fire-detection, fire-fighting and safety equipment and systems a.6. relevant Australian and international standards
4. Workplace context	<p>Workplace organisation may be defined by:</p> <ul style="list-style-type: none"> a. Company work organisation procedures and practices b. Conditions of service, industrial legislation and agreements including: <ul style="list-style-type: none"> b.1. workplace agreements and awards b.2. Australian and State/Territory industrial legislation
5. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the IMO STCW Convention and Code, Australian USL Code and AMSA Marine Orders concerning minimisation of the risk of fire on board vessel a.2. regulations for the maintenance of fire-detection, fire-fighting and safety equipment and systems a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement fire prevention and minimisation measures and procedures on board vessel a.2. Recognise fire hazards onboard vessel and take appropriate action to eliminate or minimise them a.3. Assess the operational capability of fire-detection and fire-fighting equipment and systems and initiate any required maintenance or replenishment action a.4. Respond to emergency situations involving fire a.5. Implement OHS principles and policies when carrying out fire prevention and fire-fighting duties a.6. Communicate effectively with others as required during fire prevention activities and fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations concerning minimisation of the risk of fire on board vessel b. The chemistry of fire and its relationship to materials typically carried on vessels c. Principles underlying the spread of fire and its extinguishment, including <ul style="list-style-type: none"> c.1. the elements of fire and explosion (the fire triangle) c.2. types and sources of ignition c.3. flammable materials and fire hazards c.4. factors that influence the spread of fire d. The importance of constant vigilance in fire prevention and minimisation e. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment f. A basic understanding of the types of fire-detection, fire-fighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance g. Relevant regulations and policies related to the maintenance of fire equipment and systems h. Precautions and procedures that must be followed when responding to electrical fires i. Precautions and procedures that must be followed when responding to uptake and hydrogen fires j. Maritime communication techniques applicable to fire prevention and fire-minimisation activities on board vessel k. Problems that can occur with shipboard fire-detection and fire hazards on board a vessel and appropriate action that should be taken l. Sources of information on shipboard fire prevention and minimisation
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire prevention and minimisation strategies on board vessels, and/or b. assist in fire prevention and minimisation procedures and fire drills on board an operational trading or training vessel <p><i>Note:</i> Simulated fire prevention assessment exercises may require access to a fire training and assessment facility capable of simulating fire and fire-prevention activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards.</p>

Evidence Guide (continued)

MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 implementing of fire prevention and minimisation measures and procedures a.2 identifying and evaluating fire hazards and taking appropriate courses of action a.3 responding to simulated and real emergency situations involving fire a.4 assessing the operational capability of fire-detection equipment and systems and taking any required maintenance or replenishment action <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations concerning minimisation of the risk of fire on board vessel b.2 OHS regulations and hazard prevention policies and procedures b.3 relevant manufacturer's guidelines relating to the use of fire-detection equipment and systems, including instructions on equipment capability and limitations b.4 on-board housekeeping processes and implementing fire-hazard prevention measures b.5 fire minimisation procedures and policies <p>c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection equipment and systems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2

TDM MF13 01A MANAGE MARINE FIRE-FIGHTING AND PREVENTION ACTIVITIES

Field MF Operational quality and safety

DESCRIPTION:

This unit involves the skills and knowledge required to carry out advanced fire fighting and to manage fire fighting and fire prevention activities on board a commercial vessel, including managing shipboard fire fighting teams, developing and implementing on-board fire fighting training exercises, coordinating shipboard tactical fire fighting activities, managing the evacuation of personnel from fire and smoke affected compartments, managing fire prevention and suppression activities involving hazardous goods, managing the maintenance of fire fighting equipment, supervising the operation of fixed fire suppression systems, liaising with shore-based agencies, and managing fire investigation and reporting activities.

The unit is consistent with the related functional standard in Section A VII/3 of the STCW 95 Code, AMSA Marine Orders – Part 3, Issue 5, Appendix 5 and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Manage shipboard fire fighting teams	<ul style="list-style-type: none"> a. The roles/functions of the command and other teams in a shipboard fire situation is established in accordance with regulatory requirements, established marine fire fighting practice and company requirements b. A check list for use in fire fighting management is developed and implemented in accordance with regulatory requirements and established marine fire fighting practice. c. Information on a shipboard fire situation is obtained and analysed by the command team in accordance with regulatory requirements and established marine fire fighting practice. d. Problems in shipboard fire are identified and appropriate strategies for dealing with tactical fire fighting problems are developed in accordance with regulatory requirements and established marine fire fighting practice. e. A check list for use in fire fighting management is developed and implemented in accordance with regulatory requirements and established marine fire fighting practice.
2. Coordinate shipboard tactical fire fighting activities	<ul style="list-style-type: none"> a. Hazards associated with a shipboard fire are identified and appropriate hazard control strategies developed and implemented in accordance with the vessel's safety management system, regulatory requirements and established marine fire fighting practice b. Controlled ventilation techniques are correctly applied in fire suppression and rescue applications in accordance with established marine fire fighting practice c. Tactical plan of action in a shipboard fire situation is determined in accordance with the fire control plan and established marine fire fighting practice d. Free surface effects that may occur during fire fighting operations are identified and appropriate solutions developed to maintain vessel stability in accordance with established marine fire fighting practice. e. Communications with fire teams and with outside stations are managed in accordance with vessel's procedures, regulatory requirements and established fire fighting practice.

<p>3. Liaise with shore-based agencies</p>	<ul style="list-style-type: none"> a. Strategies for shipboard fire fighting management in port are developed with the regard to the Navigation Act, local fire regulations and regulations of the relevant port authority b. Appropriate liaison is maintained with relevant shore-based fire-fighting, emergency and port authorities in accordance with regulatory requirements and established fire fighting and emergency practices and procedures c. Appropriate strategies are developed and implemented for rapid briefing of shore based fire-fighters and other shore-based emergency organisations in accordance with regulatory requirements and established marine fire-fighting practice d. Appropriate strategies are developed and used for overcoming language barriers when communicating with shore based fire fighters
<p>4. Supervise the operation of fixed fire suppression systems</p>	<ul style="list-style-type: none"> a. The serviceability of fixed fire suppression systems is periodically checked in accordance with vessel's procedures, manufacturer's instructions and regulatory requirements b. Fixed fire fighting systems are correctly activated when required in accordance with vessel's procedures, manufacturer's instructions and regulatory requirements
<p>5. Develop and implement on-board fire fighting training exercises</p>	<ul style="list-style-type: none"> a. On board fire fighting training exercises are developed that are appropriate for the vessel type and are in accordance with established training practice, regulatory requirements and company procedures. b. On board fire fighting training arrangements comply with the requirements of maritime regulations c. Strategies for effective debriefing of fire fighting training exercises are developed and implemented in accordance with established training practice d. Fire fighting training exercises are evaluated in accordance with established training practice and company procedures e. Appropriate improvements are made to fire fighting exercises based on feedback provided through debriefings and evaluation findings
<p>6. Manage the evacuation of personnel from fire and smoke affected compartments</p>	<ul style="list-style-type: none"> a. Evacuation plans are prepared in accordance with the vessel's safety management system, regulatory requirements and established marine fire fighting practice b. Controlled ventilation is correctly used to keep occupied compartments smoke free c. The likely actions of passengers are anticipated and appropriate action is taken to ensure they comply with planned evacuation procedures d. Search and rescue operations for missing personnel are planned and implemented in accordance with the vessel's safety management system, regulatory requirements and established marine fire fighting practice e. The handling and treatment of injured personnel is coordinated in accordance with the vessel's safety management system, first aid and regulatory requirements and established marine fire fighting practice
<p>7. Manage fire prevention and suppression activities involving hazardous goods</p>	<ul style="list-style-type: none"> a. The vessel's hazardous goods stowage plan is located and correctly used in fire fighting and fire prevention activities. b. Appropriate material safety data sheets are obtained and interpreted in the event of a fire involving hazardous materials c. Fire prevention precautions in situations involving hazardous materials are correctly applied in accordance with the IMW Code and the vessel's safety management system d. Contingency plans for fires involving hazardous materials are prepared in accordance with the IMW Code and the vessel's safety management system e. Tactical methods for fighting fires involving hazardous materials are correctly applied in accordance with the IMW Code and the vessel's safety management system f. The BC Code is correctly applied in fire fighting and fire prevention situations and activities involving hazardous bulk cargoes
<p>8. Manage the maintenance of fire fighting equipment</p>	<ul style="list-style-type: none"> a. The routine maintenance of fire fighting and suppression equipment is coordinated in accordance with vessel's procedures, manufacturer's instructions, regulatory requirements and established fire fighting practice b. Arrangements are made for the replenishment, repair or replacement of faulty or depleted fire fighting and suppression equipment in accordance with vessel's procedures, manufacturer's instructions, regulatory requirements and established fire fighting practice c. Reports on routine maintenance and repair of fire fighting equipment are made in accordance with vessel's procedures and regulatory requirements

9. **Manage fire investigation and reporting activities**

- a. An area affected by fire is correctly secured prior to investigation in accordance with the vessel's safety management system, regulatory requirements and established marine fire-fighting practice
- b. The cause of a fire is determined using appropriate methods in accordance with established fire investigation practice
- c. A fire investigation report is completed in accordance with regulatory requirements and established marine fire-fighting practice
- d. Relevant agencies are notified in the event of a shipboard fire in accordance with company procedures, regulatory requirements and established marine fire-fighting practice

Range Of Variables

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the maritime regulations, tanker safety guides and port regulations related to prevention and fighting of fires on vessels. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of advanced fire-fighting principles, techniques and tactics and procedures to the management of fire fighting and prevention activities on-board vessel. Contribution to the development of a broad plan for fire-fighting and prevention operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the fighting and prevention fire on a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel. b. Fire-fighting may need be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Fire fighting equipment may include: <ul style="list-style-type: none"> c.1. portable fire extinguishers, including foam, water, CO₂, dry chemical, and wet foam c.2. CO₂ fixed systems c.3. foam installations, including semi-portable and fixed installations c.4. sprinkler systems c.5. fire pumps, including main and emergency fire pump c.6. fire hoses, hydrants, branches and international shore connection d. Fixed fire suppression systems may include: <ul style="list-style-type: none"> d.1. Carbon dioxide d.2. water spray d.3. Halon alternatives e. Fixed fire suppression systems may be installed in : <ul style="list-style-type: none"> e.1. cargo holds e.2. machinery spaces f. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> f.1. masks and goggles f.2. breathing apparatus f.3. resuscitation equipment f.4. protective clothing, including headgear, gloves and footwear f.5. escape and rescue equipment g. Hazards when fighting fires may include: <ul style="list-style-type: none"> g.1. burns g.2. smoke g.3. explosion g.4. poisonous fumes and gas g.5. instability caused by the free surface effect g.6. environmental hazards to air and water g.7. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents g.8. release of toxic fluids, vapours and gases, involving skin contact, ingestion and inhalation g.9. corrosion hazards to personnel, vessel structures and equipment g.10. working in confined spaces

Range Of Variables (continued)

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. safety management system documentation (including ISM Code where applicable) a.3. vessel's log a.4. fire-detection, fire- fighting and safety equipment operational and maintenance instructions and recommended procedures a.5. instructions of relevant Maritime Authorities related to the maintenance and serviceability of vessel-board fire-detection, fire- fighting and safety equipment and systems a.6. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of USL Code and AMSA Marine Orders a.3. national an international regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.4. ISM Code (where applicable) a.5. Navigation Act as it relates to fire emergencies a.6. State / Territory Fire Acts a.7. relevant international, Australian and State/Territory OH&S and pollution control legislation a.8. relevant regulations and legislation of port authorities and related shore-based emergency authorities

Evidence Guide

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none">a.1. Manage and implement fire fighting and fire prevention measures and procedures on-board a vessela.2. Coordinate activities to ensure the operational capability of fire-detection and fire- fighting equipment and systems and any required maintenance or replenishment actiona.3. Manage interior search and rescue and fire-fighting teams on-board a vessela.4. Manage the evacuation of personnel from fire and smoke affected compartmentsa.5. Manage fire prevention and suppression activities involving hazardous goodsa.6. Manage the maintenance of fire fighting and suppression equipmenta.7. Liaise with shore-based agencies during a fire emergencya.8. Manage fire investigation and reporting activitiesa.9. Coordinate on-board fire fighting traininga.10. Implement OHS and pollution control principles and regulations when managing fire prevention and fire-fighting activitiesa.11. Communicate effectively with others as required during fire prevention activities and fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of marine officers with a responsibility to manage the prevention, control and fighting of fires on-board a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none">a. Knowledge of sections of the relevant maritime regulationsb. Role and function of standard fire-fighting organisation models used on board vessels, including:<ul style="list-style-type: none">b.1. the role/function of the command team in a shipboard fire situationb.2. the roles of other fire fighting teams in a shipboard fireb.3. the role and duties of the scene leader in a shipboard fire scenarioc. The chemistry of fire and its relationship to materials typically carried on vesselsd. Principles underlying the spread of fire and its extinguishmente. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishmentf. The characteristics and hazards associated with fires on various vessel types and spacesg. Materials safety data sheets relevant to the various types of cargo carried on vesselsh. The importance of maintenance of fire detection and fire fighting equipment on board vesselsi. Types of fire-detection, fire- fighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenancej. Fire-fighting techniques applicable to different classes of fire on board a vesselk. Sources for information that available to the command team in a shipboard fire situationl. The implications of shipboard fire fighting management in port and procedures that must be followed to comply with port and state regulationsm. Problems that are likely to be encountered during the management of a shipboard fire and related tactics and solutions that can be appliedn. Relevant regulations, codes of practice, policies and procedures related to the to the maintenance of fire-detection, fire- fighting equipment and systemso. Methods for checking and replacing consumable materials in typical fire-detection and fire- fighting equipment and systems on board various types and sizes of vesselsp. The requirements for on-board fire fighting training, including:<ul style="list-style-type: none">p.1. basic training principles and practicep.2. on board firefighting training requirements as detailed in the AMSA Marine Ordersp.3. the importance of having aims and objectives for a training exercisep.4. procedures for evaluating and improving training activitiesq. Problems that can occur with fire-detection and fire- fighting equipment and operations on board a vessel and appropriate remedial action and solutions

Evidence Guide (continued)

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> r. The principle of operation of fixed fire suppression systems s. The procedure for the safe activation of fixed fire fighting systems t. The typical actions of passengers in a shipboard fire u. Maritime communication techniques applicable to the management of fire prevention and fire-fighting activities on board a vessel v. Strategies for rapid briefing of shore based fire fighters and other shore based emergency organisations w. Strategies for overcoming language barriers when communicating with shore based fire fighters x. Sources of information on fire prevention and extinguishment on board vessels
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to coordinate fire fighting and prevention strategies and manage interior search and rescue and fire-fighting teams on board vessels, and/or b. manage fire fighting and prevention strategies and interior search and rescue and fire-fighting teams in real and simulated fire emergency situations on board an operational vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards.</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. managing and implementing fire fighting and prevention measures and procedures on-board a commercial vessel a.2. coordinating activities to ensure the operational capability of fire-detection and fire-fighting equipment and systems and any required maintenance or replenishment action a.3. managing interior search and rescue and fire-fighting teams on-board a vessel a.4. managing the evacuation of personnel from fire and smoke affected compartments a.5. managing fire prevention and suppression activities involving hazardous goods a.6. managing the maintenance of fire fighting and suppression equipment a.7. liaising with shore-based agencies during a fire emergency a.8. managing fire investigation and reporting activities a.9. coordinating on-board fire fighting training b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. Relevant sections of IMO STCW Convention and Code, Australian USL Code and AMSA Marine Orders b.2. State/Territory fire regulations and legislation b.3. OHS regulations and hazard prevention policies and procedures b.4. pollution control regulations and legislation b.5. fire fighting and prevention procedures and policies b.6. job procedures and work instructions b.7. vessel's ISM Code safety management system (where applicable) b.8. relevant manufacturer's guidelines relating to the use of fire-detection and fire-fighting equipment and systems, including instructions on equipment capability and limitations b.9. following on-board housekeeping processes and fire-hazard prevention measures c. Action is taken promptly to report and/or rectify fire-related incidents in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	1	3	2

TDM MF14 01A PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers, including developing vessel emergency plans, carrying out emergency shutdown of gas cargo operations, operating cargo valve closing systems, taking special precautions when carrying out onboard maintenance operations, taking appropriate action in the event of failure of systems or services essential to gas cargo, and taking appropriate action following collision, stranding or envelopment of the vessel in toxic or flammable vapour.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and the AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Develop and implement operational and emergency plans relevant to liquefied gas tankers</p>	<ul style="list-style-type: none"> a. Plans for tanker operations are prepared in accordance with operational orders, company procedures, the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures b. Correct procedures are followed when operating cargo valve closing systems c. Safety and emergency procedures are planned and implemented in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures d. Tests, inspections and repairs of tanker machinery and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures e. Action is taken in the event of machinery or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved and shipboard emergency and contingency plans followed f. Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of liquefied gas cargo g. Emergency shutdown of liquefied gas cargo operations is initiated upon identification of a defined emergency situation in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures h. Escape equipment, breathing apparatus, personal protective clothing and equipment, resuscitation equipment, and decontamination equipment are correctly used in emergency situations in accordance with manufacturer's instructions, regulatory requirements and company procedures i. Appropriate action is taken following collision, stranding or envelopment of the vessel in toxic or flammable vapour in accordance with the vessel's emergency plans and procedures and relevant international and national codes, conventions and regulatory requirements j. All emergency and safety incidents are reported and recorded in accordance with the tanker's ISM Code Safety Management System, regulatory requirements and company procedures

2. **Take special precautions when carrying out maintenance operations on liquefied gas tankers**

- a. Special maintenance procedures are developed and implemented that take due account of the potential hazards that may occur during maintenance on a liquefied gas tanker
- b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, tanker and the environment
- c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations
- d. Personal protective clothing and equipment are correctly used when carrying out maintenance work on a liquefied gas tanker
- e. When required during maintenance operations, breathing apparatus is correctly used in accordance with manufacturer's instructions, regulatory requirements and company procedures
- f. Where relevant, procedures and precautions necessary for entry into a pump room, tanks or other confined spaces when carrying out maintenance operations on a liquefied gas tanker are correctly followed

Range Of Variables

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations, tanker safety guides and port regulations related to liquefied gas tanker safety and operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of special safety precautions, operational procedures and hazard minimisation strategies to the management of the operations, maintenance and emergency situations on a liquefied gas tanker. Contribution to the development of integrated safety management plan for a liquefied gas tanker is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the development and implementation of an ISM management plan for operations, maintenance activities and emergencies on a liquefied gas tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial liquefied gas tanker b. Operational, maintenance and emergency procedures may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during warm-up and cool-down procedures b.6. during tank cleaning b.7. during liquefied gas cargo condition maintenance b.8. during liquefied gas cargo sampling c. Operations on a liquefied gas tanker may include: <ul style="list-style-type: none"> c.1. cool-down of a gas free system from ambient temperature c.2. liquefied gas loading preparation and operations c.3. maintenance operations during a loaded voyage c.4. liquefied gas discharging preparation and operations c.5. warm-up and gas-freeing operations c.6. tank-stripping and cleaning operations c.7. ballasting operations and de-ballasting operations c.8. maintenance operations during a ballast voyage d. Liquefied gas cargo handling systems and equipment may include: <ul style="list-style-type: none"> d.1. pumps and pumping arrangements and vapour-return systems, piping systems and valves d.2. filters and strainers d.3. expansion devices d.4. flame screens d.5. commonly used inert gases d.6. storage, generation and distribution systems d.7. temperature and pressure monitoring systems d.8. cargo vent systems d.9. liquid re-circulation and re-liquefaction systems d.10. cargo gauging, instrumentation systems and alarms d.11. CO2 and gas detection and monitoring systems d.12. cargo boil-off systems and auxiliary systems. e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks, goggles and breathing apparatus e.2. resuscitation equipment e.3. protective clothing, including headgear, gloves and footwear e.4. escape and rescue equipment f. Hazards associated with liquefied gas cargoes may include: <ul style="list-style-type: none"> f.1. sources of ignition leading to explosion and fire f.2. electrostatic generation leading to discharge f.3. environmental hazards to air and water f.4. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.5. release of toxic fluids, vapours and gases, involving skin contact, ingestion and inhalation f.6. corrosion hazards to personnel, vessel structures and equipment f.7. working in confined spaces

Range Of Variables (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel's safety, maintenance and emergency procedures a.1. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to liquefied gas tankers a.3. 'Liquefied Gas Handling Principles on Ships and in Terminals' SIGTTO a.4. 'Tanker Safety Guide (Liquefied Gas)' ICS a.5. 'Ship to Ship Transfer Guide (Liquefied Gases)' ICS/OCIMF a.6. material safety data sheets a.7. tanker manufacturer's instructions and recommended procedures a.8. OHS and pollution prevention procedures relevant to the carriage of liquefied gas cargoes a.9. instructions of relevant Maritime Authorities concerning liquefied gas cargo operations and emergencies a.10. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to liquefied gas tankers a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and implement special safety, maintenance and emergency procedures on a liquefied gas tanker a.2. Identify typical safety, maintenance and emergency problems and hazards on a liquefied gas tanker and take appropriate action a.3. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to liquefied gas tanker operations a.4. Communicate effectively with others when carrying out special safety, maintenance and emergency procedures on a liquefied gas tanker
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a deck or engineering officer on a liquefied gas tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for liquefied gas tankers, including the IGC b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. The basic principles and trends in liquefied gas tanker design and the cargo containment and handling systems, including: <ul style="list-style-type: none"> c.1. types and design of liquefied gas tankers and their equipment c.2. cargo containment systems with special reference to rules, surveys, tank construction, materials, coatings, insulation and compatibility. c.3. cargo handling equipment including pumps and pumping arrangements and vapour return systems, and piping systems and valves c.4. cargo conditioning systems including warm-up and cool-down procedures c.5. tank atmosphere control systems including the use of inert gas and nitrogen c.6. instrumentation of cargo containment and handling systems including that of gauging, sampling and temperature control and pressure monitoring systems d. Safety procedures and regulatory requirements for loading, discharge, handling and condition monitoring of liquefied gas cargo including: <ul style="list-style-type: none"> d.1. cargo loading and discharging preparations and procedures d.2. the purpose and use of check lists, including the Ship/Shore checklist d.3. the importance of correct supervision and the use of monitoring equipment when handling liquefied gas cargoes d.4. cargo condition monitoring and maintenance on passage and in harbour d.5. liquefied gas cargo sampling procedures d.6. ballasting and de-ballasting procedures d.7. the warm up and gas freeing procedures d.8. the procedures for cool-down of a gas-free system from ambient temperature and the safety precautions involved e. Special safety precautions with respect to repair and maintenance work on a liquefied gas tanker, including: <ul style="list-style-type: none"> e.1. an understanding of the types of hazards and their causes e.2. safety and hazard minimisation procedures used on liquefied gas tankers e.3. the design features of the vessels which control the major hazards on a liquefied gas tanker e.4. health hazards of liquefied gas cargoes and the means to prevent related safety incidents e.5. basic toxicological terminology e.6. routes of entry of toxins to the human body e.7. special first aid measures which may be required on a liquefied gas tanker, including administering antidotes when dealing with a safety incident involving liquefied gases f. Principles and procedures for emergency operations on a liquefied gas tanker, including: <ul style="list-style-type: none"> f.1. the importance of developing vessel emergency plans f.2. techniques for emergency shutdown of cargo operations on a liquefied gas tanker f.3. actions to be taken in the event of failure of services essential to liquefied gas cargo f.4. actions to be taken on a liquefied gas tanker following a collision, stranding, spillage or envelopment of the vessel in toxic or flammable vapour f.5. the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, rescue equipment and protective clothing and equipment f.6. procedures for entry into and effecting a rescue from enclosed spaces on a tanker f.7. importance of supervising personnel during potentially hazardous operations f.8. types and principles of certified safe electrical equipment and sources of ignition

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

3. Required knowledge and skills (continued)	g. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of oil cargo
4. Resource implications	Access is required to opportunities to either: a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers, and/or b. plan and implement special safety, maintenance and emergency procedures on board an operational liquefied gas tanker
5. Consistency in performance	a. Applies underpinning knowledge and skills when: a.1 planning and implementing special safety, maintenance and emergency procedures for liquefied gas tankers a.2 identifying and evaluating liquefied gas cargo safety, maintenance and emergency problems and hazards and determining appropriate courses of action a.3 identifying and implementing improvements to liquefied gas cargo safety, maintenance and emergency procedures b. Shows evidence of application of relevant workplace procedures including: b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS and pollution control regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the conduct of maintenance on liquefied gas tankers b.4 pollution management processes c. Action is taken promptly to report and/or rectify operational accidents and incidents in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF15 01A PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to plan and implement special safety, maintenance and emergency procedures for chemical tankers, including developing vessel emergency plans, carrying out emergency shutdown of chemical cargo operations, , taking special precautions when carrying out onboard maintenance operations, applying medical first aid in relation to chemical cargo accidents, using resuscitation and decontamination equipment and breathing apparatus and escape equipment, carrying out safe entry into and rescue from enclosed spaces, and taking appropriate action following collision, stranding or chemical spillage.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Develop and implement operational and emergency plans relevant to chemical tankers</p>	<ul style="list-style-type: none"> a. Plans for tanker operations are prepared in accordance with operational orders, company procedures, the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures b. Safety and emergency procedures are planned and implemented in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures c. Tests, inspections and repairs of tanker machinery and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures d. Action is taken in the event of machinery or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved and shipboard emergency and contingency plans followed e. Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of chemical cargo f. Emergency shutdown of chemical cargo operations is initiated upon identification of a defined emergency situation in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures g. Escape equipment, breathing apparatus, personal protective clothing and equipment, resuscitation equipment, and decontamination equipment are correctly used in emergency situations in accordance with manufacturer's instructions, regulatory requirements and company procedures h. Appropriate action is taken following collision, stranding, or chemical spillage in accordance with the vessel's emergency plans and procedures and relevant international and national codes, conventions and regulatory requirements i. Appropriate medical first aid is applied in relation to chemical cargo accidents in accordance with established first aid practice and company procedures j. All emergency and safety incidents are reported and recorded in accordance with the tanker's ISM Code Safety Management System, regulatory requirements and company procedures

2. Take special precautions when carrying out maintenance operations on chemical tankers
 - a. Special maintenance procedures are developed and implemented that take due account of the potential hazards that may occur during maintenance on a chemical tanker
 - b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, tanker and the environment
 - c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations
 - d. Personal protective clothing and equipment are correctly used when carrying out maintenance work on a chemical tanker
 - e. When required during maintenance operations, breathing apparatus is correctly used in accordance with manufacturer's instructions, regulatory requirements and company procedures
 - f. Where relevant, procedures and precautions necessary for entry into a pump room, tanks or other confined spaces when carrying out maintenance operations on a chemical tanker are correctly followed

Range Of Variables

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations, tanker safety guides and port regulations related to chemical tanker safety and operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of special safety precautions, operational procedures and hazard minimisation strategies to the management of the operations, maintenance and emergency situations on a chemical tanker. Contribution to the development of integrated safety management plan for a chemical tanker is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the development and implementation of an ISM management plan for operations, maintenance activities and emergencies on a chemical tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial chemical tanker b. Operational, maintenance and emergency procedures may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during chemical cargo condition monitoring and maintenance b.6. during chemical cargo sampling c. Operational cargo handling cycle of a chemical tanker may include: <ul style="list-style-type: none"> c.1. chemical cargo loading preparation and operations c.2. cargo monitoring and maintenance operations during a loaded voyage c.3. chemical cargo discharging preparation and operations c.4. tank-stripping and cleaning operations c.5. ballasting operations c.6. maintenance operations during a ballast voyage c.7. de-ballasting operations d. Chemical cargo handling systems and related equipment may include: <ul style="list-style-type: none"> d.1. chemical cargo pumps and pumping arrangements and venting and vapour return systems, piping systems and valves d.2. tank temperature control systems and alarms d.3. filters and strainers d.4. gas freeing systems d.5. storage, generation and distribution systems d.6. temperature and pressure monitoring systems d.7. cargo vent systems d.8. cargo vapour return systems d.9. tank cleaning systems d.10. liquid re-circulation and re-liquefaction systems d.11. cargo gauging, instrumentation systems and alarms e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks and goggles e.2. protective clothing, including headgear, gloves and footwear e.3. breathing apparatus e.4. resuscitation equipment e.5. escape and rescue equipment f. Hazards associated with chemical cargoes may include: <ul style="list-style-type: none"> f.1. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.2. environmental hazards to air and water f.3. spills or release of toxic fluids, vapours and gases, involving skin contact, inhalation and ingestion f.4. corrosion hazards to personnel, vessel structures and equipment f.5. working in confined spaces

Range Of Variables (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel's safety, maintenance and emergency procedures a.3. established tanker and company chemical cargo operations procedures a.1. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to chemical tankers a.4. 'Safety in Chemical Tankers' ICS a.5. 'Tanker Safety Guide (Chemical Tankers) ICS a.6. 'International Safety Guide for Oil Tankers and Terminals' ICS/OCIMF a.7. 'Ship to Shore Safety Checklist' ICS/OCIMF a.8. 'Ship to Ship Transfer Guide (Petroleum) ICS/OCIMF a.9. material safety data sheets a.10. tanker manufacturer's instructions and recommended procedures a.11. OHS and pollution prevention procedures relevant to the handling of chemical cargoes a.12. instructions of relevant Maritime Authorities concerning chemical cargo operations a.13. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include:</p> <ul style="list-style-type: none"> a.1. sections of the IMO STCW 95 Code and Convention related to chemical tankers a.2. relevant sections of AMSA Marine Orders a.3. instructions of relevant Maritime Authorities concerning chemical cargo operations a.1. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and implement special safety, maintenance and emergency procedures on a chemical tanker a.2. Identify typical safety, maintenance and emergency problems and hazards on a chemical tanker and take appropriate action a.3. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to chemical tanker cargo operations a.4. Communicate effectively with others when carrying out special safety, maintenance and emergency procedures on a chemical tanker
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a deck or engineering officer on a chemical tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for chemical tankers b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. Safety procedures and regulatory requirements for loading, discharge, handling and condition monitoring of chemical cargo including: <ul style="list-style-type: none"> c.1. typical calculations required when coordinating the handling of chemical cargo c.2. procedures for the preparation of loading and discharge plans for multiple grade tanker cargoes with due regard to cargo segregation and cargo care on passage. c.3. cargo loading and discharging preparations and procedures c.4. the purpose and use of check lists, including the Vessel/Shore checklist c.5. the importance of correct supervision and the use of monitoring equipment when handling chemical cargoes c.6. cargo condition monitoring and maintenance on passage and in harbour c.7. principles and procedures for the segregation of cargoes c.8. procedures for cargo transfer and changing cargoes c.9. the use and maintenance of inert atmospheres during cargo operations c.10. procedures for controlling entry into pumprooms and confined spaces c.11. the principle of operation of gas detection and safety equipment c.12. gas detection and safety equipment requirements for various shipboard scenarios on a chemical tanker c.13. procedures to prevent air and water pollution including disposal of wastes and washings c.14. the procedure for tank cleaning and gas freeing operations, including the use of absorption, wetting agents and detergents c.15. cargo gauging, sampling and testing c.16. ballasting and de-ballasting c.17. emergency procedures, i.e. pre-planned action in the event of spillages, leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty d. Special safety precautions with respect to repair and maintenance work on a chemical tanker, particularly maintenance activities that affect pumping, piping, electrical and control system. which may be contaminated with toxic vapours or liquid e. The hazards associated with chemical cargoes, including: <ul style="list-style-type: none"> e.1. an understanding of the types of hazards and their causes e.2. safety and hazard minimisation procedures used on chemical tankers e.3. the design features of the vessels which minimise or eliminate the major hazards on a chemical tanker e.4. potential health hazards of various chemical cargoes and the means to prevent related safety incidents e.5. basic toxicological terminology e.6. routes of entry of toxins to the human body e.7. special first aid measures which may be required on a chemical tanker, including administering antidotes when dealing with a safety incident involving chemicals f. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of chemical cargo

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

<p>3. Required knowledge and skills (continued)</p>	<p>g. Principles and procedures for emergency operations on a chemical tanker, including:</p> <ul style="list-style-type: none"> g.1. the importance of developing vessel emergency plans g.2. techniques for emergency shutdown of cargo operations on a chemical tanker g.3. actions to be taken in the event of failure of services essential to chemical cargo g.4. actions to be taken on a chemical tanker following a collision, grounding or spillage g.5. the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, protective clothing and decontamination equipment g.6. procedures for entry into and effecting a rescue from enclosed spaces on a chemical tanker <p>h. Principles of chemical cargo containment, including:</p> <ul style="list-style-type: none"> h.1. containment systems h.2. rules h.3. surveys h.4. tank construction h.5. materials h.6. coatings h.7. temperature control h.8. insulation h.9. compatibility h.10. medical first aid and administering of antidotes. <p>i. The properties and characteristics of chemicals and their vapours, including:</p> <ul style="list-style-type: none"> i.1. the characteristics of chemicals typically carried i.2. toxicity of various chemical cargoes i.3. critical temperatures of typical chemical cargoes i.4. hazards of typical chemical cargoes and measures for hazard control i.5. safety guides applicable for typical chemical cargoes carried <p>j. Basic principles of toxicity of chemicals, including</p> <ul style="list-style-type: none"> j.1. the modes by which chemicals and their vapours may be toxic j.2. the toxic properties of inhibitors and of products of combustion of both materials of construction and of chemicals carried j.3. acute and chronic effects of toxicity, j.4. systemic poisons and irritants j.5. the Threshold Limit Value (TLV) j.6. hazards of skin contact, inhalation and ingestion
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to plan and implement special safety, maintenance and emergency procedures for chemical tankers, and/or b. plan and implement special safety, maintenance and emergency procedures on board an operational chemical tanker
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning and implementing special safety, maintenance and emergency procedures for chemical tankers a.2 identifying and evaluating chemical cargo safety, maintenance and emergency problems and determining appropriate courses of action a.3 identifying and implementing improvements to chemical cargo safety, maintenance and emergency procedures b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS and pollution control regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations b.4 ISM Code safety management system and quality procedures (where existing) b.5 following on-board housekeeping processes b.6 pollution management processes c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF16 01A PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR OIL TANKERS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to plan and implement special safety, maintenance and emergency procedures for oil tankers, including developing vessel emergency plans, carrying out emergency shutdown of oil cargo operations, taking special precautions when carrying out onboard maintenance operations, taking appropriate action in the event of failure of systems or services essential to oil cargo, applying medical first aid in relation to oil cargo accidents, using resuscitation equipment and breathing apparatus for safe entry into and rescue from enclosed spaces, and taking appropriate action following collision, stranding or oil spillage.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
1. Develop and implement operational and emergency plans relevant to oil tankers	<ul style="list-style-type: none"> a. Plans for tanker operations are developed are prepared in accordance with operational orders, company procedures, the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures b. Safety and emergency procedures are planned and implemented in accordance with the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures c. Tests, inspections and repairs of tanker machinery and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures d. Action is taken in the event of machinery, pump, valve or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved in accordance with shipboard emergency and contingency plans followed e. Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of oil and petroleum cargo f. Emergency shutdown of oil cargo operations is initiated upon identification of a defined emergency situation in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures g. Escape equipment, breathing apparatus, personal protective clothing and equipment, resuscitation equipment, and decontamination equipment are correctly used in emergency situations in accordance with manufacturer's instructions, regulatory requirements and company procedures h. Appropriate action is taken following collision, stranding or oil spillage in accordance with the vessel's emergency plans and procedures, the requirements of relevant port authorities, and relevant international and national codes, conventions and regulatory requirements i. Appropriate medical first aid is applied in relation to oil cargo accidents and emergencies in accordance with established first aid practice and company procedures j. All emergency and safety incidents are reported and recorded in accordance with the tanker's ISM Code Safety Management System, regulatory requirements and company procedures

2. Take special precautions when carrying out maintenance operations on oil tankers
 - a. Special maintenance procedures are developed and implemented that take due account of the potential hazards that may occur during maintenance on a oil tanker
 - b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, tanker and the environment
 - c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations
 - d. Personal protective clothing and equipment are correctly used when carrying out maintenance work on a oil tanker
 - e. When required during maintenance operations, breathing apparatus is correctly used in accordance with manufacturer's instructions, regulatory requirements and company procedures
 - f. Where relevant, procedures and precautions necessary for entry into a pump room, tanks or other confined spaces when carrying out maintenance operations on a oil tanker are correctly followed

Range Of Variables

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations, tanker safety guides and port regulations related to oil tanker safety, operations and pollution control. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of special safety precautions, operational procedures and hazard minimisation strategies to the management of the operations, maintenance and emergency situations on an oil tanker. Contribution to the development of integrated safety management plan for an oil tanker is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the development and implementation of an ISM management plan for operations, maintenance activities and emergencies on an oil tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial oil tanker b. Operational, maintenance and emergency procedures may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during tank cleaning b.6. during crude oil washing procedures b.7. during oil cargo monitoring and maintenance b.8. during oil cargo sampling c. Operational cargo handling cycle of a oil tanker may include: <ul style="list-style-type: none"> c.1. oil loading preparation and operations c.2. load-on-top operations c.3. monitoring and maintenance operations during a loaded voyage c.4. oil discharging preparation and operations c.5. tank-stripping and cleaning operations c.6. ballasting operations c.7. maintenance operations during a ballast voyage c.8. de-ballasting operations d. Oil cargo handling systems and equipment may include: <ul style="list-style-type: none"> d.1. pumps and pumping arrangements and venting and vapour-return systems, piping systems and valves d.2. filters and strainers d.3. expansion devices d.4. flame screens d.5. commonly used inert gases d.6. storage, generation and distribution systems d.7. temperature and pressure monitoring systems d.8. inert gas systems d.9. gas-freeing systems d.10. cargo gauging, instrumentation systems and alarms d.11. gas detection and monitoring systems e. Personal protective clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks and goggles e.2. breathing apparatus e.3. resuscitation equipment e.4. protective clothing, including headgear, gloves and footwear e.5. escape and rescue equipment

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

<p>2. Worksite environment (continued)</p>	<p>f. Hazards associated with oil cargoes may include:</p> <ul style="list-style-type: none"> f.1. sources of ignition leading to explosion and fire f.2. electrostatic generation leading to discharge f.3. environmental hazards to air and water f.4. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.5. spills or release of toxic fluids, vapours and gases, involving skin contact and inhalation f.6. corrosion hazards to personnel, vessel structures and equipment f.7. working in confined spaces
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel's safety, maintenance and emergency procedures a.3. established tanker and company oil cargo operations procedures a.4. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to oil tankers a.5. 'International Safety Guide for Oil Tankers and Terminals' ICS/OCIMF a.6. 'Ship to Ship Transfer Guide (Petroleum)' ICS/OCIMF a.7. 'Clean Seas Guide for Oil Tankers (Retention of Oil Residues on Board)' ICS/OCIMF a.8. material safety data sheets a.9. tanker manufacturer's instructions and recommended procedures a.10. OHS procedures relevant to the handling of oil cargoes a.11. instructions of relevant Maritime Authorities concerning oil cargo operations a.12. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to oil tankers a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and implement special safety, maintenance and emergency procedures on an oil tanker a.2. Identify typical safety, maintenance and emergency problems and hazards on an oil tanker and take appropriate action a.3. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to oil tanker operations a.4. Communicate effectively with others when carrying out special safety, maintenance and emergency procedures on an oil tanker
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a deck or engineering officer on an oil tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for oil tankers b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. The basic principles and trends in oil tanker design and the cargo containment and handling systems, including: <ul style="list-style-type: none"> c.1. typical piping and pumping arrangements c.2. typical deck arrangements c.3. cargo tank arrangements c.4. types of cargo pumps and their application to various types of oil and petroleum cargo c.5. tank cleaning, gas freeing and inerting systems c.6. the major components of an inert gas plant c.7. cargo tank venting and accommodation ventilation systems and procedures c.8. the requirements of shipboard gauging systems and their associated instrumentation and alarms c.9. the requirements for cargo heating systems on oil tankers c.10. the safety aspects of electrical systems on oil tankers d. Procedures and regulatory requirements for loading, discharge, handling and condition monitoring of oil cargo, including: <ul style="list-style-type: none"> d.1. cargo loading and discharging preparations and procedures d.2. loading and discharge plans for multiple grade tanker cargoes with due regard to cargo segregation and cargo care on passage. d.3. loading and discharging procedures including vessel-to-vessel transfers d.4. the use of check lists including the vessel/shore checklist. d.5. the importance of correct supervision and use of monitoring equipment d.6. the procedure for tank cleaning and gas freeing operations d.7. crude oil washing procedures d.8. the use and maintenance of inert gas atmospheres during cargo handling operations and its role in the gas freeing process d.9. regulations and procedures for the control of entry into pumprooms and confined spaces d.10. the principle of operation of gas detection equipment d.11. appropriate gas detection equipment for given shipboard scenarios d.12. the use of load-on-top techniques are explained. d.13. proper ballasting and de-ballasting procedures are described. d.14. procedures to prevent air and water pollution including disposals of wastes and washings d.15. emergency procedures, i.e. pre-planned action in the event of leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty e. Oil cargo handling systems and equipment and the procedures for their use f. The chemical and physical characteristics of oil cargoes, including: <ul style="list-style-type: none"> f.1. the basic chemistry of hydrocarbons and simple chemical reactions f.2. the physical characteristics of a variety of oil cargoes f.3. the practical significance of flashpoint, flammable range and auto-ignition temperature g. Special precautions and procedures when carrying out repairs and maintenance on oil tankers <ul style="list-style-type: none"> g.1. the special safety factors and precautions necessary in the performance of hot work on an oil tanker g.2. correct hot work procedures, including requirements for permits to carry out work g.3. safety precautions with respect to repair and maintenance work including that affecting pumping, piping, electrical and control systems which may be contaminated with toxic vapours or liquid

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

<p>3. Required knowledge and skills (continued)</p>	<p>a. The hazards associated with oil cargoes, including:</p> <ul style="list-style-type: none"> a.1. an understanding of the types of hazards and their causes a.2. safety and hazard minimisation procedures used on oil tankers a.3. the sources of ignition that may be present on tankers a.4. the principles of electrostatic generation are described, and the possible situations which might lead to a discharge aboard a tanker a.5. the design features of the vessels which minimise or eliminate the major hazards a.6. the health hazards of associated cargoes are detailed and the means to prevent incidents <p>b. Principles and procedures for emergency operations on an oil tanker, including:</p> <ul style="list-style-type: none"> b.1. the importance of developing tanker emergency plans b.2. techniques for emergency shutdown of cargo operations b.3. actions to be taken in the event of failure of services essential to oil cargo b.4. actions to be taken following a collision, grounding or spillage, including a vapour release from an oil tanker b.5. the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, rescue equipment, decontamination equipment and protective clothing and equipment b.6. the procedures for entry into and effecting a rescue from enclosed spaces <p>c. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of oil cargo</p>
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to plan and implement special safety, maintenance and emergency procedures on a oil tanker, and/or b. plan and implement special safety, maintenance and emergency procedures on a on board an operational oil tanker
<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. planning and implementing special safety, maintenance and emergency procedures for oil tankers a.2. identifying and evaluating oil cargo safety, maintenance and emergency problems and hazards and determining appropriate courses of action a.3. identifying and implementing improvements to oil cargo safety, maintenance and emergency procedures <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2. OHS and pollution control regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on the conduct of maintenance on oil tankers b.4. job procedures and work instructions b.5. following on-board housekeeping processes b.6. pollution management processes <p>c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF18 01A APPLY MEDICAL FIRST AID ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to provide medical first aid on board a vessel in accordance with procedures as specified in the publications: (1) 'International Medical Guide for Ships', (2) Medical Section of the 'International Code of Signals' and (3) 'Medical First Aid Guide for Use in Accidents involving Dangerous Goods'. This includes providing first aid in a medical emergency on-board a vessel, seeking assistance from shore-based medical advisers where necessary and carrying out first aid as directed from shore-based medical advisers.

The unit is consistent with the related functional standard in Sections A II/2 and AIII/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2 and Appendix 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Provide medical first aid on board a vessel.</p>	<ul style="list-style-type: none"> a. A patient condition assessment is carried out in accordance with established first aid procedures and the nature of injury or illness is established b. Appropriate first aid procedures are used to manage the identified injury or illness in accordance with the officer's limits of responsibility c. Where there are doubts over the seriousness of the injury or illness and how to treat the patient, assistance is sought from senior officers or shore-based medical advisers d. Aseptic techniques are applied during any wound dressing e. The position of the patient is adjusted to optimise personal comfort for the medical condition or injury concerned f. Hygiene measures are used that are appropriate for the degree of illness or injury g. Cardio-pulmonary resuscitation techniques are correctly applied where required h. Oxi-viva equipment is used where required in accordance with safety procedures and instructions i. Condition of the patient is regularly monitored both visually and through appropriate measures of bodily signs j. Health precautions and disease prevention measures are implemented in accordance with regulatory requirements and company procedures k. Appropriate action is taken if there are signs of a deterioration in the condition of the patient
<p>2. Seek assistance from shore-based medical advisers</p>	<ul style="list-style-type: none"> a. Correct procedures are used to access radio medical advice when necessary to provide first aid in a medical emergency on board a vessel b. Protocols and procedures required when seeking radio medical advice for accident and injury are followed
<p>3. Carry out first aid procedures as directed from shore-based medical advisers</p>	<ul style="list-style-type: none"> a. Symptoms, signs and descriptions of assessments made of a patient's condition are relayed to the shore-based adviser b. First aid procedures are carried out as directed by the shore-based advisers c. Advice from shore-based advisers is complemented by reference to relevant marine publications on medical care on board a vessel

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|---|--|
| 4. Maintain vessel's medicine resources. | a. The vessel's medicine resources are maintained in accordance with company procedures and health regulations
b. Records are kept of the storage and use of medicine resources in accordance with regulatory requirements and company procedures |
| 5. Maintain medical records. | a. Records of medical first aid provided on-board a vessel are kept in accordance with regulatory requirements and company procedures |

Range Of Variables

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of a knowledge of the basic techniques required to provide first aid to crew and/or passengers during a medical emergency on board a vessel. Provision of first aid in accordance with company procedures and limits of officer's/rating's responsibility is required. c. Work requires appropriate skill in recognising and confirming the nature and extent of injury or illness and the provision of first aid within the limits of responsibility. First aid may be provided under remote direction and advice from shore-based medical advisers.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Medical first aid procedures may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway or at anchor b.4. during quarantine procedures when entering port c. Medical emergencies may include <ul style="list-style-type: none"> c.1. heart attack c.2. stroke c.3. asthma c.4. diabetes c.5. epilepsy d. Management of injuries on board a vessel may include: <ul style="list-style-type: none"> d.1. external bleeding d.2. an amputation d.3. a foreign body in the eye d.4. a penetrating chest wound d.5. a nose bleed d.6. internal bleeding d.7. fractures, sprains, strains and dislocations d.8. electric shock d.9. asphyxia e. Conditions requiring special first aid procedures may include: <ul style="list-style-type: none"> e.1. explosion injuries e.2. burns e.3. poisons and envenomation e.4. hypothermia and hyperthermia f. Medicine resources may include: <ul style="list-style-type: none"> f.1. vessel's medicine cabinet f.2. first aid boxes f.3. emergency first aid carry bags
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Sections of relevant maritime regulations dealing with the administration of medical first aid on board a vessel a.2. International Medical Guide for Ships a.3. Medical Section of the 'International Code of Signals' a.4. Medical First Aid Guide for Use in Accidents involving Dangerous Goods a.5. Marine Drug Guide a.6. vessel's log a.7. vessel medical records a.8. shipboard patients' health records a.9. drug register a.10. instructions of relevant maritime, health and quarantine authorities related to the medical care of crew and passengers on board a vessel

Range Of Variables (continued)

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. the Australian USL Code a.4. relevant international, Australian and State/Territory health and quarantine regulations a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Identify and prioritise the need for medical first aid in life-threatening medical emergencies a.2. Administer medical first aid on board a vessel a.3. Administer critical first aid procedures as directed from shore-based medical advisers a.4. Manage medicine resources on board a vessel a.5. Communicate effectively with others during medical emergencies and health care a.6. Maintain medical records in accordance with company and regulatory requirements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant sections of maritime regulations b. ISM Safety Management System procedures (where applicable) c. Emergencies, injuries and medical problems that may occur on board a vessel and appropriate action, treatments and solutions d. Relevant OH&S and health legislation and policies e. Duties and responsibilities of the designated first aid officer on board a vessel f. Medical first aid procedures g. DRABC action plans for various first aid situations h. Shipboard procedures for: <ul style="list-style-type: none"> h.1. conducting an initial patient first aid assessment h.2. managing injuries h.3. managing medical emergencies h.4. carrying out resuscitation techniques h.5. managing medicine resources i. Techniques for care of wounds j. Ways in which disease can spread on board a vessel and ways of preventing the spread k. Legal issues related to the administration of drugs and medicines on board a vessel l. Knowledge of body structures and functions relevant to possible injury, illnesses and disease that may be encountered on board a vessel m. Maritime communication techniques related to health care and receiving radio medical advice from shore-based advisers n. Marine publications containing information on first aid and medical treatment on board a vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to provide first aid to injured or ill crew and passengers and/or b. assist in the real or simulated medical first aid procedures on board an operational vessel <p><i>Note:</i> Simulated first aid situations and assessments may require access to resuscitation mannequins, auxiliary resuscitation items, disposable gloves, bandages, pads, gauzes, slings, water squeeze bottle or tap, pictures of venomous animals/insects or preserved specimens, and blankets pillows and towels</p>

Evidence Guide (continued)

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 providing medical care on board a vessel a.2 identifying and evaluating medical problems and emergencies and taking appropriate courses of action a.3 identifying and implementing improvements to medical care on board a vessel a.4 applying aseptic and other precautionary techniques when carrying out medical procedures on board a vessel a.5 assessing operational capability of vessel and manoeuvring plant and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 Relevant maritime regulations b.2 OHS regulations and medical care policies and procedures b.3 relevant medical and first aid instructions b.4 shipboard safety procedures <p>c. Action taken promptly to report and/or rectify injuries and medical incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3	1	3	2

TDM MF19 01A OPERATE LIFE-SAVING APPLIANCES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to operate life-saving appliances and equipment, including survival craft and rescue boats, their launching appliances and arrangements, and their equipment such as radio, life saving equipment, satellite EPIRBs, SARTs, immersion suits and thermal protective aids. It also includes skills and knowledge to organise abandon vessel drills in accordance with accepted practices, standards and emergency procedures.

The unit is consistent with the related functional standard in Sections A II/2 and III/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5 Appendices 2 and 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Launch and operate survival craft and rescue boats</p>	<ul style="list-style-type: none"> a. Preparations for the launch of survival craft or rescue boat are made in accordance with vessel's procedures and manufacturer's directions b. An appropriate launch strategy is adopted following an assessment of weather and sea conditions and the nature of the emergency situation c. Launching equipment is operated in accordance with vessel's instructions and accepted nautical practice d. Survival craft is launched smoothly in accordance with vessel's instructions and regulatory requirements e. Pre-start checks are made on the engine of the survival craft f. The survival craft engine is started using the sequence of actions provided in vessel' procedures and manufacturer's instructions g. Orders are given for survivors to board the survival craft using the appropriate means h. The survival craft is cleared of the vessel and operated in accordance with manufacturer's instructions and accepted nautical practice i. Appropriate handling strategies are applied to manoeuvre the survival craft in rough weather and sea conditions j. Sea anchors and drogues are deployed in accordance with accepted nautical practice k. Survivors displaying signs of hypothermia or other distress are identified and treated in accordance with accepted survival medical practice l. Exposure cover is deployed on an open lifeboat in accordance with accepted survival practice and manufacturer's instructions m. Strategies are adopted and implemented to counter threats to survival following the abandonment of a vessel in accordance with accepted survival practice n. Food and water is rationed to survivors in accordance with accepted survival practice
<p>2. Operate life saving and survival equipment</p>	<ul style="list-style-type: none"> a. Location and accessibility of all life-saving and survival equipment is established b. Survival equipment is checked and operated in accordance with instructions and accepted survival practice c. Survival radio equipment is operated in accordance with manufacturer's instructions and regulatory protocols d. Immersion suit, various thermal protective aids, life-jacket and other life-saving clothing are correctly donned and used in accordance with instructions e. Faulty life-saving equipment is identified and reported to enable prompt repair and/or replacement

<p>3. Recover survival craft</p>	<ul style="list-style-type: none"> a. Persons are disembarked from the survival craft in accordance with vessel's procedures b. The survival craft is recovered using the sequence of actions provided in vessel' procedures and manufacturer's instructions c. Survival craft is checked for signs of damage d. Identified damage or faulty equipment on the survival craft is reported in accordance with vessel's procedures
<p>4. Participate in abandon vessel drills</p>	<ul style="list-style-type: none"> a. Participation in organisation and conduct of abandon vessel musters and drills is consistent with regulatory requirements and company procedures b. Instruction is provided to others, when required, on the correct use of life-saving equipment and procedures to be followed in the event of the order to abandon vessel c. Documentation on the checking and replenishment of consumable materials used in life saving, fire detection, fire fighting and other safety system is completed in accordance with company procedures and regulatory requirements

Range Of Variables

OPERATE LIFE-SAVING APPLIANCES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of established maritime survival principles and practices to the launching and operation of survival craft, the use of survival equipment and the regular involvement in 'abandon vessel' drills. Implementation of established survival strategies and procedures is involved. Limited accountability and responsibility for self and others in achieving the outcomes is involved..
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Launching and operation of survival craft and equipment may take place: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. while hove to b.5. while anchored or moored b.6. in appropriately simulated situations c. Survival craft may include: <ul style="list-style-type: none"> c.1. free-fall life boats c.2. davit-launched life-boats c.3. life rafts c.4. rescue boats d. Life-saving and survival equipment may include: <ul style="list-style-type: none"> d.1. life jackets d.2. life buoys d.3. hard hats d.4. immersion suits and other thermal protective aids d.5. rocket line throwing appliances d.6. pyrotechnic distress signals d.7. GMDSS survival craft VHF radios d.8. Satellite emergency position indicating radio beacons EPIRBs d.9. SARTs d.10. whistles e. Consumable materials and items that may used in life saving equipment may include: <ul style="list-style-type: none"> e.1. batteries for detectors, radios, beacons, etc. e.2. flares e.3. survival rations f. In-water survival techniques may include: <ul style="list-style-type: none"> f.1. swimming in a life-jacket f.2. towing with a life jacket f.3. remaining afloat without a life jacket f.4. donning a life jacket in water f.5. the group huddle f.6. heat escape lessening posture g. Threats to survival after abandoning vessel may include: <ul style="list-style-type: none"> g.1. cold water shock g.2. hypothermia g.3. psychological response to disaster g.4. loss of will to live g.5. sea sickness g.6. dehydration g.7. injuries g.8. starvation

Range Of Variables (continued)

OPERATE LIFE-SAVING APPLIANCES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. Relevant maritime regulations a.2. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) a.1. SOLAS regulations a.2. AMSA publication 'Survival at Sea – a Training and Instruction Manual' a.3. vessel's log a.4. instructions from official search and rescue authorities a.5. vessel's procedures for emergency response including abandoning vessel a.6. manufacturer's instructions for the use of survival craft and equipment a.7. instructions of relevant Maritime Authorities related to survival at sea a.8. relevant OH&S legislation, codes of practice, policies and procedures a.9. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention dealing with survival at sea and use of survival craft and equipment a.2. relevant sections of AMSA Marine Orders dealing with survival at sea and use of survival craft and equipment a.3. relevant sections of the Australian USL Code dealing with survival at sea and use of survival craft and equipment a.4. Safety of Life at Sea (SOLAS) regulations a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

OPERATE LIFE-SAVING APPLIANCES

1. Critical aspects of evidence to be considered	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none">a.1. Launch and operate the various types of survival craft in suitably simulated situationsa.2. Operate and use the various types of survival equipment in suitably simulated situationsa.3. Participate in abandon vessel musters and drillsa.4. Communicate effectively with others as required when operating survival craft and ancillary survival equipment
2. Interdependent assessment of units	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of an officer or integrated rating.</p>
3. Required knowledge and skills	<ul style="list-style-type: none">a. Knowledge of relevant maritime regulationsb. ISM Code safety management system plans, procedures, checklists and instructions (where applicable)c. Relevant OH&S legislation and policiesd. SOLAS regulationse. Procedures and sequences of action for (1) launching, (2) carrying out pre-start engine checks and (3) operating survival craft and rescue boats in a variety of sea and weather conditionsf. Construction, outfit and particular characteristics of various types of life boats, life rafts and rescue boatsg. Typical manoeuvring and engine characteristics for survival craft including handling strategies to overcome hazards caused by a head sea, a following sea and a beam seah. Ways of maximising detectability and location of survival craft using pyrotechnic distress signals, portable VHF radios, Satellite EPIRBs and SARTsi. Procedures for correctly operating and using lifesaving appliances and personal safety equipment on board vessels and survival craft and specifically<ul style="list-style-type: none">i.1. donning a life jacket and using a life jacket light and whistlei.2. donning an immersions suiti.3. deployment of a mob combination light and smoke floati.4. use of hand-held pyrotechnicsj. Initial actions for survival on abandonment of vessel as summarised in maritime survival publications such as the AMSA publication 'Survival at Sea – a Training and Instruction Manual'k. Emergency muster and abandon vessel signalsl. Incidents that may result in an emergency on board vessel and the appropriate response in each casem. Threats to survival on abandonment of a vessel and appropriate strategies for countering these threatsn. Procedures for emergency response on board vessels including abandoning vesselo. Threats to survival on abandonment of a vessel and appropriate strategies for countering these threatsp. Procedures for the rationing of food and water in survival craftq. Symptoms of hypothermia, its prevention and treatment and the related use of protective covers and garments such as immersion suits and thermal protective aidsr. IMO safety symbols

Evidence Guide (continued)

OPERATE LIFE-SAVING APPLIANCES

<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to launch and operate survival craft and equipment, and/or a.2. organise and conduct abandon vessel musters and drills in appropriately simulations of maritime conditions a.3. assist in the launch and operate survival craft and equipment during emergency response simulations and drills on board an operational commercial or training vessel <p><i>Note:</i> Simulated first aid situations and assessments may require access to open and enclosed life boat fittings and equipment, on-load release gear training aid, open life boat and davit, life boat and rescue boat equipment, life jackets and hard hats, davit launched life raft and davit, inflatable throw over life raft, cradle and hydrostatic release, life boat/life raft boarding ladders, foul weather gear, training pool with jumping platform or equivalent, immersion suits, a selection of shipboard life saving, alerting and detection equipment typically found on vessels.</p> <p>Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian standards. At least one assessor must hold a current life saving qualification appropriate for in-water training and assessment exercises</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 participating in simulated emergency response musters and drills a.2 launching and operating survival craft and ancillary survival equipment a.3 applying safety precautions relevant to survival operations a.4 assessing operational capability of survival craft and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated ship's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 accepted survival procedures and maritime survival practice b.5 relevant manufacturer's guidelines relating to the operation and use of survival craft and equipment, including instructions on equipment capability and limitations c. Action taken promptly to report and/or rectify problems in the launching and operation of survival craft and equipment in accordance with established procedures d. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	2	2	1	1	2

TDM MF20 01A PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to prevent, control and fight fires on board a commercial vessel, including management of fire prevention measures, initiation and management of evacuation, emergency shutdown and isolation procedures, and the execution and coordination of fire-fighting operations for the type and size of vessel involved. The unit includes skills and knowledge to fight fires involving oil systems.

The unit is consistent with the related functional standard in Sections A II/2 and III/1 of the STCW Code, AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage fire prevention procedures</p>	<ul style="list-style-type: none"> a. Fire hazards on board a vessel are identified and action is taken to eliminate or minimise them b. Fire prevention equipment and systems are regularly checked and appropriate action is taken to ensure that they are operational c. Appropriate educational activities are organised to ensure on-board personnel are aware of the dangers of fire, how to prevent it and what to do if a fire is detected d. Personnel on board a vessel are made aware of emergency procedures to be followed in the event of fire
<p>2. Operate portable fire-fighting equipment</p>	<ul style="list-style-type: none"> a. A, B and C classes of fires are correctly identified in accordance with accepted fire-fighting practice b. Correct portable fire-fighting equipment is selected and used to fight specific classes of fires c. Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice d. Correct techniques are applied for the use of hose lines to extinguish fires on board a vessel e. Correct techniques are applied for the setting up of foam making equipment to extinguish B Class fires on board vessel f. Where applicable, correct techniques are used to recharge the various types of portable fire extinguisher g. Where applicable, portable fire-fighting equipment is confirmed as operational following recharging
<p>3. Conduct interior search and rescue and fire-fighting operations (where applicable.)</p>	<ul style="list-style-type: none"> a. Procedures for donning and starting up SCBA are correctly applied b. Procedures for the logging of SCBA operators on a BA Control Board is correctly followed in accordance with vessel's procedures and accepted fire-fighting practice c. Search and rescue operations in a smoke filled environment are correctly conducted as a member of a fire-fighting team in accordance with accepted fire-fighting practice d. Interior fires are extinguished using appropriate fire fighting equipment and procedures as a member of a fire-fighting team in accordance with accepted fire-fighting practice e. Lifeline signals are correctly used during interior fire-fighting operations f. A compartment filled with high expansion foam is correctly entered as per accepted fire-fighting practice

Range Of Variables

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed as a member of a team under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of accepted principles and practice to the prevention and fighting of fire on board vessel. Participation as a member of a fire-fighting team is involved. c. Work requires significant judgement and teamwork in the execution of measures and procedures for the prevention and fighting of fires that may occur on vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Fires on board vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of fires which may occur on board vessel include Classes A, B, C and F in the standard classification of fires d. Fire detection and fire-fighting systems applicable will depend on the type of vessel concerned and may include: <ul style="list-style-type: none"> d.1. fire detection devices and systems d.2. portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam d.3. fire blankets d.4. CO₂ fixed systems d.5. foam installations including semi-portable and fixed systems d.6. sprinkler systems d.7. fire pumps – main and emergency fire pump d.8. fire hoses, hydrants, branches and international shore connection e. Consumable materials and items that may used in fire detection and fire fighting equipment may include: <ul style="list-style-type: none"> e.1. Dry and wet chemicals used in fire extinguishers e.2. Batteries for fire detectors
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. vessel's log a.3. fire-detection, fire- fighting and safety equipment operational and maintenance instructions and recommended procedures a.4. instructions of relevant Maritime Authorities related to the maintenance and serviceability of vessel-board fire-detection, fire- fighting and safety equipment and systems a.5. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of Australian USL Code and AMSA Marine Orders a.3. Australian and international regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage and implement fire prevention measures and procedures on board a vessel a.2. Assess the operational capability of fire-detection and fire-fighting equipment and systems and initiate any required maintenance or replenishment action a.3. Use and recharge the various types of portable fire extinguishers typically used on board a vessel a.4. Participate in interior search and rescue and fire-fighting teams (where applicable) a.5. Implement OHS principles and policies when carrying out fire prevention and fire-fighting duties a.6. Communicate effectively with others as required during fire prevention activities and fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of marine officers with a responsibility to prevent, control and fight fires onboard a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. The chemistry of fire and its relationship to materials typically carried on vessels c. Principles underlying the spread of fire and its extinguishment d. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment e. Types of fire-detection, fire-fighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance f. Fire-fighting techniques applicable to different classes of fire on board a vessel g. Relevant regulations, codes of practice, policies and procedures related to the to the maintenance of fire-detection, fire-fighting equipment and systems h. Methods for checking and replacing consumable materials in typical fire-detection and fire-fighting equipment and systems on board various types and sizes of vessels i. Role and function of standard fire-fighting organisation models used on board vessels j. Maritime communication techniques applicable to fire prevention and fire-fighting activities on board a vessel k. Problems that can occur with fire-detection and fire-fighting equipment and operations on board a vessel and appropriate reporting and remedial action and solutions l. Sources of information on fire prevention and extinguishment on board vessels
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire prevention strategies and participate in interior search and rescue and fire-fighting teams on board vessels, and/or b. assist in fire prevention management procedures and fire-fighting drills on board an operational vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards.</p>

Evidence Guide (continued)

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 managing the implementation of fire prevention measures and procedures a.2 identifying and evaluating fire fighting problems and determining appropriate courses of action a.3 participating as a member of an interior search and rescue and fire-fighting team on board vessel a.4 assessing the operational capability of fire-detection and fire- fighting equipment and systems and taking any required maintenance or replenishment action <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of fire-detection and fire- fighting equipment and systems, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes and fire-hazard prevention measures b.6 fire prevention procedures and policies <p>c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection and fire- fighting, equipment and systems</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	1	3	3

TDM MF22 01A MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OF UNLIMITED PROPULSION POWER

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to ensure the safe and efficient operation and condition of the machinery installation on a vessel powered by main propulsion machinery of unlimited propulsion power within the scope of responsibility of a Marine Engineer (Class 1). This includes management of the maintenance of the safety of engine equipment, systems and related services.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Ensure application of safe operational and maintenance procedures and precautions</p>	<ul style="list-style-type: none"> a. The management of the operation and maintenance of the shipboard machinery installation is carried out in accordance with the responsibilities of an Engineer (Class 1) b. Precautions are taken prior to start up and operation of shipboard machinery and equipment to minimise and control hazards and operational risks in accordance with ship and company safe working procedures, manufacturers' specifications and instructions, and established engineering practice c. Safe watchkeeping procedures are carried out in accordance with ship's classification requirements, company procedures and regulatory requirements including all checks and maintenance requirements on the shipboard machinery installation d. Identified and potential operational problems with machinery are identified and investigated with the responsibilities of an Engineer (Class 1) e. Appropriate action is initiated to rectify any identified operational problems with due regard to potential hazards to personal safety of crew, passengers and others on the ship
<p>2. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Safe watchkeeping procedures, safety, hazard minimisation and pollution control procedures are developed and implemented with national and international regulations and company working procedures b. Operational hazards in the operation of shipboard machinery are identified and action is taken to minimise or eliminate risk to personnel, ship and the environment c. Relevant national and international regulations are followed at all times during machinery operations and maintenance d. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed e. Action is taken in the event of a machinery failure or emergency to secure the machinery and the ship and ensure the safety of the ship and persons involved f. Shipboard emergency and contingency plans followed in the event of a machinery failure or emergency during start up or shut down of main propulsion and auxiliary machinery
<p>3. Document safety related information</p>	<ul style="list-style-type: none"> a. Records of safety checks and precautions are entered and filed in accordance with ship, class and regulatory requirements b. Safety incidents are investigated and reported in accordance with regulatory requirements and ship and company procedures

Range Of Variables

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the scope of responsibility of an Engineer (Class1). c. Work involves the application of national and international regulations, company safety policies and procedures and established safe engineering practice to ensure the safety of engine equipment, systems and services on a ship of unlimited propulsion power. Contribution to the development and implementation of safe working procedures, operation plans and hazard control strategies is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in making arrangements for the safe and efficient operation and condition of the shipboard machinery installation within the scope of responsibility of an Engineer (Class1). This includes management and control of personnel, analysis of operational hazards and safe working requirements and the checking of the condition of shipboard machinery and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The machinery installation may include those typically found on an Australian or international commercial vessel of 3,000 kW propulsion power and more b. The safe and efficient operation and condition of the shipboard machinery installation must be maintained at all times including: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. during berthing and unberthing operations b.4. while anchored or moored b.5. in dry dock b.6. when bunkering b.7. during cargo operations c. Types of machinery encompasses all main, auxiliary and ancillary machinery and may include:: <ul style="list-style-type: none"> c.1. steam turbines, diesel, diesel electric and gas turbine propulsion systems and controls c.2. steering gear, stabilizers, bow thrusters, rudders c.3. fluid power systems and controls c.4. deck machinery c.5. pumps and pumping systems c.6. auxiliary systems and controls, including <ul style="list-style-type: none"> c.6.1. fresh and salt water cooling systems c.6.2. lubricating oil cooling systems c.6.3. fuel, oil, gas, coal c.6.4. air starting c.6.5. lubrication c.6.6. bilge and ballast system, oily water separator c.6.7. refrigeration and air-conditioning plant and equipment c.6.8. onboard air compressors and compressed air and control air systems c.6.9. waste management and pollution control systems as per the MARPOL Convention c.6.10. evaporators c.6.11. inert gas generator c.6.12. cargo pumps, tank washing machines and associated systems c.6.13. purifiers and clarifiers c.6.14. heaters c.6.15. sewage plant c.6.16. fixed fire fighting installations and fire control systems c.6.17. main and auxiliary boilers and waste heat generators c.6.18. life saving appliances c.6.19. maintenance to hull and vessel side valves c.6.20. anchoring and mooring equipment c.6.21. maintenance of plant associated with the carriage of dangerous goods

Range Of Variables (continued)

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>d. Propulsion plant configurations may include:</p> <ul style="list-style-type: none"> d.1. low speed, medium and high speed diesel propulsion d.2. stern tube bearing d.3. CPP d.4. direct drive shaft d.5. diesel electric d.6. steam turbine d.7. gas turbine d.8. reduction gears d.9. thrust blocks, detuners and shaft bearings <p>e. Types of electrical and electronic control equipment may include::</p> <ul style="list-style-type: none"> e.1. programmable logic controllers (PLCs) e.2. signal transmission systems used for monitoring and control e.3. temperature and pressure sensors e.4. electronic PID controllers e.5. analog to digital converters e.6. electrical and electronic equipment space monitoring alarm and control systems e.7. a.c. generators e.8. a.c. and d.c. motors, including: <ul style="list-style-type: none"> e.8.1. three phase induction motors such as squirrel cage, double cage, wound rotor and slip ring, TEFC, splash proof and submersible e.8.2. three phase synchronous motors e.9. three phase alternators e.10. three phase transformers e.11. electronic instrumentation and power supply circuits e.12. main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> e.12.1. distribution circuits and wiring e.12.2. protection devices e.12.3. circuit breakers e.13. emergency supply systems including emergency generators and battery banks e.14. electronic governors e.15. deck electrical machinery <p>f. Operational hazards may include but are not restricted to:</p> <ul style="list-style-type: none"> f.1. moving heavy loads in an unsafe work environment f.2. unsecured machinery, components or repaired equipment f.3. slippery deck f.4. welding equipment f.5. sharp tools and implements f.6. power tools f.7. moving and rotating machinery f.8. flammable liquids, vapours and fuel f.9. faulty machinery equipment handling equipment and lifting gear f.10. using equipment beyond safe working limits f.11. poor housekeeping procedures f.12. non-compliance with safe working procedures f.13. electrical wiring and systems f.14. hot pipes and valves (steam, fuel oil, lubricating oil) f.15. cold pipes and valves (refrigeration and liquefied gas cargoes) f.16. working at heights f.17. exposed electrical circuits f.18. toxic gases and substances f.19. chemicals and other harmful substances f.20. damaged cargo and containers f.21. noxious and dangerous cargoes f.22. overspeed of electrical machinery, emergency trips

<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's safety management policies, emergency contingency plans and procedures a.3. identifying records required under OHS legislation, for example: <ul style="list-style-type: none"> a.3.1. worker's compensation and rehabilitation records a.3.2. hazardous substances registers a.3.3. Material Safety Data Sheets a.3.4. major accident/injury notifications and a.3.5. certificates and licences a.4. manufacturers and suppliers operating and maintenance instructions and OHS information a.5. OHS audits and inspection reports a.6. maintenance and testing reports a.7. workplace environmental monitoring and health surveillance records a.8. records of instruction and training and a.9. first aid/medical post records.
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with OHS in shipboard workplaces a.2. relevant international, Australian and State/Territory OH&S legislation, particularly: <ul style="list-style-type: none"> a.2.1. OHS Acts, regulations and codes of practice, including regulations and codes of practice relating to hazards present in the workplace or industry; a.2.2. general duty of care under OHS legislation and common law; a.2.3. requirements for the maintenance and confidentiality of records of occupational injury and disease; a.2.4. requirements for provision of OHS information and training; a.2.5. provisions relating to health and safety representatives and/or OHS committees; and a.2.6. provisions relating to OHS issue resolution.

Evidence Guide

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Ensure the safety of engine equipment, systems and services onboard a vessel a.2. Ensure the safe and efficient operation and condition of shipboard machinery installation a.3. Identify safety related problems and hazards associated with the operation of the shipboard machinery installation and initiate appropriate action for the minimisation or elimination a.4. Ensuring that personnel exercise all required safety, environmental and hazard control precautions and procedures when operating the shipboard machinery installation a.5. Communicate effectively with others when operating the shipboard machinery installation, including use of the internal communication system a.6. Ensure adherence to national and international safety regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the start up and shut down of main propulsion and auxiliary machinery and associated systems on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for ensuring the safe and efficient operation and condition of shipboard machinery installations d. Operational characteristics and performance specifications for the different types of machinery installation usually found on a vessel of unlimited propulsion power e. Procedures for checking the various parts of the shipboard machinery installation to ensure compliance with the company and survey requirements and established safety rules and regulations f. The nature and causes of typical start up and shut down malfunctions of main propulsion and auxiliary machinery and associated systems and the available methods for their detection and rectification g. Safety, environmental and hazard control precautions and procedures relevant to the operation of shipboard machinery installation h. Hazards and associated safety risks associated with the operation of the machinery installation on the vessel, including: <ul style="list-style-type: none"> h.1. the range of control measures available for these safety risks h.2. considerations for choosing between different control measures h.3. how to identify when expert advice is needed i. Types of operational records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities j. Maritime communication techniques needed during the start up and shut down of main propulsion and auxiliary machinery and associated systems k. Knowledge and ability to read and interpret material safety data sheets l. Knowledge and ability to read and interpret machinery performance readings and indications m. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams n. Safety issues, hazards and precautions associated with the operation of: <ul style="list-style-type: none"> n.1. engines and propulsion plant n.2. fuel systems n.3. engine cooling and lubrication systems n.4. electrical plant and distribution systems n.5. marine control systems n.6. auxiliary machinery and associated systems o. A basic understanding of the properties, characteristics and application of materials and structures typically used in the construction of a vessel of unlimited propulsion power and its associated operational machinery and a basic knowledge of the properties and characteristics of liquids, fuels, lubricants, gases and vapours used onboard vessel

Evidence Guide (continued)

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OF UNLIMITED PROPULSION POWER

3. Required knowledge and skills (continued)
- p. Procedures for the testing of boiler water, machinery cooling water and lubricating oil
 - q. Principles and operational characteristics of power transmission systems including gearing, chain, hydraulic and belt
 - r. Principles and operational characteristics of internal combustion engines, including:
 - r.1. two stroke and four stroke cycles
 - r.2. optimum combustion parameters and their control
 - r.3. diesel engine scavenging systems both in normal and emergency operation
 - r.4. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised
 - s. Principles of fuel systems, including:
 - s.1. typical injection pressures and viscosities for different grades of fuel
 - s.2. alterations to fuel pumps, camshafts and injectors for varying fuel types
 - s.3. differences between constant and variable injection timing of fuel
 - s.4. injection requirements for different speeds of diesel engine
 - s.5. common service faults, symptoms and causes of combustion problems and related solutions
 - s.6. fuel line pulsation damping devices and leakage protection
 - s.7. fuel valve cooling arrangements
 - s.8. uni-fuel and dual fuel systems
 - t. Principles of engine cooling and lubrication, including:
 - t.1. different methods of diesel engine cooling
 - t.2. need for treatment of engine cooling water
 - t.3. methods of treating engine cooling water
 - t.4. diesel engine lubrication requirements
 - t.5. methods of lubricating diesel engine components
 - t.6. theory and types of lubrication
 - t.7. relative characteristics, and applications of mineral and synthetic oils
 - t.8. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - t.9. common lubrication problems and their solution
 - u. Principles of operation of hydraulic and electronic overspeed governors
 - v. Principles of marine control systems, including
 - v.1. common sensors and their associated transmitters
 - v.2. analysis of control loops
 - v.3. temperature and pressure control systems used onboard vessel
 - v.4. methods of load-dependent cooling of diesel alternators on heavy fuel oils
 - v.5. analysis of typical level control systems used onboard vessel
 - v.6. operation and application of electronic PID controllers
 - w. Principles and functions of machinery space monitoring and alarm systems, including:
 - w.1. central cooling and load dependent cooling control systems
 - w.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control
 - w.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis
 - x. Theory and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including:
 - x.1. plans for hazard reduction
 - x.2. procedures for extinguishment of scavenge fires
 - x.3. regaining of control after starting airline, crankcase and gearbox explosions
 - y. Methods of providing air for combustion
 - z. Principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:
 - z.1. heat transfer, including log mean temperature and circular pressure vessels
 - z.2. gases
 - z.3. gas cycles
 - z.4. properties and expansion of steam
 - z.5. steam cycles including a specific understanding of the use of entropy charts and modifications to the steam cycle
 - z.6. boilers and evaporators
 - z.7. steam turbines, including an understanding of isentropic efficiency
 - z.8. combustion with a specific understanding of volumetric analysis
 - z.9. refrigeration and air conditioning, including the use of entropy charts.

Evidence Guide (continued)

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OF UNLIMITED PROPULSION POWER

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to ensure the application of hazard control measures and safe working regulations and procedures to ensure the safety of engine equipment, systems and services on a vessel of unlimited propulsion power; and/or b. The application of hazard control measures and safe working regulations and procedures to the efficient operation of the machinery installation on a commercial or training vessel of unlimited propulsion power
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. ensuring the safety of engine equipment, systems and services onboard a vessel a.2. ensuring the application of hazard control measures and safe working regulations and procedures to the efficient operation of the machinery installation a.3. identifying problems and hazards and initiating appropriate action for rectification a.4. communicating effectively with others during operations on the shipboard machinery installation a.5. identifying and implementing safety related improvements to operational procedures a.6. completing safety related documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. issue resolution procedures b.4. ISM Code safety management system procedures and work instructions on the operation of the shipboard equipment installation typically found on a vessel of unlimited propulsion power, including machinery specifications and directions on equipment capability, safety hazards and precautions, and operational limitations b.5. machinery security procedures b.6. following on-board housekeeping processes c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Recognises and adapts appropriately to cultural differences on board vessel in behaviour and interactions among officers, crew and passengers, where relevant e. Work is managed, controlled and completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF24 01A MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OVER 750 KW PROPULSION POWER

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to ensuring the safe and efficient operation and condition of the machinery installation within the limits of responsibility of a Marine Engineer (Class 2) on a vessel powered by main propulsion machinery of 750 kW propulsion power or above.

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Ensure application of safe operational and maintenance procedures and precautions</p>	<p>a. The operation and maintenance of the shipboard machinery installation is carried out in accordance with the responsibilities of an Engineer (Class 2)</p> <p>b. Precautions are taken prior to start up and operation of shipboard machinery and equipment to minimise and control hazards and operational risks in accordance with safe working procedures, manufacturers' instructions and established engineering practice</p> <p>c. Safe watchkeeping procedures are carried out in accordance with vessel's survey requirements, company procedures and regulatory requirements including all checks and maintenance requirements on the shipboard machinery installation</p> <p>d. Identified and potential operational problems with machinery are identified and investigated with the responsibilities of an Engineer (Class 2)</p> <p>e. Appropriate action is initiated to rectify any identified operational problems with due regard to potential hazards to personal safety of crew, passengers and others on the vessel</p>
<p>2. Follow safety and hazard control procedures</p>	<p>a. Safe watchkeeping procedures, safety, hazard minimisation and pollution control procedures are developed and implemented with national and international regulations and company working procedures</p> <p>b. Operational hazards in the operation of shipboard machinery are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment</p> <p>c. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed</p> <p>d. Action is taken in the event of a machinery failure or emergency to secure the machinery and the vessel and ensure the safety of the vessel and persons involved</p> <p>e. Shipboard emergency and contingency plans followed in the event of a machinery failure or emergency during start up or shut down of main propulsion and auxiliary machinery</p>
<p>3. Document safety related information</p>	<p>a. Records of safety checks and precautions are entered and filed in accordance with vessel, class and regulatory requirements</p> <p>b. Safety incidents are investigated and reported in accordance with regulatory requirements and vessel and company procedures</p>

Range Of Variables

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of national and international regulations, company safety policies and procedures and established safe engineering practice to ensure the safety of engine equipment, systems and services on vessels of 750 kW propulsion power and more. Contribution to the development and implementation of safe working procedures, operation plans and hazard control strategies is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in making arrangements for the safe and efficient operation and condition of the shipboard machinery installation within the limits of responsibility of an Engineer (Class 2). This includes management and control of personnel, analysis of operational hazards and safe working requirements and the checking of the condition of shipboard machinery and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The machinery installation may include those typically found on Australian or international commercial vessel of 750 kW propulsion power and more b. The safe and efficient operation and condition of the shipboard machinery installation must be maintained at all times including: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. during berthing and unberthing operations b.4. while anchored or moored b.5. in dry dock b.6. when bunkering b.7. during cargo operations c. Types of machinery encompasses all main, auxiliary and ancillary machinery and may include:: <ul style="list-style-type: none"> c.1. steam turbines, diesel, diesel electric and gas turbine propulsion systems and controls c.2. steering gear, stabilizers, bow thrusters, rudders c.3. fluid power systems and controls c.4. deck machinery c.5. pumps and pumping systems c.6. auxiliary systems and controls, including <ul style="list-style-type: none"> c.6.1. fresh and salt water cooling systems c.6.2. lubricating oil cooling systems c.6.3. fuel, oil, gas, coal systems and centrifuges c.6.4. compressed air and air starting systems c.6.5. lubrication c.6.6. bilge and ballast system, oily water separator c.6.7. refrigeration and air-conditioning plant and equipment c.6.8. onboard air compressors and compressed air and control air systems c.6.9. waste management and pollution control systems as per the MARPOL Convention c.6.10. evaporators c.6.11. inert gas generator c.6.12. cargo pumps, tank washing machines and associated systems c.6.13. purifiers and clarifiers c.6.14. heaters c.6.15. sewage plant c.6.16. fixed fire fighting installations and fire control systems c.6.17. main and auxiliary boilers and waste heat generators c.6.18. life saving appliances c.6.19. maintenance to hull and vessel side valves c.6.20. anchoring and mooring equipment c.6.21. plant associated with the carriage of dangerous goods

Range Of Variables (continued)

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>d. Propulsion plant configurations may include:</p> <ul style="list-style-type: none"> d.1. low speed, medium and high speed diesel propulsion d.2. stern tube bearing d.3. fixed pitch and CPP d.4. direct drive shaft d.5. diesel electric d.6. steam plant d.7. gas turbine d.8. reduction gears d.9. thrust blocks, detuners and shaft bearings <p>e. Types of electrical and electronic control equipment may include::</p> <ul style="list-style-type: none"> e.1. programmable logic controllers (PLCs) e.2. signal transmission systems used for monitoring and control e.3. temperature and pressure sensors e.4. electronic PID controllers e.5. analog to digital converters e.6. electrical and electronic equipment space monitoring alarm and control systems e.7. a.c. generators e.8. a.c. and d.c. motors, including: <ul style="list-style-type: none"> e.8.1. three phase induction motors such as squirrel cage, double cage, wound rotor and slip ring, TEFC, splash proof and submersible e.8.2. three phase synchronous motors e.9. three phase alternators e.10. three phase transformers e.11. electronic instrumentation and power supply circuits e.12. main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> e.12.1. distribution circuits and wiring e.12.2. protection devices e.12.3. circuit breakers e.13. emergency supply systems including emergency generators and battery banks e.14. electronic governors e.15. deck electrical machinery <p>f. Operational hazards may include but are not restricted to:</p> <ul style="list-style-type: none"> f.1. moving heavy loads using unsafe lifting procedures f.2. unsecured machinery, components or repaired equipment f.3. slippery deck f.4. welding equipment f.5. sharp tools and implements f.6. power tools f.7. moving and rotating machinery f.8. flammable liquids, vapours and fuel f.9. faulty machinery equipment handling equipment and lifting gear f.10. using equipment beyond safe working limits f.11. poor housekeeping procedures f.12. non-compliance with safe working procedures f.13. electrical wiring and systems f.14. hot pipes and valves (steam, fuel oil, lubricating oil) f.15. cold pipes and valves (refrigeration and liquefied gas cargoes) f.16. working at heights f.17. exposed electrical circuits f.18. toxic gases and substances f.19. chemicals and other harmful substances f.20. damaged cargo and containers f.21. noxious and dangerous cargoes f.22. overspeed of electrical machinery, emergency tips

Range Of Variables (continued)

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's safety management policies, emergency contingency plans and procedures a.3. identifying records required under OHS legislation, for example: <ul style="list-style-type: none"> a.3.1. worker's compensation and rehabilitation records a.3.2. hazardous substances registers a.3.3. Material Safety Data Sheets a.3.4. major accident/injury notifications and a.3.5. certificates and licences a.4. manufacturers and suppliers operating and maintenance instructions and OHS information a.5. OHS audits and inspection reports a.6. maintenance and testing reports a.7. workplace environmental monitoring and health surveillance records a.8. records of instruction and training and a.9. first aid/medical post records.
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with OHS in shipboard workplaces a.2. relevant international, Australian and State/Territory OH&S legislation, particularly: <ul style="list-style-type: none"> a.2.1. OHS Acts, regulations and codes of practice, including regulations and codes of practice relating to hazards present in the workplace or industry; a.2.2. general duty of care under OHS legislation and common law; a.2.3. requirements for the maintenance and confidentiality of records of occupational injury and disease; a.2.4. requirements for provision of OHS information and training; a.2.5. provisions relating to health and safety representatives and/or OHS committees; and a.2.6. provisions relating to OHS issue resolution.

Evidence Guide

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Ensure the safety of engine equipment, systems and services onboard a vessel in accordance with the scope of responsibility of an Engineer (Class 2) a.2. Ensure the safe and efficient operation and condition of shipboard machinery installation in accordance with the scope of responsibility of an Engineer (Class 2). a.3. Identify safety related problems and hazards associated with the operation of the shipboard machinery installation and initiate appropriate action for the minimisation or elimination a.4. Ensuring that personnel exercise all required safety, environmental and hazard control precautions and procedures when operating the shipboard machinery installation a.5. Communicate effectively with others when operating the shipboard machinery installation, including use of the internal communication system a.6. Ensure adherence to national and international safety regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the start up and shut down of main propulsion and auxiliary machinery and associated systems on vessels of 750 kW propulsion power and more b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for ensuring the safe and efficient operation and condition of shipboard machinery installations d. Operational characteristics and performance specifications and or more e. Procedures for checking the various parts of the shipboard machinery installation to ensure compliance with the company and survey requirements and established safety rules and regulations f. The nature and causes of typical start up and shut down malfunctions of main propulsion and auxiliary machinery and associated systems and the available methods for their detection and rectification g. Safety, environmental and hazard control precautions and procedures relevant to the operation of shipboard machinery installation h. Hazards and associated safety risks associated with the operation of the machinery installation on the vessel, including: <ul style="list-style-type: none"> h.1. the range of control measures available for these safety risks h.2. considerations for choosing between different control measures h.3. how to identify when expert advice is needed i. Operational records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities j. Maritime communication techniques needed during the start up and shut down of main propulsion and auxiliary machinery and associated systems k. Knowledge and ability to read and interpret material safety data sheets l. Knowledge and ability to read and interpret machinery performance readings and indications m. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams n. Safety issues, hazards and precautions associated with the operation of: <ul style="list-style-type: none"> n.1. engines and propulsion plant n.2. fuel systems n.3. engine cooling and lubrication systems n.4. electrical plant and distribution systems n.5. marine control systems n.6. auxiliary machinery and associated systems o. A basic understanding of the properties, characteristics and application of materials and structures typically used in the construction of a vessel of 750 kW propulsion power or more and its associated operational machinery and a basic knowledge of the properties and characteristics of liquids, fuels, lubricants, gases and vapours used onboard vessel

Evidence Guide (continued)

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OVER 750 KW PROPULSION POWER

3. Required knowledge and skills (continued)
- p. Procedures for the testing of boiler water, machinery cooling water and lubricating oil
 - q. Principles and operational characteristics of power transmission systems including gearing, chain, hydraulic and belt
 - r. Basic principles and operational characteristics of internal combustion engines, including:
 - r.1. two stroke and four stroke cycles
 - r.2. optimum combustion parameters and their control
 - r.3. diesel engine scavenging systems both in normal and emergency operation
 - r.4. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised
 - s. Basic principles of fuel systems, including:
 - s.1. typical injection pressures and viscosities for different grades of fuel
 - s.2. alterations to fuel pumps, camshafts and injectors for varying fuel types
 - s.3. differences between constant and variable injection timing of fuel
 - s.4. injection requirements for different speeds of diesel engine
 - s.5. common service faults, symptoms and causes of combustion problems and related solutions
 - s.6. fuel line pulsation damping devices and leakage protection
 - s.7. fuel valve cooling arrangements
 - s.8. uni-fuel and dual fuel systems
 - t. Basic principles of engine cooling and lubrication, including:
 - t.1. different methods of diesel engine cooling
 - t.2. need for treatment of engine cooling water
 - t.3. methods of treating engine cooling water
 - t.4. diesel engine lubrication requirements
 - t.5. methods of lubricating diesel engine components
 - t.6. theory and types of lubrication
 - t.7. relative characteristics, and applications of mineral and synthetic oils
 - t.8. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - t.9. common lubrication problems and their solution
 - u. Principles of operation of hydraulic and electronic overspeed governors
 - v. Basic principles of marine control systems, including
 - v.1. common sensors and their associated transmitters
 - v.2. analysis of control loops
 - v.3. temperature and pressure control systems used onboard vessel
 - v.4. methods of load-dependent cooling of diesel alternators on heavy fuel oils
 - v.5. analysis of typical level control systems used onboard vessel
 - v.6. basic principles of electronic PID controllers
 - w. Basic principles and functions of machinery space monitoring and alarm systems including:
 - w.1. central cooling and load dependent cooling control systems
 - w.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control
 - w.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis
 - x. Principles and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including:
 - x.1. plans for hazard reduction
 - x.2. procedures for extinguishment of scavenge fires
 - x.3. regaining of control after starting airline, crankcase and gearbox explosions
 - y. Methods of providing air for combustion
 - z. Basic principles of thermodynamics and heat and heat engines, including:
 - z.1. heat transfer
 - z.2. gases
 - z.3. gas cycles
 - z.4. combustion
 - z.5. properties and expansion of steam
 - z.6. steam cycles
 - z.7. boilers and evaporators
 - z.8. steam turbines
 - z.9. gas turbines
 - z.10. refrigeration and air conditioning

Evidence Guide (continued)

MAINTAIN SAFETY OF ENGINE EQUIPMENT, SYSTEMS AND SERVICES ON VESSELS OVER 750 KW PROPULSION POWER

4. Resource implications	<p>Access is required to opportunities to either</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to ensure the application of hazard control measures and safe working regulations and procedures to ensure the safety of engine equipment, systems and services on a vessels of 750 kW propulsion power and more; and/or b. The application of hazard control measures and safe working regulations and procedures to the efficient operation of the machinery installation on a commercial or training vessel of 750 kW propulsion power or more
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. ensuring the safety of engine equipment, systems and services onboard a vessel a.2. ensuring the application of hazard control measures and safe working regulations and procedures to the efficient operation of the machinery installation a.3. identifying problems and hazards and initiating appropriate action for rectification a.4. communicating effectively with others during operations on the shipboard machinery installation a.5. identifying and implementing safety related improvements to operational procedures a.6. completing safety related documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on the operation of the shipboard equipment installation typically found on a vessel, including machinery specifications and directions on equipment capability, safety hazards and precautions, and operational limitations b.4. machinery security procedures b.5. following on-board housekeeping processes c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF26 01A ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to establish and maintain bridge and engine room watchkeeping arrangements in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of a commercial vessel and persons on board.

The unit is consistent with the related functional standard in Sections A II/2 and AIII/2 of the STCW 95 Code and Appendix 2 and Appendix 3 of Marine Orders Part 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Establish bridge/engine room working systems and procedures</p>	<ul style="list-style-type: none"> a. Watchkeeping arrangements and procedures are established as required by AMSA Marine Orders and company procedures taking into account relevant factors b. The principles of Bridge Resource Management (BRM) are appropriately applied in the establishment of watchkeeping arrangements and procedures and the development of an effective Bridge Working System c. Composition of the watch is determined in accordance with the principles set out in AMSA Marine Orders d. Bridge/engine room working systems is documented as required and communicated to bridge personnel
<p>2. Manage the bridge/engine room teams</p>	<ul style="list-style-type: none"> a. The current competence of personnel is evaluated and appropriate measures are taken to ensure all personnel have the required level of competence b. Personnel are assigned in accordance with their assessed level of current competence and experience and established bridge watchkeeping requirements c. Watchkeeping arrangements and procedures are explained to assigned watch officers and other bridge personnel and their duties and responsibilities confirmed d. Fatigue management strategies are applied within the bridge/engine room management team e. Watchkeeping operations are monitored and appropriate action is taken where they are found to be in breach of established arrangements, regulations and procedures

Range Of Variables

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations b. Work is performed independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental nautical principles and complex manoeuvring techniques across a wide and often unpredictable variety of operational contexts. Planning, establishment and maintenance of watchkeeping arrangements is required. Accountability and responsibility for self and others in achieving the required watchkeeping functions is involved. d. Work requires significant judgement in planning, organisational and leadership functions related to the establishment of watchkeeping arrangements and procedures for commercial vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of unlimited tonnage or propulsion power b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor b.8. when bunkering b.9. during cargo operations c. Watchkeeping includes both navigational and engine room watchkeeping duties d. Watchkeeping principles (as described in the AMSA Marine Orders Section 28, Appendix 3, Sections 3.3.4 and 3.4) include: <ul style="list-style-type: none"> d.1. proper lookout must be maintained at all times d.2. duties of look out and helmsman must be kept separate d.3. look-out must give full attention to keeping a proper look out and must not be given other duties which could interfere with the task d.4. all necessary precautions must be taken to avoid pollution of the marine environment d.5. assistance must be available to be summoned to the bridge if required by a change in the vessel's situation e. Fatigue management strategies may include: <ul style="list-style-type: none"> e.1. recognition of symptoms of fatigue e.2. arranging to take a break when symptoms of fatigue are identified e.3. maintenance of personal fitness and health e.4. appropriate dietary habits e.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties f. Factors to be taken into account when establishing watchkeeping arrangements include: <ul style="list-style-type: none"> f.1. bridge must never be left unattended f.2. weather and sea conditions, visibility and whether there is daylight or darkness f.3. proximity of navigational hazards f.4. use and operational condition of navigational aids f.5. the operational status of bridge instrumentation, controls and alarms f.6. whether the vessel is fitted with an automatic steering system f.7. whether there are radio duties to be performed f.8. provision of unmanned machinery space (UMS) controls, alarms and indicators f.9. unusual demands on the watch arising from operational conditions f.10. traffic density and other activities occurring in the area in which the vessel is navigating f.11. the size of the vessel and the field of vision available from the conning position f.12. the attention necessary when navigating in or near traffic separation schemes or other routing measures f.13. the professional competence and experience of the vessel's officers and crew and their familiarity with the vessel's equipment, procedures, and manoeuvring capability f.14. the fitness for duty of any crew members on call who are assigned as members of the watch f.15. rudder and propeller control and vessel manoeuvring characteristics f.16. the additional workload caused by the nature of the vessel's functions, immediate operating requirements and anticipated manoeuvres

Range Of Variables (continued)

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

VARIABLE	SCOPE
2. Worksite environment (continued)	g. Available navigational aids may include: g.1. radar g.2. electronic position-indicating devices g.3. other equipment affecting the safe navigation of the vessel
3. Sources of information / documents	a. Documentation / records may include a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW 95 Code and Convention a.5. AMSA Marine Orders a.6. ICS Bridge Procedures Guide a.7. vessel's log a.8. company procedures a.9. instructions of relevant Maritime Authorities a.10. pilot instructions where relevant a.11. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. Relevant sections of the IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. ISM Code a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Establish watch keeping arrangements and procedures a.2. Assign watchkeeping responsibilities a.3. Assess current competence of bridge personnel in terms of their watchkeeping roles and responsibilities a.4. Monitor watchkeeping procedures a.5. Communicate effectively with others concerning watchkeeping arrangements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master or chief engineer of a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of IMO STCW Convention and Codes and AMSA Marine Orders dealing with watchkeeping principles, arrangements, procedures, roles and responsibilities b. Relevant OH&S legislation and policies c. Bridge Resource Management systems d. Implications of a range of factors that can affect watchkeeping functions and the composition of the bridge engine room management team e. Causes of groundings, collisions and casualties when on board a vessel f. Navigational hazards and implications for watchkeeping g. Operating procedures for typical navigational aids and skills and knowledge needed to use them effectively h. Watch handover procedures i. Bridge instrumentation, controls and alarms j. Functions of unmanned machinery space (UMS) controls, alarms and indicators k. Ways of assessing the current competence of the vessel's officers and crew and their familiarity with the vessel's equipment, procedures, and manoeuvring capability l. Rudder and propeller control and vessel manoeuvring characteristics m. Precautions necessary when navigating in or near traffic separation schemes or other routing measures n. Signs of fatigue o. Fatigue management principles and techniques p. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate the ability to establish and manage watchkeeping arrangements through a range of case studies, exercises and assignments that suitably-simulate a range of watchkeeping situations for a vessel of 500 gross tonnage or more; and/or b. establish and manage the watchkeeping arrangements on an operational commercial vessel of 500 gross tonnage or more in an appropriate range of situations, weather and loading conditions

Evidence Guide (continued)

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 establishing and monitoring watchkeeping arrangements a.2 identifying and evaluating bridge management problems and determining an appropriate courses of action a.3 identifying and implementing improvements to bridge management procedures a.4 applying safety precautions relevant to watchkeeping operations a.5 assessing competence and experience of vessel's officers and crew and their suitability for watchkeeping roles <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant guidelines relating to bridge management and watchkeeping arrangements on board a vessel b.6 security procedures b.7 following bridge housekeeping processes <p>c. Action taken promptly to report and/or rectify watchkeeping incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF27 00A PREVENT, CONTROL AND FIGHT FIRES ON BOARD A SMALL VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to prevent, control and fight fires on board a small commercial vessel, including management of fire prevention measures, initiation and management of evacuation, emergency shutdown and isolation procedures, and the execution and coordination of fire-fighting operations for the type and size of vessel involved.

The unit is consistent with the relevant sections in the Australian USL Code

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage fire prevention and control procedures</p>	<ul style="list-style-type: none"> a. Fire hazards on board a vessel are identified and action is taken to eliminate or minimise them b. Fire prevention equipment is regularly checked and appropriate action is taken to ensure that they are operational c. Appropriate educational activities are organised to ensure on-board personnel are aware of the dangers of fire, how to prevent it and what to do if a fire is detected d. Personnel on board the vessel are made aware of emergency procedures to be followed in the event of fire e. Fire control is implemented in accordance with marine safety and vessel operating procedures f. Action taken to control a fire is based on an accurate assessment of the incident g. The order of priority, timing and sequence of actions are appropriate to the overall requirements of the incident, and to minimise damage and potential damage to the vessel, injuries to personnel and impairment of the operational effectiveness of the vessel
<p>2. Operate and maintain portable fire-fighting equipment</p>	<ul style="list-style-type: none"> a. A, B and C classes of fires are correctly identified in accordance with accepted fire-fighting practice b. Appropriate fire-fighting equipment is selected and used to fight specific classes of fires c. Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice d. Correct techniques are applied for the use of hose lines to extinguish fires on board a vessel e. Fire fighting equipment is regularly checked and appropriate action is taken to ensure that it is operational

Range Of Variables

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian USL Code. b. Work is performed as a member of a team under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of accepted principles and practice to the prevention and fighting of fire on board a vessel. Participation as a member of a fire-fighting team is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small Australian or international commercial vessel b. Fires on board vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of fires which may occur on board vessel include Classes A, B, C and F in the standard classification of fires d. Fire detection and fire-fighting systems may include: <ul style="list-style-type: none"> d.1. Fire detection devices and systems d.2. Portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam (where applicable) d.3. Fire blankets d.4. Sprinkler systems d.5. Fire pumps – main and emergency fire pump d.6. Fire hoses, hydrants, branches and international shore connection e. Consumable materials and items that may used in fire detection and fire fighting equipment may include: <ul style="list-style-type: none"> e.1. Dry and wet chemicals used in fire extinguishers e.2. Batteries for fire detectors
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Australian USL Code and other legislative requirements a.2. vessel's log a.3. fire-detection, fire- fighting and safety equipment operational and maintenance instructions and recommended procedures a.4. instructions of relevant Maritime Authorities related to the maintenance and serviceability of vessel-board fire-detection, fire- fighting and safety equipment and systems a.5. relevant Australian standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of USL Code a.2. Australian regulations for the maintenance of fire-detection, fire- fighting and safety equipment and systems a.3. relevant Australian and State/Territory OH&S legislation

Evidence Guide

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage and implement fire prevention measures and procedures on board a small vessel a.2. Assess the operational capability of relevant fire-detection and fire- fighting equipment and initiate any required reporting or maintenance action a.3. Use the various types of fire fighting equipment used on board a small vessel a.4. Implement OHS principles and policies when carrying out fire prevention and fire-fighting duties a.5. Communicate effectively with others as required during fire prevention activities and fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of officers with a responsibility to prevent, control and fight fires onboard a small commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of the Australian USL Code b. The chemistry of fire and its relationship to materials typically carried on small vessels c. Principles underlying the spread of fire and its extinguishment d. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment e. Types of fire-detection, fire- fighting equipment and systems used on board small vessels, their features, principles of operation and the procedures for their use and maintenance f. Fire-fighting techniques applicable to different classes of fire on board a small vessel g. Relevant regulations and policies related to the to the maintenance of fire-detection and fire fighting equipment used on small vessels h. Fire-fighting procedures applicable to small vessels i. Maritime communication techniques applicable to fire prevention and fire-fighting activities on board a vessel j. Problems that can occur with fire-detection and fire- fighting equipment and operations on board a small vessel and appropriate remedial action and solutions k. Sources of information on fire prevention and extinguishment on board small vessels
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire prevention strategies and participate in search and rescue and fire-fighting teams on board small vessels, and/or b. assist in fire prevention management procedures and fire-fighting drills on board an operational small commercial vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards.</p>

Evidence Guide (continued)

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A SMALL VESSEL

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 managing the implementation of fire prevention and control measures and procedures on board a small vessel a.2 identifying and evaluating fire fighting problems and determining appropriate courses of action a.3 assessing the operational capability of fire-detection and fire-fighting equipment and systems and taking any required maintenance or replenishment action b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 fire prevention and control procedures and policies b.3 OHS regulations and hazard prevention policies and procedures b.4 relevant manufacturer's guidelines relating to the use of fire-detection and fire-fighting equipment and systems, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes and fire-hazard prevention measures c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection and fire-fighting, equipment and systems in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF31 01A MAINTAIN A SAFE ENGINEERING WATCH

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to maintain a safe engineering watch on a commercial vessel, including the correct conduct, hand over and relief of the engineering watch, correct internal communications, monitoring of the operation and performance of the main propulsion and auxiliary systems and associated controls, identification and rectification of engine room malfunctions, initiation of correct responses to engine room emergencies and maintenance of records of engineering watch activities and incidents

The unit is consistent with the related functional standard in Section A III/1 of the STCW 95 Code and Sections 1.3 of the AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Carry out engineering watchkeeping procedures</p>	<ul style="list-style-type: none"> a. The conduct, handover and relief of the engineering watch conforms with accepted principles and vessel's procedures b. Watchkeeping principles and procedures are maintained in accordance with established marine engineering practice and regulatory requirements c. Main propulsion and auxiliary systems and associated controls are operated in accordance with bridge commands and operational procedures and requirements d. The frequency and extent of monitoring of performance of main propulsion and auxiliary systems and associated controls conform with vessel's procedures and established engineering practice e. Problems in the performance of main propulsion and auxiliary systems and associated controls are promptly identified and appropriate action is initiated to correct the problems in accordance with established marine engineering practice f. A safe engineering watch is achieved through the implementation of accepted bridge and engine room resource management principles and procedures g. Fatigue management strategies are correctly applied within the engine room management team
<p>2. Respond to malfunctions and emergency situations</p>	<ul style="list-style-type: none"> a. Malfunctions of the main propulsion and auxiliary systems are identified, analysed and appropriate action is taken in ample time and in accordance with regulatory requirements b. Correct responses are made to engine room malfunctions, emergencies and situations that pose a danger to the vessel and personnel on board c. Emergency situations are recognised and emergency procedures are initiated in accordance with established engineering practice and company and regulatory requirements d. Chief engineer is called in the event of an engine room incident or emergency which falls outside the officer's limits of responsibility
<p>3. Maintain watchkeeping records</p>	<ul style="list-style-type: none"> a. A proper and accurate record is maintained of the activities and incidents that have occurred during the keeping of an engineering watch b. Appropriate entries pertaining to the engineering watch are recorded in the vessel's log

Range Of Variables

MAINTAIN A SAFE ENGINEERING WATCH

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently in consultation with a senior engineer, within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice to the keeping of a safe engineering watch on a vessel of unlimited propulsion power across a wide and often unpredictable variety of operational contexts. Defined accountability and responsibility for self and others in achieving the watchkeeping outcomes is involved. d. Work requires some judgement and teamwork in carrying out engineering watchkeeping duties and procedures for vessels of unlimited propulsion power. This includes supervision and control of personnel, hazard minimisation, analysis of performance and operational situations and related decision making and record keeping.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of unlimited propulsion power b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Watchkeeping principles (as laid out in the AMSA Marine Orders) include: <ul style="list-style-type: none"> c.1. a safe engineering watch must be maintained at all times c.2. all necessary precautions must be taken to avoid pollution of the marine environment c.3. appropriate assistance must be available to be summoned to the engine room if required by a change in the vessel's operational situation d. Propulsion plant configurations may include: <ul style="list-style-type: none"> d.1. low speed, medium and high speed diesel propulsion d.2. stern tube bearing d.3. CPP d.4. direct drive shaft d.5. diesel electric d.6. steam or gas turbine d.7. reduction gears d.8. thrust blocks, detuners and shaft bearings e. main and auxiliary machinery and associated systems may include: <ul style="list-style-type: none"> e.1. steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls e.2. steam boilers e.3. steering gear, stabilizers, bow thrusters, rudders e.4. fluid power systems and controls e.5. pumps and pumping systems e.6. auxiliary systems and controls, including <ul style="list-style-type: none"> e.6.1. fresh and salt water cooling systems e.6.2. lubricating oil cooling systems e.6.3. fuel, oil, gas, coal e.6.4. air starting e.6.5. lubrication e.6.6. onboard air compressors and compressed air and control air systems e.6.7. waste management and pollution control systems as per the MARPOL Convention e.6.8. sewage plant e.7. fixed fire fighting installations and fire control systems

Range Of Variables (continued)

MAINTAIN A SAFE ENGINEERING WATCH

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>f. Fatigue management strategies may include:</p> <ul style="list-style-type: none"> f.1. recognition of symptoms of fatigue f.2. arranging to take a break when symptoms of fatigue are identified f.3. maintenance of personal fitness and health and appropriate dietary habits f.4. avoidance of excessive consumption of alcohol prior to watchkeeping duties <p>g. Emergencies may include:</p> <ul style="list-style-type: none"> g.1. loss of propulsion or steerage g.2. flooding of engine room g.3. fire or explosion in engine room g.4. loss of refrigeration g.5. loss of water making ability g.6. fuel oil, lubrication oil, steam and gas leaks g.7. loss of electrical power g.8. pump failure g.9. overheating and overspeed of machinery, governors, emergency trips <p>h. Potential hazards during operation of main and auxiliary systems may include:</p> <ul style="list-style-type: none"> h.1. operating equipment beyond safe working limits h.2. moving and rotating machinery h.3. working in confined spaces h.4. faulty machinery equipment handling equipment and lifting gear h.5. non-compliance with safe working procedures h.6. hot pipes and valves (steam, fuel oil, lubricating oil) h.7. cold pipes and valves (refrigeration and liquefied gas cargoes) h.8. flammable liquids, vapours and fuel h.9. working at heights and in confined spaces h.10. moving heavy loads using unsafe lifting procedures h.11. unsecured machinery, components or equipment h.12. slippery deck h.13. poor housekeeping procedures h.14. power tools, and sharp tools or implements h.15. dangerous atmosphere h.16. overspeed of electrical machinery, emergency trips h.17. noxious and dangerous cargoes h.18. machinery overload
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. ISM Code safety management system plans, procedures, checklists and instructions a.3. vessel and company's watchkeeping procedures and instructions a.4. plant and equipment manufacturer's specifications, instructions and recommended procedures a.5. plant and equipment running sheets, operations logs and other operational records, including computer database of running information, where relevant a.6. vessel's survey as it relates to shipboard plant and equipment a.7. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with the keeping of an engineering watch a.8. instructions of relevant Maritime Authorities and class societies concerning the keeping of an engineering watch
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to the keeping of an engineering watch a.2. relevant sections of AMSA Marine Orders related to the keeping of an engineering watch a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MAINTAIN A SAFE ENGINEERING WATCH

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement engineering watch keeping arrangements and procedures a.2. Fulfil engineering watchkeeping responsibilities a.3. Take appropriate action in the event of an engine room malfunction arising during a watch a.4. Communicate effectively with others in the course of watchkeeping duties
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an officer in charge of an engineering watch on a commercial vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of the IMO STCW 95 Code and AMSA Marine Orders dealing with the keeping of an engineering watch b. Relevant OH&S pollution control legislation, codes of practice, policies and procedures c. The duties and responsibilities of a Watchkeeper Engineer on both manned and UMS vessels with respect to safety of personnel and vessel, when taking over, keeping and handling over a watch d. The principles and procedures for the operation and maintenance of a vessel's main and auxiliary systems, including start up, normal running, shut down, and emergency situations e. The layout of a typical engine room and the functions of all systems and components found therein: including their purposes and relationships with other systems, including: <ul style="list-style-type: none"> e.1. the main engine systems,. e.2. the systems of the boiler and waste heat unit e.3. the diesel alternator systems e.4. the turbo-alternator systems e.5. the systems and controls of the Engine Control Room e.6. the ancillary systems of the engine room e.7. common operating parameters of fluids within the engine room, and state correct responses to abnormal values e.8. the location, function, and operation of all safety and protection devices, including all alarms, shutdowns and engine room escape routes, including an awareness of the risks associated with defective or bypassed machinery protective devices e.9. the location, function, and operation of main and auxiliary machinery monitoring devices e.10. the types of steering gears commonly employed, their components, the regulations governing their use, and testing procedures e.11. an understanding of single failure criterion and how steering gear systems fulfil this criterion e.12. typical transmission systems from the main propulsion engine to the propeller, including typical clutches found along a typical drive line, and explain how emergency operation may be achieved f. Malfunctions and defects in the main and auxiliary systems and components systems, their symptoms and possible consequences, and methods of correcting and/or compensating for them g. Safe working practices for machinery and enclosed spaces, including: <ul style="list-style-type: none"> g.1. safe practices for isolating main and auxiliary machinery prior to work commencing g.2. hazard minimisation and control during work at sea, in heavy weather, at anchorage in port, or during dry dock h. The working principles of fire prevention, detection, and fighting, including: <ul style="list-style-type: none"> h.1. actions that should be carried out if a fire is detected and h.2. actions that should be carried out if it is decided to use a fixed installation to combat a major fire, especially if CO₂ is to be used. i. Watchkeeping records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities j. Basic supervisory, teamwork, and communication skills as they relate to the responsibilities of an officer on the engineering watch, including: <ul style="list-style-type: none"> j.1. communication skills required in simulated and real engine room operations. j.2. the various tools available to communicate between the Bridge, Engine Control Room, and Main Engine Room j.3. teamwork in simulated and real engine room operations, including start up, normal running, shut down, and emergency situations j.4. basic supervisory skills required when acting as team leader in simulated and real engine room operations, including start up, normal running, shut down, and emergency situations.

Evidence Guide (continued)

MAINTAIN A SAFE ENGINEERING WATCH

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none">k. Elementary principles of internal combustion engine cycles, including:<ul style="list-style-type: none">k.1. the operating principles of two stroke and four stroke internal combustion enginesk.2. the Otto, Diesel and Dual combustion cyclesk.3. Methods for calculating mean effective pressure using an indicator diagramk.4. the indicated power formulak.5. specific fuel consumption and thermal efficiencyk.6. the ideal cycle and air standard efficiencyk.7. the effects of insufficient, minimum and excess air on combustionl. The operating cycle of refrigeration and related problems on refrigeration plant performance, including:<ul style="list-style-type: none">l.1. the principles of refrigerationl.2. the refrigeration cycle as a pressure/enthalpy diagraml.3. the properties of refrigerants used in refrigeration plantsl.4. refrigeration effect and plant capacityl.5. ways of calculating the refrigeration effect and condition of vapour after expansion, using refrigeration tablesm. The psychrometric chart and the cycle of operation and working principles of air conditioning plants, including the meaning of psychrometric terms such as relative humidity dry and wet bulb temperaturesn. Procedures for the operation of the main and auxiliary systems and components in warm through, start up, manoeuvring, normal running, emergency, and shut down situationso. The types, properties, tests, applications and treatment of fuels, lubricants, and solvents/chemicals used on board vessel, including a basic understanding of the working principles, construction, maintenance and safe operation of centrifuges, filters, and other treatment devicesp. Basic principles of operation of boilers and steam systems, including:<ul style="list-style-type: none">p.1. understanding of how combustion occurs in a boiler, and related safety procedures, including the importance of purging a boiler and other safety precautions taken when firing a boilerp.2. principles of boiler operation in normal and emergency situationsp.3. typical feed systems for marine boilers, including all components normally found in such systemsp.4. a basic understanding of the various fittings mounted on boilers, including:<ul style="list-style-type: none">p.4.1. the common operating routines of local water level indicators, including methods of blowing a gauge glass, clearing blockages, and overhaul of these devicesp.4.2. the effects of blockages in the water, steam and drain cocks of water level indicatorsp.5. how a boiler is flashed up from cold and put on linep.6. the purpose of all alarms and shut downs incorporated in a marine boilerp.7. typical configurations of, and describe the operating principles applying to, the various steam distribution systems found aboard vesselp.8. the checks which should be made regularly during routine turbine operationq. Basic principles of operation of turbine systems, including:<ul style="list-style-type: none">q.1. the methods of turbine control, including safety devicesq.2. the symptoms, causes, effects, and actions to be taken of defects of auxiliary steam turbinesq.3. the construction and operation of auxiliary steam turbinesq.4. procedures for emergency operation of a steam turbineq.5. methods of lubricating the principle components of a marine steam turbine and its associated gearing, and evaluate common faults including common lubrication faults, symptoms, causes, and actions to be taken with such faultsr. The causes, symptoms, means of preventing, detecting, and extinguishing fires and the correct procedures to be taken upon their detection, including:<ul style="list-style-type: none">r.1. scavenge fires.r.2. crankcase explosions in both diesel and dual fuel engines.r.3. starting airline explosions.r.4. the risks of continued service with an isolated waste heat unit.s. Operating precautions for main and auxiliary machinery and associated control systems to ensure operational performance is in compliance with the bridge orders, technical specifications, survey requirements and established safety and anti-pollution rules and regulations. Main and auxiliary machinery monitoring and protection devices.
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Evidence Guide (continued)

MAINTAIN A SAFE ENGINEERING WATCH

<p>3. Required knowledge and skills (continued)</p>	<p>t. Basic principles of diesel engine operations to a level suitable for an engineer in charge of an engineering watch, including</p> <p>t.1. typical starting air and manoeuvring systems of diesel engines, including all components normally found therein.</p> <p>t.1.1. starting methods of marine diesel engines and how propulsion manoeuvring is achieved</p> <p>t.1.2. requirements for diesel engines for propulsion, power generation, and emergency use.</p> <p>t.1.3. methods of reversing direct reversing engines with their interlocks and other safety arrangements.</p> <p>t.1.4. common faults and appropriate action to be taken with starting/manoeuvring systems.</p> <p>t.2. typical diesel engine lubrication systems, including</p> <p>t.2.1. all components normally found therein</p> <p>t.2.2. normal operational pressures and temperatures which should be expected.</p> <p>t.2.3. methods of lubricating the principle components of a marine diesel engine, with its associated gearing and/or chain drives, including common lubrication faults, symptoms, causes, and actions to be taken with such faults.</p> <p>t.3. the operating principles and adjustments of diesel engine fuel injection equipment, including common service faults, symptoms, and causes of diesel fuel injection problems, explaining appropriate actions to be taken.</p> <p>t.4. means of pressure charging diesel engines including common service faults and give appropriate actions to these faults and emergency operation and isolation procedures.</p> <p>t.5. different methods of cooling marine diesel engines, including common requirements of cooling.</p> <p>t.6. common faults and appropriate action to be taken with cooling of diesel engines.</p> <p>t.7. the causes of crankcase and airline explosions, scavenge and uptake fires.</p> <p>u. Basic thermodynamics as it relates to the responsibilities of an officer in charge of an engineering watch, including:</p> <p>u.1. basic thermodynamic properties of common working fluids.</p> <p>u.2. methods of heat transfer and related problems</p> <p>u.3. principles of heat transfer by conduction, convection and radiation and their application to marine systems</p> <p>u.4. elementary principles of steam plants</p> <p>u.5. basic steam plant cycles and explain the function of each component</p> <p>u.6. the combustion process and the calorific value of fuels</p> <p>u.7. AIR/FUEL ratio and the significance of excess air on combustion</p> <p>u.8. the operating cycle of single stage reciprocating air conditioners including methods for calculating the mass of air delivered</p> <p>u.9. clearance volume, its effect on volumetric efficiency and methods of calculating the volumetric efficiency</p> <p>u.10. advantages of multistaging and intercooling</p> <p>u.11. meaning of gauge and absolute pressure</p> <p>u.12. temperature and temperature scales</p> <p>u.13. SYSTEM INTERNATIONAL (SI) units and common thermodynamic terms and principles.</p>
<p>4. Resource implications</p>	<p>Access is required to opportunities to either</p> <p>a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to maintain the seaworthiness of a vessel in a range of operational situations, and/or</p> <p>b. assist in maintaining the seaworthiness of a vessel in a range of operational situations either:</p> <p>b.1. using a simulator, meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of simulated loading and operational situations</p> <p>b.2. in appropriate practical situations on an operational commercial or training vessel possible operation of a vessel during seetime training</p>

Evidence Guide (continued)

MAINTAIN A SAFE ENGINEERING WATCH

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 maintaining a safe engineering watch a.2 identifying and evaluating watchkeeping problems and determining an appropriate courses of action a.3 identifying and implementing improvements to engine room and bridge management procedures a.4 applying safety precautions relevant to engineering watchkeeping operations a.5 dealing with engine room malfunctions and emergencies arising during an engineering watch <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and AMSA Marine Orders b.2 OHS and pollution control regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 ISM Code safety management system procedures, quality procedures and work instructions on the keeping of an engineering watch b.5 environmental protection procedures <p>c. Action taken promptly to report and/or rectify engine room malfunctions and emergencies in accordance with manufacturer's instructions, statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	3	3	2	3

TDM MF37 01A MANAGE VESSEL OPERATIONS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to manage the operations and resources of a vessel, including fulfilling legal responsibilities, the implementation of the International Safety Management (ISM) Code, development and implementation of the vessel's ISM and safety management system, following of procedures to obtain a Safety Management Certificate and undergoing subsequent audits, the planning, implementation and monitoring of OHS procedures and practices onboard a vessel, monitoring and controlling expenditure related to the vessel's budget, analysing and compiling voyage data, and preparing related reports, investigating, analysing and compiling casualty data and preparing related reports.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Develop plans for general and specific vessel operations</p>	<ul style="list-style-type: none"> a. Goals and objectives of vessel operations are identified in accordance with company procedures operational orders, regulatory requirements and established marine management practice b. Plans for general and specific vessel operations are drawn up c. Correct procedures for emergency response onboard a vessel are developed in accordance with company procedures operational orders, regulatory requirements and established marine management practice d. Appropriate validation measures and standards are devised to monitor progress in operations against the plans e. Appropriate contingency plans are developed for any discrepancies or variations that may occur in the course of operations f. Opportunities for improvement to services procedures and systems are identified and appropriate measures are taken to act on these opportunities in accordance with company procedures and established marine management practice g. Plans, goals, objectives and instructions for general and specific vessel operations and emergency and contingency procedures are distributed to relevant personnel in accordance with company procedures and established marine management practice
<p>2. Ensure legal requirements are fulfilled</p>	<ul style="list-style-type: none"> a. Legal obligations under the Articles of Agreement are fulfilled b. Laws and regulations pertaining to vessel operations and contingencies are implemented c. Entries are made into the vessel's Official Log Book as required d. Appropriate arrangements are made for the preparation of a vessel for statutory survey and certification e. The relevant Code of Conduct and industrial agreements are applied to vessel operations and management
<p>3. Monitor and control vessel expenditure</p>	<ul style="list-style-type: none"> a. Accrual accounting procedures are correctly used to monitor and control vessel expenditure b. Where relevant, the vessel's budget is prepared in accordance with established vessel's financial procedures and established accounting practice c. Plans and appropriate contingency procedures are developed to correct any variation from the vessel's budget d. Vessel expenditure is recorded in accordance with established vessel's financial procedures and established accounting practice e. Vessel expenditure is compared against the vessel's budget at established times in accordance with established vessel's financial procedures and established accounting practice and any variation from the planned budget identified f. Appropriate action is taken in the event of variation expenditure from the vessel's budget in accordance with contingency plans, company procedures and established accounting practice

<p>4. Develop and implement the vessel's ISM Code Safety Management System</p>	<ul style="list-style-type: none"> a. A Safety Management System (SMS) for the vessel is developed in accordance with the requirements of the International Safety Management (ISM) Code and company procedures b. Safety procedures and related documentation required in an ISM Code Safety Management System are developed in collaboration with relevant vessel personnel c. The structure and content of the vessel's ISM documentation meets the requirements of the ISM Code d. SMS manuals and related documentation meeting ISM Code requirements are reproduced and disseminated to relevant personnel onboard a vessel e. Appropriate measures are taken to ensure all personnel onboard a vessel are familiar with SMS documentation and apply SMS procedures relevant to their functions f. Appropriate arrangements are made for new personnel to be instructed in their role and responsibilities under the vessel's ISM Code Safety Management System g. Correct procedures are followed to obtain a Safety Management Certificate under the ISM Code in accordance with international and national regulatory requirements h. Compliance with the requirements of the ISM Code Safety Management System is monitored, verified, reviewed and evaluated in accordance with company procedures and appropriate action taken in situations where SMS requirements are not being met i. Correct procedures are followed for both internal and external auditing, verification and control of the vessel's SMS to maintain certification under the ISM Code in accordance with international and national regulatory requirements j. Safety incidents and casualties onboard a vessel are investigated, analysed and reported in accordance with the vessel's ISM Code, company procedures and OHS regulatory requirements
<p>5. Monitor and control vessel's physical resources</p>	<ul style="list-style-type: none"> a. The vessel's inventory of plant, equipment and other physical resources is maintained in accordance with company procedures, vessel's survey requirements and established marine management practice b. Reports of faulty, worn or damaged plant, equipment and resources are acted upon for repair or replacement in accordance with company procedures, vessel's survey and regulatory requirements and established marine management practice c. Reports are prepared on the status of the vessel's physical resources and are submitted to relevant personnel within the company and regulatory authorities in accordance with company procedures, vessel's survey requirements and established marine management practice
<p>6. Analyse and compile voyage data</p>	<ul style="list-style-type: none"> a. Voyage data is collected and compiled in accordance with company practice, regulatory requirements and established marine management practice b. A voyage report is prepared and validated in accordance with company procedures, vessel's survey requirements and established marine management practice c. Voyage report is submitted to designated personnel in accordance with company procedures, vessel's survey requirements and established marine management practice

Range Of Variables

MANAGE VESSEL OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental operational, financial, resource and safety management principles across a wide and often unpredictable variety of operational contexts. Contribution to the development and implementation of a broad operations and resources management plan and an ISM Code Safety Management System consistent with regulatory requirements and the operational needs of the vessel is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, management and leadership functions related to operational, financial, resource and safety management. This includes management and control of personnel, finances and physical resources, analysis of situations and related decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more (in the case of Masters) and unlimited propulsion power (in the case of Engineers) b. Shipboard administration and management may include: <ul style="list-style-type: none"> b.1. developing and monitoring plans for general and specific operations onboard the vessel b.2. establishing and monitoring performance standards for vessel operations b.3. developing and monitoring the implementation of the vessel's ISM Code Safety Management System b.4. investigating and reporting upon safety incidents and emergencies b.5. developing and implementing vessel's emergency procedures and contingency plans b.6. developing and implementing procedures for the monitoring and control of expenditure b.7. developing and implementing procedures for the monitoring and control of plant, equipment and physical resources b.8. collecting and compiling voyage data and preparing voyage reports c. Vessel's operations may include: <ul style="list-style-type: none"> c.1. navigation c.2. cargo handling and care c.3. berthing and de-berthing c.4. mooring operations c.5. slipping operations c.6. engine room operations and maintenance c.7. bridge operations c.8. radio operations c.9. personnel training c.10. safety / emergency drills c.11. deck operations and maintenance c.12. emergency and damage control operations c.13. pollution control operations c.14. catering operations c.15. passenger service operations d. Laws and regulations pertaining to vessel's operations and contingencies may relate to: <ul style="list-style-type: none"> d.1. safety (Australian regulations and IMO conventions) d.2. marine pollution (Australian laws and IMO conventions) d.3. immigration d.4. quarantine d.5. salvage and towage d.6. stowaways d.7. refugees d.8. wrecks d.9. deaths and disappearances d.10. agency d.11. drugs d.12. smuggling d.13. piracy

Range Of Variables (continued)

MANAGE VESSEL OPERATIONS

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>e. Legal issues relevant to a Master's or Chief Engineer's responsibility may include:</p> <ul style="list-style-type: none"> e.1. functions and responsibilities of the shipowner and charterer in various types of charters e.2. shipowner's obligation of reasonable dispatch e.3. lay time, demurrage and dispatch e.4. functions of a Bill of Lading e.5. characteristics of a Contract of Carriage e.6. international conventions relating to liability of a sea carrier e.7. salvage and towage contracts e.8. tort liability e.9. legal principles of pilotage e.10. Admiralty Jurisdiction e.11. insurance arrangements e.12. vessel registration requirements e.13. investigations and Courts of Marine Inquiry <p>f. Vessel's physical resources may include:</p> <ul style="list-style-type: none"> f.1. engine room propulsion plant and equipment and related auxiliary systems f.2. tools and maintenance equipment f.3. vessel's structures and fittings f.4. bridge equipment and resources f.5. vessel's deck equipment, fittings and related systems f.6. navigation charts, marine publications, manufacturer's manuals and other reference documentation f.7. radio equipment and facilities f.8. catering equipment and facilities f.9. accommodation equipment and facilities
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. ISM Code a.3. OHS regulations and procedures a.4. IMO STCW 95 Convention and Code a.5. AMSA Marine Orders a.6. company's management procedures a.7. vessel's general and specific operational and contingency plans a.8. vessel's emergency procedures a.9. vessel's plant and equipment inventory a.10. vessel's survey requirements a.11. vessel's log a.12. vessel's accrual accounting and financial procedures a.13. vessel's budget a.14. voyage reporting procedures a.15. safety and emergency incident reporting requirements a.16. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to the management of vessels of 500 gross tonnage or more a.2. ISM Code a.3. SOLAS Convention a.4. MARPOL Convention a.5. relevant sections of AMSA Marine Orders a.6. relevant international, Australian and State/Territory OH&S and pollution control legislation a.7. Australian OHS and pollution control legislation and related policies a.8. relevant International and national financial, safety and operational management standards

Evidence Guide

MANAGE VESSEL OPERATIONS

1. Critical aspects of evidence to be considered	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none">a.1. Develop and implement plans for general and specific vessel operationsa.2. Develop and implement the vessel's ISM Code Safety Management Systema.3. Monitor and control vessel expenditurea.4. Monitor and control vessel's physical resourcesa.5. Analyse and compile voyage dataa.6. Identify typical human resource management problems and take appropriate actiona.7. Communicate effectively with others as part of human resource management
2. Interdependent assessment of units	<p>a. This unit of competency must be assessed in conjunction with other shipboard operations and resource management units that form part of a job role of the master or chief engineer (i.e. units ML1 Organise <i>and manage the crew</i> and MF3 Monitor <i>compliance with legislative requirements and measures to ensure safety of life at sea</i>).</p>
3. Required knowledge and skills	<ul style="list-style-type: none">a. Knowledge of relevant sections of IMO Conventions and Codes and AMSA Marine Ordersb. Knowledge and understanding of laws and regulations pertaining to vessel's operations and contingenciesc. General principles of integrated vessel and bridge managementd. Typical procedures for planning, implementing and monitoring goals and performance requirements for vessel operations and emergenciese. Relevant OH&S and pollution control legislation, codes of practice, policies and proceduresf. Principles and content of the International Safety Management (ISM) Codeg. The aims, objectives, advantages and disadvantages of the ISM Code and associated vessel's Safety Management Systemh. The relationship of the ISM Code with other IMO Conventions and Codesi. General provisions for the development and monitoring of a vessel's Safety Management Systemj. The typical structure of a vessel's ISM Code SMS documentation, including various forms of SMS manualsk. Procedures for obtaining a Safety Management Certificate and undergoing subsequent audits to maintain itl. Procedures for the collection, compiling, analysing and reporting on safety incidents and casualties onboard a vessel including the format and characteristics of a good safety incident reportm. Established marine resource management procedures and practicen. Vessel's survey requirementso. Methods of identifying problems in services to other departments or in procedures and systemsp. Techniques for evaluating and seeking alternatives for improvement of shipboard operational and emergency procedures and systemsq. Procedures for compiling and preparing a voyage report including typical contents and formatsr. Established financial management and accrual accounting procedures and practice, including a basic understanding of factors that assist in predictive monitoring of vessel's expenditures. Maritime communication techniques including barriers to effective communication and how to overcome themt. Typical shipboard operational, safety, financial, resource management problems and appropriate action and solutionsu. Procedures for action in the event of identified non-compliance with ISM Code Safety Management systems, OHS and pollution control regulations, vessel's survey requirements and other company and regulatory requirementsv. Procedures for the recording of operational, safety, financial, maintenance, emergency and other management –related information and data

Evidence Guide (continued)

MANAGE VESSEL OPERATIONS

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably simulated operational, safety, financial, emergency and contingency management activities covering a range of situations that are typically experienced on a commercial vessel: and/or b. contribute to operational, safety, financial, emergency and contingency management activities on a commercial vessel of appropriate size in an appropriate range of operational situations
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. developing and implementing plans for general and specific vessel operations a.2. developing and implementing the vessel's ISM Code safety management system a.3. monitoring and controlling vessel expenditure a.4. monitoring and controlling vessel's physical resources a.5. analysing and compiling voyage data and producing related reports a.6. identifying typical management problems and taking appropriate action a.7. communicating effectively with others as part of management functions b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2. ISM Code and associated vessel's Safety Management System and procedures b.3. OHS and pollution control regulations policies and procedures b.4. job procedures and work instructions b.5. ISM Code safety management system procedures b.6. relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.7. vessel's accrual accounting procedures c. Action taken promptly to report and/or rectify management problems in accordance with established maritime management practice d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF38 01A ESTABLISH ENGINE ROOM WATCHKEEPING PROCEDURES ON VESSELS OF LESS THAN 3,000 KW PROPULSION POWER

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to establish and maintain engine room watchkeeping arrangements on a commercial vessel of less than 3,000 kW propulsion power operating within offshore limits in compliance with Australian and international regulations and guidelines to ensure the safety of engine room operations, protection of the marine environment and the safety of the vessel and persons on board.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of an Engineer (Class 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Establish engine room working system and procedures</p>	<ul style="list-style-type: none"> a. Watchkeeping arrangements and procedures are established as required by maritime regulations and company procedures taking into account relevant factors b. The principles of engine room management are appropriately applied in the establishment of watchkeeping arrangements and procedures c. Composition of the engine room watch is determined in accordance with the principles set out in the relevant maritime regulations d. Engine room watchkeeping arrangements are documented as required and communicated to engine room personnel (where relevant)
<p>2. Supervise the engine room team</p>	<ul style="list-style-type: none"> a. The current competence of engine room personnel is evaluated and appropriate measures are taken to ensure all engine room personnel have the required level of competence b. Engine room personnel are assigned in accordance with their assessed level of current competence and experience and established engine room watchkeeping requirements c. Watchkeeping arrangements and procedures are explained to assigned engine room personnel and their duties and responsibilities confirmed d. Fatigue management strategies are applied within the engine room management team e. Watchkeeping operations are monitored and appropriate action is taken where they are found to be in breach of established arrangements, regulations and procedures

Range Of Variables

ESTABLISH ENGINE ROOM WATCHKEEPING PROCEDURES ON VESSELS OF LESS THAN 3,000 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of a significant range of watchkeeping principles across a wide and often unpredictable variety of operational contexts. Establishment and maintenance of engine room watchkeeping arrangements is required. Accountability and responsibility for self and others in achieving the required watchkeeping functions is involved. c. Work requires judgement in planning, organisational and leadership functions related to the establishment of watchkeeping arrangements and procedures for commercial vessels of less than 3,000 kW propulsion power. This includes organisation and supervision of engine room watchkeeping arrangements and staffing, and related decision making and contingency planning.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 3,000 kW propulsion power or less operating within offshore limits b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor b.8. when bunkering b.9. during cargo operations c. Watchkeeping principles include: <ul style="list-style-type: none"> c.1. watchkeeping functions must be maintained at all times c.2. all necessary precautions must be taken to avoid pollution of the marine environment c.3. assistance must be available to be summoned to the engine room if required by a change in the vessel's operational situation d. Fatigue management strategies may include: <ul style="list-style-type: none"> d.1. recognition of symptoms of fatigue d.2. arranging to take a break when symptoms of fatigue are identified d.3. maintenance of personal fitness and health d.4. appropriate dietary habits d.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties e. Factors to be taken into account when establishing engine room watchkeeping arrangements and the composition of the watch in the engine room include: <ul style="list-style-type: none"> e.1. engine room must never be left unattended unless vessel is UMS e.2. the operational status of engine room instrumentation, controls and alarms e.3. provision on the engine room of unmanned machinery space (UMS) controls, alarms and indicators e.4. unusual demands on the engine room watch arising from operational conditions e.5. the professional competence and experience of the vessel's officers and crew and their familiarity with the vessel's equipment, procedures, and propulsion capability e.6. the fitness for duty of any crew members on call who are assigned as members of the engine room watch e.7. features and characteristics of propulsion and auxiliary machinery and equipment e.8. the additional workload caused by the nature of the vessel's functions, immediate operating requirements and anticipated operations

Range Of Variables (continued)

ESTABLISH ENGINE ROOM WATCHKEEPING PROCEDURES ON VESSELS OF LESS THAN 3,000 KW PROPULSION POWER

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) a.2. operational orders a.3. relevant maritime regulations a.4. engine room procedures guide a.5. engine room records system a.6. company procedures a.7. instructions of relevant Maritime Authorities a.8. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. the Australian USL Code a.2. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ESTABLISH ENGINE ROOM WATCHKEEPING PROCEDURES ON VESSELS OF LESS THAN 3,000 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Establish engine room watch keeping arrangements and procedures a.2. Assign engine room watchkeeping responsibilities a.3. Assess current competence of engine room personnel in terms of their watchkeeping roles and responsibilities a.4. Monitor engine room watchkeeping procedures a.5. Communicate effectively with others concerning watchkeeping arrangements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the engineer Grade 3.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections USL Code dealing with engine room watchkeeping principles, arrangements, procedures, roles and responsibilities b. Relevant OH&S legislation and policies and procedures c. Engine room resource management systems d. Implications of a range of factors that can affect engine room watchkeeping functions and the composition of the engine room management team e. Causes of groundings, collisions and casualties when on board a vessel f. Engine room operational hazards and implications for watchkeeping g. Watch handover procedures h. Engine room instrumentation, controls and alarms i. Functions of unmanned machinery space (UMS) controls, alarms and indicators j. Ways of assessing the current competence of the vessel's engine room personnel and their familiarity with the vessel's equipment, procedures, and operational capability k. Features and characteristics of propulsion and auxiliary machinery, equipment and systems l. Signs of fatigue m. Fatigue management principles and techniques n. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate the ability to establish and manage engine room watchkeeping arrangements through a range of case studies, exercises and assignments that suitably-simulate a range of watchkeeping situations for a vessel of less than 3,000 kW propulsion power; and/or b. establish and manage the watchkeeping arrangements on an operational vessel of less than 3,000 kW propulsion power in an appropriate range of operational situations

Evidence Guide (continued)

ESTABLISH ENGINE ROOM WATCHKEEPING PROCEDURES ON VESSELS OF LESS THAN 3,000 KW PROPULSION POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 establishing and monitoring engine room watchkeeping arrangements a.2 identifying and evaluating engine room management problems and determining an appropriate courses of action a.3 applying safety precautions relevant to watchkeeping operations a.4 assessing competence and experience of vessel's officers and crew and their suitability for watchkeeping roles <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures (where applicable) b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant guidelines relating to engine room management and watchkeeping arrangements on board a vessel b.6 following engine room housekeeping processes b.7 waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify watchkeeping incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	1	2	2

TDM MF39 01A MAINTAIN RUNNING LOG INCLUDING FUEL CALCULATIONS AND WRITTEN REPORTS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to maintain a running log when operating a small vessel including working out simple operational and maintenance calculations, completing required running and maintenance logs, and writing related simple reports on operational and maintenance issues.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
1. Maintain a running log	<ul style="list-style-type: none">a. Obtain information on aspects of vessel performance as requiredb. Carry out basic calculations for small vessel operations in accordance with established practice and propulsion and equipment manufacturer's instructionsc. Enter required information into running and maintenance logs in accordance with procedures
2. Write simple reports on vessel operations	<ul style="list-style-type: none">a. Information on an operational, safety or maintenance issue or incident is identified and recordedb. Report is accurately written in the required format in accordance with company and regulatory requirementsc. Report is checked for accuracy, grammar and compliance with format and information requirements and edited accordinglyd. Report is forwarded to relevant personnel and a copy filed in accordance with procedures

Range Of Variables

MAINTAIN RUNNING LOG INCLUDING FUEL CALCULATIONS AND WRITTEN REPORTS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel. b. Completion of calculations and the completion of running and maintenance logs of a vessel may be required: <ul style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. while anchored or moored a.5. during maintenance operations a.6. when vessel is slipped c. Calculations may include: <ul style="list-style-type: none"> c.1. fuel capacity c.2. fuel consumption during a voyage c.3. voyage duration d. Simple reports may relate to: <ul style="list-style-type: none"> d.1. a safety incident d.2. a pollution incident d.3. an accident or collision d.4. an operational issue d.5. a maintenance issue or requirements d.6. passenger requirements or concerns d.7. cargo details or issues
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code a.2. running and maintenance logs a.3. company reporting procedures a.4. vessel maintenance records a.5. vessel and equipment manufacturer's instructions, specifications and recommended procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

MAINTAIN RUNNING LOG INCLUDING FUEL CALCULATIONS AND WRITTEN REPORTS

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none"> a. Assessment must confirm appropriate knowledge and skills to: <ul style="list-style-type: none"> a.1. Work out simple operational and maintenance calculations a.2. Maintain required running and maintenance logs on a small vessel a.3. Write simple reports on operational and maintenance issues a.4. Communicate effectively with others when completing required logs and running sheets
2. Interdependent assessment of units	<ul style="list-style-type: none"> a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).
3. Required knowledge and skills	<ul style="list-style-type: none"> a. Requirements for keeping running and maintenance logs and completing simple reports b. Methods for working out the basic calculations required when operating a small vessel c. Communication techniques required in the when keeping running and maintenance logs and writing simple reports on operational and maintenance issues on board a small vessel
4. Resource implications	<ul style="list-style-type: none"> a. Access is required to opportunities to either <ul style="list-style-type: none"> a.1. participate in a range of exercises and assessments that demonstrate the skills and knowledge to work out simple operational and maintenance calculations, maintain running and maintenance logs on a small vessel, and write simple reports on operational and maintenance issues, and/or a.2. work out simple operational and maintenance calculations, maintain required running and maintenance logs, and write required simple reports on operational and maintenance issues while in charge of a small commercial or training vessel:
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 working out simple operational and maintenance calculations, a.2 maintaining required running and maintenance logs on a small vessel a.3 writing simple reports on operational and maintenance issues and incidents b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of the Australian USL Code b.2 job procedures and work instructions c. Action is taken promptly to report issues and problems identified with operation and maintenance of a small vessel in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MF40 01A CARRY OUT BASIC OPERATIONAL ENGINEERING CALCULATIONS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to carry out basic operational engineering calculations when operating a small commercial vessel including conversion of volumes to litres and calculations of volume, specific gravity, bunkering capacity, specific fuel consumption, speed and range of vessel.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 2).

ELEMENT	PERFORMANCE CRITERIA
1. Carry out basic engineering calculations	<ul style="list-style-type: none">a. Information required for basic operational engineering calculations is obtained from readings on instrumentation and gauges or other relevant sources in accordance with proceduresb. Basic calculations for small vessel operations are carried out to accepted working tolerancesc. The results of basic engineering calculations are verified in accordance with established proceduresd. The results of calculations are applied to engineering operations as requirede. The results of operations and maintenance calculations are reported and recorded in accordance with procedures

Range Of Variables

CARRY OUT BASIC OPERATIONAL ENGINEERING CALCULATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian USL Code. b. Work is performed within defined operational procedures, with responsibility for own outputs in relation to the completion of required basic engineering calculations and the reporting and application of the outcomes of the calculations to the operation of a small vessel. It requires responsibility for the accuracy of the calculations and the appropriateness of their application to vessel operations.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel. b. Completion of calculations and the completion of running and maintenance logs of a vessel may be required: <ul style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. while anchored or moored a.5. during maintenance operations a.6. when vessel is slipped a.7. when bunkering a.8. during cargo operations c. Calculations may include: <ul style="list-style-type: none"> c.1. specific fuel consumption of vessel c.2. speed of vessel c.3. range of vessel c.4. volumes c.5. conversion of volume to litres c.6. specific gravity d. Calculations may be carried out: <ul style="list-style-type: none"> d.1. manually d.2. with the aid of tables and charts d.3. with the aid of a calculator d.4. with the aid of a computer
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code a.2. running and maintenance logs a.3. vessel and equipment manufacturer's instructions
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

CARRY OUT BASIC OPERATIONAL ENGINEERING CALCULATIONS

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none"> a. Assessment must confirm appropriate knowledge and skills to: <ul style="list-style-type: none"> a.1. Carry out basic engineering calculations a.2. Record and report the outcomes of basic engineering calculations on a small vessel a.3. Communicate effectively with others when completing and reporting on basic engineering calculations
2. Interdependent assessment of units	<ul style="list-style-type: none"> a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a Marine Engine Driver (Grade 2).
3. Required knowledge and skills	<ul style="list-style-type: none"> a. Knowledge of sections of the relevant regulations on the operation and maintenance of small vessels b. Methods for working out the basic engineering calculations required when operating a small vessel, including acceptable working tolerances c. Communication techniques required when completing and reporting on basic engineering calculations on board a small vessel
4. Resource implications	<ul style="list-style-type: none"> a. Access is required to opportunities to <ul style="list-style-type: none"> a.1. participate in a range of exercises and assessments that demonstrate the skills and knowledge to carry out and report on basic engineering calculations on a small vessel, and/or a.2. carry out and report on basic calculations while in charge of a small commercial or training vessel:
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. carrying out and reporting on basic engineering calculations, a.2. maintaining required records of engineering calculations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of the Australian USL Code b.2. procedures for working out engineering calculations using established methods b.3. job procedures and work instructions c. Action is taken promptly to report any operational and maintenance problems identified through engineering calculations d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MF41 01A CARRY OUT ENGINEERING CALCULATIONS RELATED TO MAINTENANCE AND OPERATIONS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to carry out engineering calculations and apply them to maintenance and operations decisions on a small commercial vessel.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 1).

ELEMENT	PERFORMANCE CRITERIA
1. Carry out engineering maintenance and operations calculations	<ul style="list-style-type: none">a. Information required for engineering and operations calculations is obtained from readings on instrumentation and gauges or other relevant sources in accordance with established proceduresb. Calculations for small vessel operations and maintenance are carried out in accordance with established proceduresc. The results of operational and maintenance calculations are verifiedd. The results of calculations are applied to operational or maintenance decisions in accordance with procedurese. The results of operations and maintenance calculations are recorded in accordance with company requirements

Range Of Variables

CARRY OUT ENGINEERING CALCULATIONS RELATED TO MAINTENANCE AND OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the completion of routine calculations and their application to operations and routine maintenance on a small vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel. b. Completion of calculations and the application of results to operational and maintenance decisions may be required: <ul style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. while anchored or moored a.5. during maintenance operations a.6. when vessel is slipped a.7. when bunkering a.8. during cargo operations c. Calculations may include: <ul style="list-style-type: none"> c.1. fuel and lubricating oil consumption during a voyage c.2. hourly fuel consumption c.3. theoretical steaming times and distances covered c.4. requirements for replenishing oil in oil tanks c.5. area and circumference of a circle c.6. volumes of regularly shaped tanks c.7. tank capacities and pumping capacities for tank filling and emptying c.8. calculations involving theoretical vessel speed, propeller pitch and R.P.M. c.9. calculations involving specific fuel consumption, power, speed and range c.10. use of calibration tables to measure quantities in tanks c.11. calculations involving stress, strain and safe working load c.12. calculations involving mechanical advantage, load effort and moments c.13. calculations involving units, specific gravity/relative density and levers c.14. conversion of fractions to decimals d. Calculations may be carried out: <ul style="list-style-type: none"> d.1. manually d.2. with the aid of tables and charts d.3. with the aid of a calculator d.4. with the aid of a computer
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation sources of information and records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code a.2. readings and data obtained from instrumentation, gauges, computers and other measuring devices a.3. calibration charts and tables a.4. running logs and databases a.5. company reporting procedures a.6. maintenance records a.7. vessel and equipment manufacturer's instructions, specifications and recommended procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation a.3. relevant international and Australian standards

Evidence Guide (continued)

CARRY OUT ENGINEERING CALCULATIONS RELATED TO MAINTENANCE AND OPERATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carry out operational and routine maintenance calculations on a small vessel a.2. Apply results of calculations to engineering operations and maintenance decisions a.3. Communicate effectively with others concerning their application to operational and maintenance decisions on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Methods for working out typical operational and maintenance calculations required when operating a small vessel b. Procedures and established marine practice concerning engineering calculations and their application to operations and maintenance decisions on a small vessel c. Procedures for recording the results of engineering calculations on a small vessel and their application to operations and maintenance decisions using manual and computer-based recording systems d. Issues related to the application of results of engineering calculations to typical operations and maintenance decisions on board a small commercial vessel e. Communication techniques required in carrying out relevant calculations and applying them to operations and maintenance issues on board a small commercial vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either</p> <ul style="list-style-type: none"> a. participate in a range of exercises and assessments that demonstrate the skills and knowledge to carry out the relevant calculations and apply them to operational and maintenance decisions on a small commercial vessel and to enter the outcomes of calculations into logs and record systems on a small vessel, and/or b. completion of engineering calculations and apply them to operational and maintenance decisions when carrying out marine engine driving functions on a small commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 carrying out calculations on a small vessel a.2 verifying the results of the calculations a.3 applying the results of the calculations to related operations and maintenance decisions a.4 maintaining required records of calculations and their application to operations and maintenance decisions b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of the Australian USL Code b.2 procedures for working out the relevant calculations using established methods b.3 job procedures and work instructions b.4 record keeping procedures and reporting requirements onboard a small vessel c. Action is taken promptly to report any operational and maintenance problems identified through engineering calculations d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

CARRY OUT ENGINEERING CALCULATIONS RELATED TO MAINTENANCE AND OPERATIONS

6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel
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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	2	2	1

TDM ML1 01A ORGANISE AND MANAGE THE CREW

Field L Human Resources

DESCRIPTION:

This unit involves the skills and knowledge required to organise and manage the crew of a commercial vessel, including allocating duties, conduct of required training and assessment and maintenance of expected standards of work and behaviour on board a vessel.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Provide leadership to officers and crew</p>	<ul style="list-style-type: none"> a. Provides support for officers and crew in their day-to-day work b. Provides feedback to officers and crew on the achievements and performance c. Treats officers and crew fairly, equitably and honestly in matters related to their day-to-day work d. Resolves conflicts with and between officers and crew fairly, honestly and effectively using appropriate conflict resolution techniques e. Takes appropriate action to prevent harassment and deals with it promptly, effectively and fairly should there be any indication that it may have occurred f. Listens and acts on suggestions for work improvements made by officers and crew g. Shares credit for achievements with officers and crew h. Provides a good example of a responsible, fair, sympathetic, equitable and diligent member of the shipboard team
<p>2. Allocate duties</p>	<ul style="list-style-type: none"> a. Work requirements are identified and clarified b. Plans for vessel operations are drawn up c. Competencies of officers and crew are assessed and confirmed d. Duties are assigned to officers and crew in accordance with their competence and capabilities e. Officers and crew are advised of their rostered duties in accordance with company procedures
<p>3. Maintain standards of work and behaviour on board a vessel</p>	<ul style="list-style-type: none"> a. Performance standards for officers and crew are set in conjunction with officers and crew in accordance with company procedures b. Required performance standards are communicated effectively to the officers and crew c. Staff are motivated to achieve to set standards of work performance using appropriate methods d. Performance of the officers and crew is monitored as required using appropriate methods in accordance with company procedures e. Outcomes of performance assessment are discussed with relevant officers and crew and agreement is reached on appropriate action to be taken where performance is found to be below the set standards
<p>4. Resolve conflicts</p>	<ul style="list-style-type: none"> a. Conflict situations are recognised and the issues involved are clarified with the personnel involved b. Solutions to the conflicts are negotiated using appropriate mediation and conflict resolution techniques

<p>5. Plan, organise and promote shipboard training and assessment</p>	<ul style="list-style-type: none"> a. Competencies required for work are identified, attained and maintained b. Competency deficiencies in personnel are identified and remedial action is initiated through counselling and training c. Workplace trainer and assessor requirements are identified and appropriate staff are trained and assigned as required d. Training opportunities are planned and organised for officers and crew in accordance with identified needs and company policy e. Shipboard drills are organised as required by regulations and company procedures f. Assessment of officers and/or crew during and after training activities and shipboard drills is carried out to confirm that required competencies and related knowledge have been demonstrated g. Completions of all paperwork related to the conduct and outcomes of training, drills and assessment on board a vessel
<p>6. Evaluate shipboard training and assessment</p>	<ul style="list-style-type: none"> a. Officers and crew are debriefed after training, drill and assessment activities using appropriate methods b. The efficacy of training, drill and assessment activities is evaluated based on feedback from participating officers and crew and other relevant evidence c. The outcomes of evaluations of training and assessment are discussed with trainers and assessors and appropriate action is taken to make any required improvements d. Reports on training and assessment evaluated and any resultant action are maintained and/or entered into the vessel's log as required

Range Of Variables

ORGANISE AND MANAGE THE CREW

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental human resource management principles across a wide and often unpredictable variety of operational contexts. Contribution to the development of a broad human resources plan and training strategy consistent with the operational needs of the vessel is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, training and leadership functions related to human resource organisation and management
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) b. Human resource management responsibilities may include: <ul style="list-style-type: none"> b.1. development of human resource management plans for the vessel b.2. establishment of performance standards for vessel operations b.3. establishment of competency standards for officers and crew on board a vessel b.4. evaluation of competence of officers and crew and the initiation of appropriate action to maintain competence b.5. allocation of duties to officers and crew b.6. motivation of shipboard personnel b.7. monitoring of performance of officers and crew b.8. organisation of required training, shipboard drills and assessment b.9. investigation and arbitration of shipboard conflicts b.10. implementation of equal employment policies c. Training may include: <ul style="list-style-type: none"> c.1. on-board group training activities c.2. on-board individual instruction c.3. shore-based training for shipboard personnel c.4. distance learning for shipboard personnel c.5. shipboard drills required by regulations or company policies
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. IMO STCW Convention and Code a.4. AMSA Marine Orders a.5. vessel's log a.6. company human resource procedures and policies a.7. relevant Australian Training Packages and competency standards a.8. industrial award requirements a.9. Australian Merchant Navy Code of Conduct a.10. equal employment policies and regulations a.11. relevant International Labor Conventions and measures a.12. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. ISM Code Safety Management System a.4. relevant international, Australian and State/Territory OH&S legislation a.5. Australian equal employment legislation and related policies a.6. relevant International Labor Conventions and measures

Evidence Guide

ORGANISE AND MANAGE THE CREW

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Develop and implement a human resource management plan for a vessel a.2. Allocate duties to officers and crew a.3. Set and monitor human resource performance and competency requirements for vessel operations a.4. Motivate shipboard personnel a.5. Identify and resolve shipboard conflicts a.6. Organise and evaluate training, drills and assessment activities a.7. Identify typical human resource management problems and take appropriate action a.8. Communicate effectively with others as part of human resource management
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master on a commercial vessel of 500 gross tonnage or more, or a chief engineer officer or second engineer officer on a commercial vessel of 3,000kW propulsion power or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Equal employment policies and regulations d. ISM Code Safety Management System e. Relevant industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements f. Principles of vessel and bridge human resource management g. Methods for the motivation of shipboard personnel h. Principles of effective leadership and teamwork i. Competency requirements for typical shipboard operations j. Training and competency assessment techniques and options suitable for shipboard personnel k. Techniques for the setting of performance standards and the evaluation of performance of shipboard personnel l. Methods for evaluating the efficacy of shipboard training, drills and competency assessment m. Maritime communication techniques including barriers to effective communication and how to overcome them n. National Training Packages and competency standards relevant to shipboard personnel o. Conflict resolution and mediation strategies and techniques p. Regulatory requirements for shipboard drills q. Human resource management problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to effectively organise and manage the crew on board a commercial vessel of 500 gross tonnage or more (in the case of masters), or 3,000 kW propulsion power (in the case of engineers), and/or b. assist in organising and managing the crew on board an operational commercial vessel

Evidence Guide (continued)

ORGANISE AND MANAGE THE CREW

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out human resource management functions on board a vessel a.2 identifying and evaluating human resource management problems and determining appropriate courses of action a.3 identifying and implementing improvements to human resource management plans, policies and procedures a.4 applying equal employment and safety requirements when developing and implementing human resource management plans a.5 resolving shipboard conflicts a.6 assessing performance of shipboard personnel a.7 evaluating efficacy of training, drills and assessment activities <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 equal employment and OHS regulations policies and procedures b.4 issue resolution procedures b.5 job procedures and work instructions b.6 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.7 shipboard training, drill and assessment procedures <p>c. Action taken promptly to report and/or rectify human resource conflicts and problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM ML2 01A **CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL**

Field L Human Resources

DESCRIPTION:

This unit involves the skills and knowledge required to contribute to effective human relationships onboard a commercial vessel, including performance of allocated duties and observation of expected standards of work and behaviour on board a vessel.

The unit is consistent with the related functional standard in Section A VI/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Contribute to the effective human relationships onboard a vessel</p>	<ul style="list-style-type: none"> a. Social responsibilities to other members of the crew onboard a vessel are fulfilled b. Contributes to the achievement of a harmonious working environment onboard a vessel c. Assists and encourages others in workplace activities d. Contributes to the solution of conflicts by participating in mediation and negotiations fairly, honestly and effectively e. Takes appropriate action to avoid and prevent harassment of others in the crew f. Maintains appropriate standards of hygiene and cleanliness required when living in an shipboard community g. Communicates with others effectively in the course of social and work activities h. Shares credit for achievements with others in the crew i. Provides a good example of a responsible, fair, sympathetic, equitable and diligent member of the shipboard team
<p>2. Observe standards of work and behaviour onboard a vessel</p>	<ul style="list-style-type: none"> a. Work is carried out individually and in association with others in accordance with established performance standards b. Feedback on assessed work performance is acknowledged, discussed and acted upon c. Personal skills and knowledge are developed through onboard training and other means to ensure an effective contribution to shipboard work activities d. Employment conditions are known, understood and followed e. Individual rights and responsibilities onboard a vessel are known, understood and fulfilled f. Drug and alcohol abuse are avoided as required by company and vessel's policy and procedures and regulatory requirements
<p>3. Resolve conflicts</p>	<ul style="list-style-type: none"> a. Conflict situations are recognised and appropriate assistance is sought to resolve the conflict with the personnel involved in accordance with vessel's procedures b. Contributes to action to solve conflicts by actively participating in appropriate mediation and conflict resolution procedures

Range Of Variables

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed as a member of a crew within defined work and social standards, with some responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of established standards to work and social behaviour on board a vessel. Contribution to the maintenance of good human and working relationships with others onboard a vessel is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Work and social responsibilities may include: <ul style="list-style-type: none"> b.1. compliance with performance standards for workplace activities b.2. achievement of required competency standards for personal duties on board a vessel b.3. cooperative response to evaluations of competence by senior officers and the initiation of appropriate action to maintain competence b.4. effective and timely completion of assigned duties b.5. compliance with conditions of employment b.6. fulfilment of individual work and social obligations b.7. maintenance of required standards of hygiene and cleanliness b.8. monitoring of own work and social performance b.9. participation in assigned training, shipboard drills and assessment b.10. contribution to the resolution of shipboard conflicts b.11. implementation of anti-discrimination and harassment policies b.12. avoidance of drug and alcohol abuse c. Opportunities to develop personal work competence may include: <ul style="list-style-type: none"> c.1. on-board group training activities c.2. on-board individual instruction c.3. shore-based training for shipboard personnel c.4. distance learning for shipboard personnel c.5. shipboard drills required by regulations or company policies

Range Of Variables (continued)

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. company human resource procedures and policies a.3. safety management system plans, procedures, checklists and instructions (where applicable) a.4. relevant Australian Training Packages and competency standards a.5. industrial award requirements a.6. equal employment policies and regulations a.7. relevant International Labor Conventions and measures a.8. instructions of relevant Maritime Authorities
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. the Australian USL Code a.2. relevant sections of AMSA Marine Orders a.3. IMO STCW 95 Code and Convention a.4. relevant international, Australian and State/Territory OH&S legislation a.5. ISM Code (where applicable) a.6. Australian equal employment legislation and related policies a.7. relevant International Labor Conventions and measures

Evidence Guide

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Contribute to a harmonious work and social environment onboard a vessel a.2. Carry out assigned duties to established standards a.3. Achieve and maintain workplace competency requirements a.4. Contribute to the resolution of shipboard conflicts a.5. Participate in assigned training, drills and assessment activities a.6. Maintain required standards of hygiene and cleanliness a.7. Identify typical work and social problems and take appropriate action a.8. Communicate effectively with others as part of onboard work and social activities
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of IMO STCW Convention and Codes and AMSA Marine Orders dealing with human relationships onboard a vessel b. ISM Code and associated ship's safety management system and procedures (where applicable) c. Relevant OH&S legislation, codes of practice, policies and procedures d. Anti-discrimination and harassment policies and regulations e. Relevant industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements f. Typical company and vessel's instructions and procedures for social behaviour and shipboard work and emergency situations g. Principles of effective social interaction and teamwork onboard a vessel h. Appropriate standards of hygiene and cleanliness required when living in an onboard community i. Maritime communication techniques including barriers to effective communication and how to overcome them j. Conflict resolution and mediation strategies and techniques used onboard a vessels k. Regulatory requirements for shipboard drills l. Human resource relationship problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to contribute to an effective harmonious work and social environment onboard a vessel, and/or b. contribute to an effective harmonious work and social environment on board an operational commercial vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 contributing to a harmonious work and social environment onboard a vessel a.2 carrying out work duties onboard a vessel a.3 identifying and evaluating human relationship problems and determining appropriate courses of action a.4 applying anti-discrimination, harassment, hygiene, and safety requirements when interacting with others in work and social activities a.5 contributing to the resolution of shipboard conflicts b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 vessel's safety management system and procedures b.3 anti-discrimination, harassment and OHS regulations policies and procedures b.4 job procedures and work instructions b.5 shipboard training, drill and assessment procedures c. Action taken promptly to report and/or rectify conflicts and human relationship problems in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</p>
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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	2	1	2	1	1	1

TDM ML3 01A ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

Field L Human Resources

DESCRIPTION:

This unit involves the skills and knowledge required to establish and maintain a harmonious workplace environment on board a commercial vessel, including providing leadership to the crew, informing crew of expected standards of work and behaviour, allocating appropriate duties to crew, training and assessment of crew members, and identifying and dealing with conflict.

The unit is consistent with the relevant functional standard in the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Provide leadership to crew	<ul style="list-style-type: none"> a. Provides support for members of crew in their day-to-day work b. Provides feedback to members of crew on the achievements and performance c. Treats members of crew fairly, equitably and honestly in matters related to their day-to-day work d. Resolves conflicts with and between officers and crew fairly, honestly and effectively using e. Takes appropriate action to prevent harassment and deals with it promptly, effectively and fairly should there be any indication that it may have occurred f. Listens and acts on suggestions for work improvements made by crew members g. Shares credit for achievements with crew h. Provides a good example of a responsible, fair, sympathetic, equitable and diligent member of the shipboard team
2. Allocate duties	<ul style="list-style-type: none"> a. Work requirements are identified and clarified b. Competencies of crew members are assessed and confirmed c. Duties are assigned to crew in accordance with their competence and capabilities d. Crew members are advised of their rostered duties in accordance with company procedures
3. Maintain standards of work and behaviour on board vessel	<ul style="list-style-type: none"> a. Performance standards for crewmembers are identified and interpreted in accordance with company procedures b. Required performance standards are communicated effectively to the crew c. Staff are motivated to achieve to set standards of work performance using appropriate methods d. Performance of the crew is monitored as required using appropriate methods in accordance with company procedures e. Outcomes of performance assessment are discussed with individual crew members and agreement is reached on appropriate action to be taken where performance is found to be below the set standards
4. Resolve conflicts	<ul style="list-style-type: none"> a. Conflict situations are recognised and the issues involved are clarified with the personnel involved b. Solutions to the conflicts are negotiated using appropriate mediation and conflict resolution techniques c. Records of shipboard conflicts and the outcomes of mediation are maintained in accordance with company procedures and established mediation practices

<p>5. Organise onboard training and assessment for crew</p>	<ul style="list-style-type: none"> a. Competencies required for work are identified and interpreted b. Competency deficiencies in crew members are identified and remedial action is initiated through counselling and training c. Workplace training needs are identified using appropriate assessment methods d. Training opportunities are organised for crew members in accordance with identified needs and company policy e. Shipboard drills are organised as required by regulations and company procedures f. Assessment of crew during and after training activities and shipboard drills is carried out to confirm that required competencies and related knowledge have been demonstrated g. Paperwork related to the conduct and outcomes of training, drills and assessment on board vessel is completed and securely filed in accordance with company procedures
<p>6. Evaluate onboard training and assessment</p>	<ul style="list-style-type: none"> a. Crew members are debriefed after training, drill and assessment activities using appropriate methods b. The efficacy of training, drill and assessment activities is evaluated based on feedback from participating crew and other relevant evidence c. The outcomes of evaluations of training and assessment are discussed with trainers and assessors and appropriate action is taken to make any required improvements d. Reports on training and assessment are evaluated, and any resultant action, are maintained and/or entered into the vessel's log as required

Range Of Variables

ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in achieving the specified quality and quantity of outcomes. It involves routine procedures necessary to establish and maintain a harmonious workplace environment onboard vessel and the achievement of solutions to a defined range of leadership and human resource management situations. c. Some discretion and judgement is required in anticipating and allowing for possible human resource problems and contingencies and the actions to be taken in these eventualities.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel metres in length engaged on coastal voyages b. Human resource management responsibilities may include: <ul style="list-style-type: none"> b.1. implementation of human resource management plans for the vessel b.2. implementation of performance standards for vessel operations b.3. application of competency standards for crew on board vessel b.4. evaluation of competence of crew members and the organisation of appropriate action to maintain competence b.5. allocation of duties to crew b.6. motivation of crew b.7. monitoring of performance of crew b.8. organisation of required training, shipboard drills and assessment b.9. investigation and mediation of shipboard conflicts b.10. implementation of equal employment policies c. Training may include: <ul style="list-style-type: none"> c.1. on-board group training activities c.2. on-board individual instruction c.3. shore-based training for shipboard personnel c.4. distance learning for shipboard personnel c.5. shipboard drills required by regulations or company policies
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. vessel's log a.3. human resource procedures and policies a.4. relevant Australian Training Packages and competency standards a.5. industrial award requirements a.6. Australian Merchant Navy Code of Conduct a.7. equal employment policies and regulations a.8. relevant International Labor Conventions and measures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code a.2. relevant Australian and State/Territory OH&S legislation a.3. Australian equal employment legislation and related policies a.4. relevant International Labor Conventions and measures

Evidence Guide

ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement a human resource management plan for a small commercial vessel a.2. Allocate duties to crew a.3. Monitor human resource performance and competency requirements for vessel operations a.4. Motivate crew a.5. Identify and resolve shipboard conflicts amongst crew a.6. Organise and evaluate training, drills and assessment activities a.7. Identify typical human resource management problems and take appropriate action a.8. Communicate effectively with others as part of human resource management
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a small commercial vessel engaged in coastal voyages.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime and human resources regulations b. Relevant OH&S legislation and policies c. Equal employment policies and regulations d. Relevant industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements e. Principles of vessel and bridge human resource management f. Methods for the motivation of shipboard personnel g. Principles of effective leadership and teamwork h. Competency requirements for typical shipboard operations i. Training and competency assessment techniques and options suitable for shipboard personnel j. Techniques for interpreting performance standards and evaluating the performance crew k. Methods for evaluating the efficacy of shipboard training, drills and competency assessment l. Maritime communication techniques including barriers to effective communication and how to overcome them m. National Training Packages and competency standards relevant to shipboard personnel n. Conflict resolution and mediation strategies and techniques o. Regulatory requirements for shipboard drills p. Human resource management problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably-simulated human resource management activities, case studies and exercises covering a range of situations that are typically experienced a small vessel engaged on a coastal voyage; and/or b. contribute to human resource management activities on in an appropriate range of operational situations on a small commercial or training vessel engaged on a coastal voyage.

Evidence Guide (continued)

ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out human resource management functions on board a small vessel a.2 identifying and evaluating human resource management problems and determining appropriate courses of action a.3 identifying and implementing improvements to human resource management plans, policies and procedures a.4 applying equal employment and safety requirements when developing and implementing human resource management plans a.5 resolving shipboard conflicts a.6 assessing performance of shipboard personnel a.7 evaluating efficacy of training, drills and assessment activities <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant regulations b.2 equal employment and OHS regulations policies and procedures b.3 issue resolution procedures b.4 job procedures and work instructions b.5 shipboard training, drill and assessment procedures <p>c. Action taken promptly to report and/or rectify human resource conflicts and management problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	1	1	1

TDM MR4 01A OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OF UNLIMITED PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate electrical machinery and electronic control machinery and equipment on a commercial vessel powered by main propulsion machinery of typically unlimited propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage and coordinate the operation of electrical machinery and electronic control equipment</p>	<ul style="list-style-type: none"> a. The operation of shipboard electrical machinery and electronic control equipment is coordinated and managed in accordance with the responsibilities of an Engineer (Class 1) b. Shipboard electrical machinery and electronic control equipment is managed and operated within the specified limits of performance in accordance with procedures and manufacturer's instructions and specifications c. The performance of shipboard electrical machinery and electronic control equipment is managed and monitored in accordance with vessel's survey requirements and manufacturer's instructions d. Advanced diagnostic techniques are used to investigate poor performance and faults and appropriate action is initiated to rectify the identified problems in accordance with the responsibilities of an Engineer (Class 1) e. Records of performance are maintained in accordance with vessel's procedures
<p>2. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during the operation of electrical machinery and electrical and electronic control equipment b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Appropriate action is taken in the event of an electrical and/or electronic equipment failure or emergency to isolate and secure the electrical and electronic equipment and the vessel and maintain the safety of the vessel and persons involved e. Shipboard emergency and contingency plans followed in the event of a electrical and electronic equipment failure or emergency

Range Of Variables

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice to the operation of electrical machinery and electronic control equipment typically found on a vessel of unlimited propulsion power across a wide and often unpredictable variety of contexts. Contribution to the development and implementation of a broad plan or strategy for the operation of shipboard electrical and electronic control equipment is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to the operation of electrical and electronic control equipment. This includes management, training and control of personnel, hazard minimisation, analysis of situations and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Shipboard electrical machinery and electrical and electronic control equipment may include that used on an Australian or international commercial vessel of unlimited propulsion power b. Operation of shipboard electrical machinery and electronic control equipment may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of electrical machinery and electronic control equipment may include but are not limited to: <ul style="list-style-type: none"> c.1. programmable logic controllers (PLCs) c.2. signal transmission systems used for monitoring and control c.3. temperature and pressure sensors c.4. electronic PID controllers c.5. analog to digital converters c.6. electrical and electronic equipment space monitoring alarm and control systems c.7. a.c. generators c.8. a.c. and d.c. motors, including: <ul style="list-style-type: none"> c.8.1. three phase induction motors such as squirrel cage, double cage, wound rotor and slip ring, TEFC, splash proof and submersible c.8.2. three phase synchronous motors c.9. three phase alternators and three phase transformers c.10. electronic instrumentation and power supply circuits c.11. main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> c.11.1. distribution circuits and wiring c.11.2. protection devices c.11.3. circuit breakers c.12. emergency supply systems including emergency generators, emergency switchboard and battery banks c.13. electronic governors c.14. deck electrical machinery c.15. radio, navigation and bridge equipment

Range Of Variables (continued)

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>d. Operational hazards may include:</p> <ul style="list-style-type: none"> d.1. moving and rotating electrical and electronic equipment d.2. using equipment beyond safe working limits d.3. poor housekeeping procedures d.4. non-compliance with safe working procedures d.5. hot pipes and valves (steam, fuel oil, lubricating oil) d.6. cold pipes and valves (refrigeration and liquefied gas cargoes) d.7. working at heights d.8. dangerous atmosphere d.9. overspeed of electrical machinery, emergency trips d.10. noxious and dangerous cargoes d.11. electric shock <p>e. Emergencies may include:</p> <ul style="list-style-type: none"> e.1. loss of electrical power e.2. short circuits and open-circuits in distribution systems e.3. loss of electronic / electrical control of systems e.4. flooding of engine room e.5. fire or explosion e.6. failure of emergency alarm and control systems e.7. loss of refrigeration e.8. overloading of electrical systems e.9. electric shock e.10. foundering/grounding of vessel
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. electrical and electronic equipment running sheets, operations logs and other operational records and/or computer database of running information a.5. vessel's survey procedures and instructions as they relate to shipboard electrical and electronic equipment a.6. vessel's safety and emergency contingency plans and procedures a.7. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.8. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard electrical and electronic control equipment operation a.9. instructions of relevant Maritime Authorities and class societies concerning shipboard electrical and electronic control equipment operation
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard electrical and electronic control equipment operation on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory electrical and electronic engineering practice standards

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage the operations of shipboard electrical and electronic control equipment a.2. Operate shipboard electrical and electronic control equipment against specifications on a vessel of unlimited propulsion power a.3. Identify malfunctioning and faulty electrical and electronic control equipment and components and initiate appropriate action for repair or replacement a.4. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation of shipboard electrical and electronic control equipment a.5. Identify electrical machinery and electronic control equipment operational problems and hazards and take appropriate action a.6. Communicate effectively with others during operation of electrical and electronic control equipment including effective use of internal communication systems a.7. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation of shipboard electrical and electronic control equipment on vessels of typically unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the operation of marine electrical machinery and electronic control equipment, systems and equipment d. Operational characteristics and performance specifications for the different types of shipboard electrical and electronic control equipment usually found on a vessel of typically unlimited propulsion power e. The nature and causes of typical shipboard electrical and electronic control equipment operational problems and the appropriate preventative and remedial action to be taken in each case f. A knowledge of the power distribution and control circuits used onboard a vessel of typically unlimited propulsion power and their associated operational electrical and electronic control equipment g. Principles and procedures for electrical and electronic measurement, including the use of oscilloscopes and multimeters and insulation resistance measurement using a Megger h. Principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including: <ul style="list-style-type: none"> h.1. electromagnetism and electrostatics h.2. electrolytic action and cells h.3. the electric circuit h.4. theory and calculations of AC and DC machines and related electrical and electronic control equipment h.5. cabling, distribution and lighting systems h.6. control and switch gear h.7. deck electrical and electronic equipment h.8. principles, calculations and diagnostics for shipboard electronic components and systems, including: <ul style="list-style-type: none"> h.8.1. electronics principles h.8.2. integrated circuits, microprocessors and PLCs h.8.3. process control theory h.8.4. instruments, calibration and testing h.8.5. electronic control, surveillance, measurement and recording systems h.8.6. telemetering devices h.8.7. alarm systems, including fire and emergency alarm systems h.8.8. main and auxiliary electrical and electronic equipment control and UMS h.9. theory and setting/tuning of 2 and 3 term controllers, including microprocessors

Evidence Guide (continued)

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none">i. Knowledge and ability to read and interpret electrical and electronic equipment performance readings and instrumentationj. Knowledge and ability to read and interpret Material Safety Data Sheetsk. Knowledge and ability to read and interpret vessel and electrical and electronic equipment specifications, equipment drawings, operational manuals, and electrical and control circuit diagramsl. Concepts of Unmanned Machinery Spaces (UMS) and automated monitoring and control of machinerym. Theory, calculations, practical characteristics and applications of shipboard electrical machines including:<ul style="list-style-type: none">m.1. a.c. and d.c. motorsm.2. a.c. generators including requirements for the parallel operation and the process of synchronisationm.3. three phase induction motors including the various starting methodsm.4. three phase motorsm.5. three phase synchronous motorsm.6. three phase alternators operating singly and in parallelm.7. three phase transformersn. Common active devices and their application in power electronic and electronic circuits typically used on a vessels of unlimited propulsion power, including:<ul style="list-style-type: none">n.1. ability to identify the devices and their circuit symbolsn.2. operating characteristics of common active devicesn.3. applications of common active deviceso. Common integrated circuit devices and their application in shipboard electronic instrumentation and power supply circuits, including:<ul style="list-style-type: none">o.1. operational amplifierso.2. voltage regulatorso.3. multivibratorsp. Common digital electronic circuits and their application in shipboard electronic instrumentation systems, including:<ul style="list-style-type: none">p.1. digital integrated circuitsp.2. analog to digital convertersp.3. microprocessorsp.4. digital communication bus transmission system using optical and electronic sub-systemsq. Procedures for diagnosing and repairing faults in 4 to 20 mA loops including:<ul style="list-style-type: none">q.1. open and short circuitsq.2. earth faultsq.3. high resistance jointsq.4. power supply faultsq.5. electronic component failurer. Elementary programming and program modification for programmable logic controllers (PLCs), including principles and applicationss. Operational records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authoritiest. Maintenance hazards and hazard identification and prevention strategiesu. Maritime communication techniques needed when operating electrical and electronic equipmentv. Safety, environmental and hazard control precautions and procedures relevant to the operation of shipboard electrical and electronic equipmentw. Safe procedures for the use of hand and power tools and maintenance equipment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none">a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated operational situations and other assessments that demonstrate the skills and knowledge to operate electrical and electronic equipment used on a vessel of unlimited propulsion power; and/orb. Operate shipboard electrical machinery and electronic equipment in a range of operational situations on a commercial or training vessel of unlimited propulsion power

Evidence Guide (continued)

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OF UNLIMITED PROPULSION POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 operating shipboard electrical machinery and electronic equipment</p> <p>a.2 assessing operational performance of shipboard electrical machinery and electronic equipment</p> <p>a.3 identifying operational problems with shipboard electrical machinery and electronic equipment and taking remedial action</p> <p>a.4 taking action to minimise any damage and safety risk that could be caused by electrical machinery and electronic equipment malfunctions</p> <p>a.5 identifying and implementing improvements to procedures for the operation of shipboard electrical machinery and electronic control equipment</p> <p>a.6 applying safety precautions relevant to the operation of shipboard electrical machinery and electronic control equipment</p> <p>a.7 completing operations documentation and records</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders</p> <p>b.2 OHS regulations and hazard prevention policies and procedures</p> <p>b.3 ISM Code safety management system procedures, quality procedures and work instructions on the operation of shipboard electrical machinery and electronic control equipment, including electrical and electronic equipment specifications and directions on equipment capability and limitations</p> <p>b.4 following on-board housekeeping processes</p> <p>c. Action taken promptly to report and/or rectify electrical machinery and electrical and electronic equipment malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is managed, controlled and completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	3	3	3

TDM MR5 01A **MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES
ON VESSELS OF UNLIMITED PROPULSION POWER**

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to manage fuel, bilge and ballast operations on a commercial vessel powered by main propulsion machinery of unlimited propulsion power within the scope of responsibility of a Marine Engineer (Class 1). This includes the management and coordination of relevant maintenance and fault-finding activities and the application of advanced diagnostic and problem solving techniques to maintenance procedures.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage fuel and ballast operations</p>	<ul style="list-style-type: none"> a. The organisation of fuel and ballast operations is carried out in accordance with the scope of responsibility of an Engineer (Class 1) b. Fuel and ballast operations are completed in accordance with vessel's procedures and machinery and equipment manufacturer's instructions and specifications c. The performance of machinery and equipment used in fuel and ballast operations is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance d. Out of specification performance and faults are identified and appropriate action initiated to report or rectify the problem in accordance with marine engineering practice and vessel's procedures e. Records of performance of machinery and equipment used in fuel and ballast operations are maintained on running sheets and operations logs in accordance with established procedures
<p>2. Carry out preventative maintenance of machinery and equipment used in fuel and ballast operations</p>	<ul style="list-style-type: none"> a. Preventative maintenance measures for machinery and equipment used in fuel and ballast operations are carried out in accordance with the scope of responsibility of an Engineer (Class 1) b. Identified faults in machinery and equipment used in fuel and ballast operations are investigated using advanced diagnostic techniques in accordance with the scope of responsibility of an Engineer (Class 1) c. Decisions are made to carry out temporary or permanent repairs depending on the vessel's position and circumstances within the scope of responsibility of an Engineer (Class 1) d. Appropriate consultation is taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required e. Management of the maintenance processes and the organisation and control of engine room personnel to facilitate repairs is in accordance with the scope of responsibility of an Engineer (Class 1)

<p>3. Carry out repairs on machinery and equipment used in fuel and ballast operations</p>	<p>a. Malfunctioning or faulty machinery or equipment used for fuel and ballast operation is correctly shut down, and disassembled, if necessary, in accordance with manufacturer's instructions, company procedures and established marine engineering practice</p> <p>b. Damaged or faulty components are repaired or replaced in accordance with the scope of responsibility of an Engineer (Class 1)</p> <p>c. Repaired machinery is re-assembled in accordance with manufacturer's instructions, company procedures and established marine engineering practice</p> <p>d. Repaired machinery is tested and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel</p> <p>e. Performance of repaired machinery and associated safety devices, control systems and alarms is tested in accordance with manufacturer's instructions</p> <p>f. Performance against recommended performance specifications is confirmed and the machinery is re-commissioned in accordance with vessel's procedures</p>
<p>4. Complete operational and maintenance and repair documentation</p>	<p>a. Correct records are kept relating to fuel and ballast operations and machinery failure incidents</p> <p>b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations</p>
<p>5. Follow safety and hazard control procedures</p>	<p>a. Fuel and ballast operations are conducted in accordance with relevant safety regulations and company procedures</p> <p>b. Operational hazards for fuel and ballast operations are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment</p> <p>c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during fuel and ballast operations</p> <p>d. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed</p> <p>e. Action is taken, in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and persons involved and shipboard emergency and contingency plans followed</p> <p>f. Personnel are trained and organised to implement shipboard emergency and contingency plans in the event of a machinery failure or emergency</p>

Range Of Variables

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the scope of responsibility of an Engineer (Class 1). c. Work involves the application of marine engineering practice to the management of fuel and ballast operations on a vessel of unlimited propulsion power across a wide and often unpredictable variety of contexts. Contribution to the development and implementation of a broad plan or strategy for the management of fuel and ballast operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to fuel and ballast operations within the scope of responsibility of an Engineer (Class 1). This includes management, training and control of personnel, analysis of the situation and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Fuel and ballast operations may be managed on an Australian or international commercial vessel of unlimited propulsion power b. Fuel and ballast operations may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. while anchored or moored a.1. when bunkering a.2. during cargo operations c. Types of machinery may include: <ul style="list-style-type: none"> c.1. pumps and pumping systems c.2. auxiliary systems and controls, including <ul style="list-style-type: none"> c.2.1. fuel, oil, gas, coal c.2.2. bilge and ballast system, oily water separator c.2.3. waste management and pollution control systems as per the MARPOL Convention c.2.4. cargo pumps, tank washing machines and associated systems d. Testing and repair equipment may include: <ul style="list-style-type: none"> d.1. meters and gauges, oxygen meter and gas detectors d.2. computer displays of performance parameters d.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. d.4. greasing and lubrication tools d.5. electric power tools, such as grinders, lathes, drills, etc. d.6. pneumatic power tools, such as grinders, sanders, drills, etc. d.7. welding equipment d.8. block and tackle and portable and manual lifting equipment, cranes and hydraulic jacks d.9. material safety data sheets d.10. protective clothing and equipment such as: <ul style="list-style-type: none"> d.10.1. eye and ear protection d.10.2. safety boots and helmet d.10.3. dust and fume masks d.10.4. boilersuit/overall

Range Of Variables (continued)

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>e. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> e.1. moving heavy loads in an unsafe work environment e.2. unsecured machinery, components or repair equipment e.3. slippery deck e.4. welding equipment e.5. sharp tools and implements, including power tools e.6. moving and rotating machinery e.7. flammable liquids, vapours and fuel e.8. faulty machinery equipment handling equipment and lifting gear e.9. using equipment beyond safe working limits e.10. poor housekeeping procedures e.11. non-compliance with safe working procedures e.12. hot pipes and valves (steam, fuel oil, lubricating oil) e.13. cold pipes and valves (refrigeration and liquefied) <p>f. Emergencies may include:</p> <ul style="list-style-type: none"> f.1. flooding of engine room f.2. fire or explosion in engine room f.3. fuel oil, lubrication oil, steam and gas leaks f.4. overheating and overspeed of machinery, governors, emergency trips f.5. dangerous atmosphere
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.4. maintenance log, running sheets and records including computer database of running information and maintenance records where relevant a.5. vessel's survey procedures and instructions as they relate to shipboard machinery used in fuel, bilge and ballast operations a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery operation, maintenance and repair a.7. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery operation, maintenance and repair
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard machinery operation, maintenance and repair on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Organise and manage fuel, bilge and ballast operations within the scope of responsibility of an Engineer (Class 1) a.2. Identify malfunctioning and faulty machinery and equipment used in fuel, bilge and ballast operations and components and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing fuel, bilge and ballast operations and related maintenance a.4. Identify typical operational problems and hazards when carrying out fuel, bilge and ballast operations and take appropriate action within the scope of responsibility of an Engineer (Class 1) a.5. Communicate effectively with others during fuel, bilge and ballast operations a.6. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the management of fuel and ballast operations on vessels of unlimited propulsion power b. Relevant OH&S and anti-pollution legislation, policies and procedures c. Established engineering practice for the management of fuel, bilge and ballast operations including pollution control measures and the maintenance of related machinery, systems and equipment d. Operational characteristics and performance specifications for the different types of shipboard machinery and equipment used in fuel, bilge and ballast operations e. Procedures for carrying out shipboard machinery testing, trouble-shooting and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations f. Planned maintenance systems and procedures for the performance monitoring of machinery and equipment used in fuel, bilge and ballast operations including responsibilities and requirements covered by various forms of vessel survey g. The nature and causes of typical fuel, bilge and ballast operational problems and the available methods for their identification and rectification, including machinery malfunction fault-finding techniques h. Fuel, bilge and ballast operational hazards and problems and appropriate preventative and remedial action and solutions i. Procedures for the shipboard treatment of fuel and lubricating oils, including: <ul style="list-style-type: none"> i.1. bunkering procedures and fuel transfer arrangements i.2. the use and operation of centrifugal separators i.3. the function and operation of a shipboard fuel blender and alternative fuel treatments j. Causes and effects of fuel and lubricating oil contamination and ways and means of controlling such contamination, including the sampling and testing of oil k. Procedures for assessing the performance of different fuel and ballast pumping systems and their components l. Operational problems that occur with pumps and pumping systems handling sea water and action that can be taken to minimise or rectify these problems m. Influences on vessel stability and correct procedures relating to dry-docking, free surface, cargo shift and other occurrences affecting stability n. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock o. Safety, environmental and hazard control precautions and procedures relevant to shipboard machinery inspection and maintenance operations p. Maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities q. Maritime communication techniques needed during fuel and ballast operations

Evidence Guide

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> r. Knowledge and ability to read and interpret material safety data sheets s. Knowledge and ability to read and interpret machinery performance readings and indications t. Knowledge of fuel, bilge and ballast systems, machinery and equipment and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams u. Awareness and understanding of fuel specifications v. Principles and procedures of machinery lubrication, including: <ul style="list-style-type: none"> v.1. theory and types of lubrication v.2. relative characteristics, and applications of mineral and synthetic oils v.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants w. Properties and characteristics of liquids, fuels and lubricants used onboard vessel.
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to manage fuel, bilge and ballast operations on a vessel of unlimited propulsion power, including the ability to identify an appropriate range of possible machinery malfunctions and take appropriate action; and/or b. Carry out fuel, bilge and ballast operations in a range of operational situations on a commercial or training vessel of unlimited propulsion power
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 managing fuel, bilge and ballast operations on a vessel of unlimited propulsion power a.2 identifying fuel, bilge and ballast machinery and equipment malfunctions on a vessel of unlimited propulsion power a.3 taking action to minimise any damage and pollution that could be caused by fuel, bilge and ballast machinery malfunctions a.4 identifying and evaluating fuel, bilge and ballast operational problems and determining an appropriate courses of action a.5 identifying and implementing improvements to fuel, bilge and ballast operational procedures a.6 applying safety precautions relevant to fuel, bilge and ballast operations a.7 completing operational and maintenance documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 anti-pollution procedures and regulations including the MARPOL Convention b.4 ISM Code safety management system procedures and work instructions fuel and ballast operations and related maintenance, including machinery specifications and directions on equipment capability and limitations b.5 machinery security procedures b.6 following on-board housekeeping processes b.7 waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail

Evidence Guide (continued)

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OF UNLIMITED PROPULSION POWER

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MR6 01A OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OF UNLIMITED PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate, monitor and evaluate engine performance on a commercial vessel powered by main propulsion machinery of unlimited propulsion power within the scope of responsibility of a Marine Engineer (Class 1). This includes the management and coordination of relevant maintenance and fault-finding activities and the application of advanced diagnostic and problem solving techniques to maintenance procedures.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
1. Operate and maintain engines and propulsion plant	<ul style="list-style-type: none"> a. Engines, propulsion plant and auxiliary machinery are managed and operated in accordance with the scope of responsibility of an Engineer (Class 1) b. The performance of engines and propulsion plant is monitored in accordance with bridge orders, company procedures, survey requirements and manufacturer's instructions and performance is compared with technical specifications and recommended limits of performance c. The methods of measuring the load capacity of the engines are in accordance with manufacturer's technical specifications d. Poor performance and faults are identified in accordance with established marine engineering practice e. Poor performance and faults are investigated in accordance with marine engineering practice and manufacturer's instructions and appropriate action initiated to rectify the identified problem f. Appropriate action is taken to prevent damage/failure in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions g. Faulty and worn engine equipment and components are identified and are reported and action is initiated as required for repair or replacement in accordance with company procedures and established marine engineering practice h. Decisions made to carry out temporary or permanent repairs depending on the vessel's position and circumstances i. Appropriate consultation taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required j. Management of the repair processes and the organisation and control of engine room personnel to facilitate repairs is in accordance with the scope of responsibility of an Engineer (Class 1)

<p>2. Repair faults in engines, propulsion plant or auxiliary machinery</p>	<ul style="list-style-type: none"> a. Identified faults in engines, propulsion plant or auxiliary machinery are investigated using advanced diagnostic techniques in accordance with the scope of responsibility of an Engineer (Class 1) b. Malfunctioning or faulty engines, propulsion plant or auxiliary machinery are correctly isolated and disassembled, if necessary, in accordance with manufacturer's instructions and established marine engineering practice c. Damaged or faulty components are repaired or replaced in accordance with the scope of responsibility of an Engineer (Class 1) d. Repaired engines, propulsion plant or auxiliary machinery are re-assembled in accordance with manufacturer's instructions and established marine engineering practice e. Repaired engines, propulsion plant or auxiliary machinery are re-started and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel f. Performance of repaired engines, propulsion plant or auxiliary machinery and associated safety devices, control systems and alarms is checked in accordance with manufacturer's instructions g. Performance against recommended technical specifications is confirmed and the engines, propulsion plant or auxiliary machinery is re-commissioned in accordance with vessel's procedures
<p>3. Complete operational and performance evaluation documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to the operation and performance evaluation of engines, propulsion plant and auxiliary equipment and any engine or machinery failure incidents b. All operational and performance evaluation documentation is completed in accordance with vessel's procedures, bridge orders, survey and company requirements and regulations
<p>4. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Vessel's safety management procedures and safety regulations are applied in the operation and performance evaluation of engines, propulsion plant and auxiliary machinery b. Hazards involved in engine, propulsion plant and auxiliary equipment operation and performance evaluation are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations d. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed e. Action is taken in the event of an engine or machinery failure or emergency to secure the engine or machinery and the vessel and maintain the safety of the vessel and persons involved and shipboard emergency and contingency plans followed

Range Of Variables

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the scope of responsibility of an Engineer (Class 1). c. Work involves the application of marine engineering practice to the operation, monitoring and evaluation of engine performance on a vessel of 3,000 kW operational contexts. Contribution to the development and implementation of a broad plan or strategy for the operation, monitoring and evaluation of engine performance is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to operation, monitoring and evaluation of engine and propulsion plant performance within the scope of responsibility of an Engineer (Class 1). This includes management and control of personnel, analysis of the situation and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The operation, monitoring and evaluation of engine and plant installation performance may be undertaken on an Australian or international commercial vessel of unlimited propulsion power b. The operation, monitoring and evaluation of engine performance may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. when bunkering b.7. during cargo operations c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine plant and boilers c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. Types of engines, propulsion equipment and related auxiliary machinery may include: <ul style="list-style-type: none"> d.1. Steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls d.2. steering gear, stabilizers, bow thrusters, rudders d.3. fluid power systems and controls d.4. pumps and pumping systems d.5. auxiliary systems and controls, including <ul style="list-style-type: none"> d.5.1. fresh and salt water cooling systems d.5.2. lubricating oil cooling systems d.5.3. fuel, oil, gas, coal systems and centrifuges d.5.4. air starting systems d.5.5. lubrication d.5.6. onboard air compressors and compressed air and control air systems d.5.7. waste management and pollution control systems as per the MARPOL Convention d.5.8. sewage plant d.5.9. fixed fire fighting installations and fire control systems d.5.10. auxiliary boilers and waste heat generators

Range Of Variables (continued)

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>e. Potential hazards during operations and performance evaluation of engines, propulsion plant and auxiliary machinery may include:</p> <ul style="list-style-type: none"> e.1. moving heavy loads using unsafe lifting procedures e.2. unsecured machinery, components or repair equipment e.3. slippery deck e.4. sharp tools and implements e.5. power tools e.6. moving and rotating machinery e.7. flammable liquids, vapours and fuel e.8. faulty machinery equipment handling equipment and lifting gear e.9. using equipment beyond safe working limits e.10. poor housekeeping procedures e.11. non-compliance with safe working procedures e.12. electrical wiring and systems e.13. hot pipes and valves (steam, fuel oil, lubricating oil) e.14. cold pipes and valves (refrigeration and liquefied gas cargoes) e.15. working at heights and in confined spaces e.16. dangerous atmosphere <p>f. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> a.1. meters and gauges a.2. computer displays of performance parameters a.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. a.4. greasing and lubrication tools a.5. electric power tools, such as grinders, lathes, drills, etc. a.6. pneumatic power tools, such as grinders, sanders, drills, etc. a.7. welding equipment a.8. block and tackle a.9. portable and manual lifting equipment and hydraulic jacks a.10. material safety data sheets a.11. protective clothing and equipment such as: <ul style="list-style-type: none"> a.11.1. eye and ear protection a.11.2. safety boots a.11.3. dust and fume masks a.11.4. safety helmet a.11.5. boiler suit/overalls <p>g. Emergencies may include:</p> <ul style="list-style-type: none"> g.1. loss of propulsion g.2. loss of electrical power g.3. loss of steerage g.4. flooding of engine room g.5. fire or explosion in engine room g.6. fuel oil, lubrication oil, steam and gas leaks g.7. overheating and overspeed of machinery, governors, emergency trips g.8. foundering/grounding of vessel
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. engines, propulsion plant and auxiliary machinery manufacturer's specifications, instructions and recommended procedures a.4. operational and performance log, running sheets and records including computer database of operational and performance records where relevant a.5. vessel's survey as it relates to engines, propulsion plant and auxiliary machinery a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.7. instructions of relevant Maritime Authorities and class societies concerning the operation and performance evaluation of engines, propulsion plant and auxiliary machinery

Range Of Variables (continued)

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none">a. Applicable procedures and codes may include<ul style="list-style-type: none">a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation and performance evaluation of engines, propulsion plant and auxiliary machinery on vessels of unlimited propulsion powera.2. relevant international, Australian and State/Territory OH&S legislationa.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OF unlimited propulsion power

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage, operate, monitor and evaluate the performance of engines, propulsion plant and auxiliary machinery within the scope of responsibility of an Engineer (Class 1) a.2. Identify malfunctioning and faulty engines, propulsion plant and auxiliary machinery and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.4. Identify typical operational and performance evaluation problems and hazards and take appropriate action within the scope of responsibility of an Engineer (Class 1) a.5. Communicate effectively with others during the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.6. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation and performance evaluation of engines, propulsion plant and auxiliary machinery on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the operation and performance evaluation of engines, propulsion plant and auxiliary machinery d. Operational characteristics and performance specifications for the different types of marine engines, propulsion plant and auxiliary machinery usually found on a vessel of unlimited propulsion power e. Procedures for carrying out performance evaluation of engines, propulsion plant and auxiliary machinery as part of routine operational and maintenance procedures to ensure performance is in compliance with the bridge orders, technical specifications, survey requirements and established safety and anti-pollution rules and regulations f. The nature and causes of typical malfunctions and/or poor performance of engines, propulsion plant and auxiliary machinery and the available methods for their detection and rectification g. Hazards and problems that can occur during the operation and performance evaluation of marine engines, propulsion plant and auxiliary machinery and appropriate preventative and remedial action and solutions h. Safety, environmental and hazard control precautions and procedures relevant to the operation and performance evaluation of engines, propulsion plant and auxiliary machinery i. Operational and performance evaluation records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities j. Maritime communication techniques needed during the operation and performance evaluation of engines, propulsion plant and auxiliary machinery k. Knowledge and ability to read and interpret machinery performance readings and indications l. Knowledge and ability to read and interpret material safety data sheets, vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams m. Procedures for the testing of boiler water, machinery cooling water and lubricating oil n. Principles and operational characteristics of internal combustion engines, including: <ul style="list-style-type: none"> n.1. two stroke and four stroke cycles n.2. optimum combustion parameters and their control n.3. diesel engine scavenging systems both in normal and emergency operation n.4. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised n.5. determination of shaft power n.6. irregularities in the performance of machinery and plant o. Principles of operation of hydraulic and electronic overspeed governors p. Methods of providing air for combustion

Evidence Guide (continued)

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OF UNLIMITED PROPULSION POWER

3. Required knowledge and skills
(continued)
- q. Principles of fuel systems, including:
 - q.1. typical injection pressures and viscosities for different grades of fuel
 - q.2. alterations to fuel pumps, camshafts and injectors for varying fuel types
 - q.3. differences between constant and variable injection timing of fuel
 - q.4. injection requirements for different speeds of diesel engine
 - q.5. common service faults, symptoms and causes of combustion problems and related solutions
 - q.6. fuel line pulsation damping devices and leakage protection
 - q.7. fuel valve cooling arrangements
 - q.8. uni-fuel and dual fuel systems
 - r. Principles of engine cooling and lubrication, including:
 - r.1. different methods of diesel engine cooling
 - r.2. need for treatment of engine cooling water
 - r.3. methods of treating engine cooling water
 - r.4. diesel engine lubrication requirements
 - r.5. theory and types of lubrication, including methods of lubricating diesel engine components
 - r.6. relative characteristics, and applications of mineral and synthetic oils
 - r.7. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - r.8. common lubrication problems and their solution
 - s. Principles of marine control systems, including:
 - s.1. common sensors and their associated transmitters
 - s.2. analysis of control loops
 - s.3. temperature and pressure control systems used onboard vessel
 - s.4. methods of load-dependent cooling of diesel alternators on heavy fuel oils
 - s.5. analysis of typical level control systems used onboard vessel
 - s.6. operation and application of electronic PID controllers
 - t. Principles and functions of machinery space monitoring and alarm systems including:
 - t.1. central cooling and load dependent cooling control systems
 - t.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control
 - t.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis
 - u. Theory and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including:
 - u.1. plans for hazard reduction
 - u.2. procedures for extinguishing scavenge fires and dealing with crankcase mist detector alarms
 - u.3. regaining of control after starting airline, crankcase and gearbox explosions
 - v. Principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:
 - v.1. heat transfer, including log mean temperature and circular pressure vessels
 - v.2. gases and gas cycles
 - v.3. properties and expansion of steam
 - v.4. steam cycles including a specific understanding of the use of entropy charts and modifications to the steam cycle
 - v.5. boilers and evaporators
 - v.6. steam turbines, including an understanding of isentropic efficiency
 - v.7. combustion with a specific understanding of volumetric analysis
 - v.8. refrigeration and air conditioning, including the use of entropy charts.
 - w. Principles and operational characteristics of steam turbines, gearing and associated equipment including:
 - w.1. lubrication
 - w.2. gear configurations
 - w.3. thrust blocks
 - w.4. air ejectors
 - w.5. determination of shaft power
 - w.6. irregularities in the performance of machinery and plant
 - x. Principles and operational characteristics of main and auxiliary boilers and associated equipment including:
 - x.1. boiler water tests and treatment
 - x.2. corrosion
 - x.3. superheaters
 - x.4. de-aerators
 - x.5. open and closed feed systems
 - x.6. uptake fires

Evidence Guide (continued)

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OF UNLIMITED PROPULSION POWER

4. Resource implications	<p>Access is required to opportunities to either:</p> <ol style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to operate and evaluate the performance of marine engines, propulsion plant and auxiliary systems typically found on a vessel of unlimited propulsion power; and/or b. Operate and evaluate the performance of marine engines, propulsion plant and auxiliary systems in a range of operational situations on a commercial or training vessel of unlimited propulsion power
5. Consistency in performance	<ol style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ol style="list-style-type: none"> a.1. operating, monitoring and evaluating the performance of engines, propulsion plant and auxiliary machinery a.2. identifying malfunctioning and faulty engines, propulsion plant and auxiliary machinery and initiate appropriate action for repair or replacement a.3. exercising all required safety, environmental and hazard control precautions and procedures when overseeing the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.4. identifying and implementing improvements to procedures for the operation and performance evaluation of engines, propulsion plant and auxiliary systems a.5. completing required documentation, reports and records when operating, monitoring and evaluating the performance of engines, propulsion plant and auxiliary machinery b. Shows evidence of application of relevant workplace procedures including: <ol style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on the operation and performance evaluation of engines, propulsion plant and auxiliary machinery, including machinery specifications and directions on equipment capability and limitations b.4. following on-board housekeeping processes b.5. waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify engine, plant and machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
6. Context for assessment	<ol style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ol style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ol style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MR7 01A PLAN AND SCHEDULE OPERATIONS ON VESSELS OF UNLIMITED PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to plan and schedule operations on a commercial vessel powered by main propulsion machinery of unlimited propulsion power within the scope of responsibility of a Marine Engineer (Class 1). This includes the management and coordination of relevant operational activities and the application of advanced diagnostic and problem solving techniques to operational difficulties.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
1. Plan operations of vessel's power installation and auxiliary machinery	<ul style="list-style-type: none"> a. Bridge orders and operational instructions for the proposed voyage are correctly interpreted in accordance with the scope of responsibility of an Engineer (Class 1) b. Capacity and technical specifications of engines, propulsion plant and auxiliary machinery are reviewed and confirmed c. Operational plans for the vessel's power installation and auxiliary machinery are prepared that suit the design parameters of the installation and machinery and the requirements of the proposed voyage in accordance with the scope of responsibility of an Engineer (Class 1) d. Contingency and emergency plans are prepared based on a risk assessment of potential engine room operational problems and hazards that could occur during the voyage in accordance with the scope of responsibility of an Engineer (Class 1)
2. Schedule operations of vessel's power installation and auxiliary machinery	<ul style="list-style-type: none"> a. Operational schedules for the vessel's power installation and auxiliary machinery are prepared based on the confirmed operational plan using established project planning techniques b. Operational schedules are documented in accordance with vessel and company procedures c. Operational schedules are distributed to relevant personnel onboard vessel in accordance with vessel and company procedures

Range Of Variables

PLAN AND SCHEDULE OPERATIONS ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the scope of responsibility of an Engineer (Class 1). c. Work involves the application of marine engineering management practice to the planning and scheduling of the operation of the vessel's power installation and auxiliary machinery on a vessel of 3,000 kW over the range of operational situations during a voyage. Contribution to the development and implementation of a broad plan or strategy for the operation of the vessel's power installation and auxiliary machinery is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to planning and scheduling the operation of the vessel's power installation and auxiliary machinery within the scope of responsibility of an Engineer (Class 1). This includes management and analysis of the power installation capacity and voyage requirements, problem solving, decision making and contingency planning.
2. Worksite environment	<ul style="list-style-type: none"> a. Planning and scheduling of the operation of power installation and auxiliary machinery may be undertaken for an Australian or international commercial vessel of unlimited propulsion power b. Operational scheduling and planning methods may include the use of: <ul style="list-style-type: none"> b.1. GANTT charts b.2. CPM / PERT network techniques b.3. Other project planning techniques c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine plant and boiler c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. Types of engines, propulsion equipment and related auxiliary machinery may include:: <ul style="list-style-type: none"> d.1. steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls d.2. steering gear, stabilizers, bow thrusters, rudders d.3. fluid power systems and controls d.4. pumps and pumping systems d.5. auxiliary systems and controls, including <ul style="list-style-type: none"> d.5.1. fresh and salt water cooling systems d.5.2. lubricating oil cooling systems d.5.3. fuel, oil, gas, coal systems and centrifuges d.5.4. air compressor and air starting systems d.5.5. lubrication d.5.6. bilge and ballast system, oily water separator d.5.7. refrigeration and air-conditioning plant and equipment d.5.8. onboard air compressors and compressed air and control air systems d.5.9. waste management and pollution control systems as per the MARPOL Convention d.5.10. fresh water evaporators reverse osmosis systems d.5.11. inert gas generator d.5.12. cargo pumps, tank washing machines and associated systems d.5.13. purifiers and clarifiers d.5.14. heaters d.5.15. sewage plant d.5.16. fixed fire fighting installations and fire control systems d.5.17. auxiliary boilers and waste heat generators d.5.18. life saving appliances d.5.19. maintenance to hull and vessel side valves

Range Of Variables (continued)

PLAN AND SCHEDULE OPERATIONS ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> e. Potential emergencies may include: <ul style="list-style-type: none"> e.1. loss of propulsion e.2. loss of electrical power e.3. loss of steerage e.4. flooding e.5. fire or explosion e.6. fuel oil, lubrication oil, steam and gas leaks e.7. overheating and overspeed of machinery, governors, emergency trips
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. details of scheduled voyage a.2. ISM Code safety management system plans, procedures, checklists and instructions a.3. vessel and company's operational procedures and instructions a.4. engines, propulsion plant and auxiliary machinery manufacturer's specifications, instructions and recommended procedures a.5. vessel's survey as it relates to engines, propulsion plant and auxiliary machinery a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.7. instructions of relevant Maritime Authorities and class societies concerning the operation of engines, propulsion plant and auxiliary machinery
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation of engines, propulsion plant and auxiliary machinery on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

PLAN AND SCHEDULE OPERATIONS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and schedule the operations of vessel's power installation and auxiliary machinery for the voyage of a vessel of unlimited propulsion power a.2. Comply with all required safety, environmental and hazard control precautions and procedures when planning the operations of vessel's power installation and auxiliary machinery a.3. Identify potential operational problems and hazards and develop appropriate contingency plans within the scope of responsibility of an Engineer (Class 1) a.4. Document and disseminate operational plans and schedules a.5. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the planning and scheduling of the operations of the power installations and auxiliary machinery on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the planning and scheduling of the operations of the power installations and auxiliary machinery on vessels of unlimited propulsion power d. Engineering project scheduling and planning methods including the use of GANTT charts and CPM / PERT network techniques e. Operational characteristics and performance specifications for the types of engines, propulsion plant and auxiliary machinery usually found on a vessel of unlimited propulsion power f. Procedures for the planning and scheduling of the operation of the power installations and auxiliary machinery on vessels of unlimited propulsion power ensure compliance with the operational instructions for the voyage, bridge orders, technical specifications, survey requirements and established safety rules and regulations g. The nature and causes of typical potential malfunctions and/or poor performance of engines, propulsion plant and auxiliary machinery h. Hazards and problems that can occur with power installations and auxiliary machinery during voyages of vessels of unlimited propulsion power and appropriate preventative and remedial action and solutions i. Safety, environmental and hazard control precautions and procedures relevant to the operation of the power installations and auxiliary machinery on vessels of unlimited propulsion power j. Operational and performance evaluation records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities k. Maritime communication techniques needed when planning and scheduling of the operation of the power installation and auxiliary machinery on a vessel of unlimited propulsion power l. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams m. Knowledge and ability to read and interpret material safety data sheets n. Principles and operational characteristics of internal combustion engines, including: <ul style="list-style-type: none"> n.1. two stroke and four stroke cycles n.2. optimum combustion parameters and their control n.3. diesel engine scavenging systems both in normal and emergency operation n.4. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised n.5. determination of shaft power n.6. irregularities in the performance of machinery and plant o. Methods of providing air for combustion

PLAN AND SCHEDULE OPERATIONS ON VESSELS OF 3,000 KW PROPULSION POWER OR MORE

- | | |
|---|--|
| <p>3. Required knowledge and skills
(continued)</p> | <ul style="list-style-type: none"> p. Theory and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including: <ul style="list-style-type: none"> p.1. plans for hazard reduction p.2. procedures for extinguishment of scavenge fires and dealing with crankcase mist detector alarm p.3. regaining of control after starting airline, crankcase and gearbox explosions q. Principles of fuel systems, including: <ul style="list-style-type: none"> q.1. typical injection pressures and viscosities for different grades of fuel q.2. alterations to fuel pumps, camshafts and injectors for varying fuel types q.3. differences between constant and variable injection timing of fuel q.4. injection requirements for different speeds of diesel engine q.5. common service faults, symptoms and causes of combustion problems and related solutions q.6. fuel line pulsation damping devices and leakage protection q.7. fuel valve cooling arrangements q.8. uni-fuel and dual fuel systems r. Principles of engine cooling and lubrication, including: <ul style="list-style-type: none"> r.1. different methods of diesel engine cooling r.2. need for treatment of engine cooling water r.3. methods of treating engine cooling water r.4. diesel engine lubrication requirements r.5. methods of lubricating diesel engine components r.6. theory and types of lubrication r.7. relative characteristics, and applications of mineral and synthetic oils r.8. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants r.9. common lubrication problems and their solution s. Principles of marine control systems, including <ul style="list-style-type: none"> s.1. common sensors and their associated transmitters s.2. analysis of control loops s.3. temperature and pressure control systems used onboard vessel s.4. methods of load-dependent cooling of diesel alternators on heavy fuel oils s.5. analysis of typical level control systems used onboard vessel s.6. operation and application of electronic PID controllers t. Procedures for the testing of boiler water, machinery cooling water and lubricating oil u. Principles of operation of hydraulic and electronic overspeed governors v. Principles and functions of machinery space monitoring and alarm systems including: <ul style="list-style-type: none"> v.1. central cooling and load dependent cooling control systems v.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control v.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis w. Principles of air-conditioning and refrigeration systems, including: <ul style="list-style-type: none"> w.1. principles of operation w.2. performance indicators w.3. characteristics, hazards and handling requirements of CFCs and HCFCs w.4. safety and environmental requirements associated with air-conditioning and refrigeration systems x. Principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including: <ul style="list-style-type: none"> x.1. heat transfer, including log mean temperature and circular pressure vessels x.2. gases x.3. gas cycles x.4. properties and expansion of steam x.5. steam cycles including a specific understanding of the use of entropy charts and modifications to the steam cycle x.6. boilers and evaporators x.7. steam turbines, including an understanding of isentropic efficiency x.8. combustion with a specific understanding of volumetric analysis x.9. refrigeration and air conditioning, including the use of entropy charts. |
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Evidence Guide (continued)

PLAN AND SCHEDULE OPERATIONS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<p>y. Principles and operational characteristics of steam turbines, gearing and associated equipment including:</p> <ul style="list-style-type: none"> y.1. lubrication y.2. gear configurations y.3. thrust blocks y.4. air ejectors y.5. determination of shaft power y.6. irregularities in the performance of machinery and plant <p>z. Principles and operational characteristics of main and auxiliary boilers and associated equipment including:</p> <ul style="list-style-type: none"> z.1. boiler water tests and treatment z.2. corrosion z.3. superheaters z.4. de-aerators z.5. open and closed feed systems z.6. uptake fires z.7. combustion arrangements z.8. others
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to plan and schedule the operations of the power installation and auxiliary machinery for the voyage of a vessel of unlimited propulsion power; and/or b. Plan and schedule the operations of vessel's power installation and auxiliary machinery for the voyage of a commercial or training vessel of unlimited propulsion power
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. planning and scheduling the operation of the power installation and auxiliary machinery for the voyage of a vessel of unlimited propulsion power a.2. complying with required safety, environmental and hazard control precautions and procedures when planning the operation of a vessel's power installation and auxiliary machinery a.3. identifying typical potential operational problems and hazards and developing appropriate contingency plans a.4. documenting and disseminating operational plans and schedules a.1 identifying and implementing improvements to procedures for the planning and scheduling the operations of vessel's power installation and auxiliary machinery b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the operation of a vessel's power installation and auxiliary machinery, including machinery specifications and directions on equipment capability and limitations b.4 waste, pollution and recycling management processes c. Work is managed, controlled and completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MR8 01A START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OF UNLIMITED PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to start up and shut down main propulsion and auxiliary machinery and associated systems on a commercial vessel powered by main propulsion machinery of unlimited propulsion power within the scope of responsibility of a Marine Engineer (Class 1). This includes the management and coordination of relevant operational activities and the application of advanced diagnostic and problem solving techniques to operational difficulties.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Organise the start up of main propulsion and auxiliary machinery</p>	<p>a. Method of preparing the start up of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions and established engineering practice</p> <p>b. Procedures for making available fuels, lubricants, cooling water, steam and air for the start up of main propulsion and auxiliary machinery are in accordance with manufacturers' specifications and instructions and established engineering practice</p> <p>c. Required precautions are taken prior to start up of main propulsion and auxiliary machinery to minimise and control hazards and operational risks</p> <p>d. Potential problems with the start up of main propulsion and auxiliary machinery are identified and investigated and appropriate action is initiated to rectify any problems that occur</p> <p>e. Advanced diagnostic techniques are used to investigate poor performance and faults and appropriate action is initiated to rectify the identified problems in accordance with the responsibilities of an Engineer (Class 1)</p>
<p>2. Start up and warm up main propulsion and auxiliary machinery</p>	<p>a. Main propulsion and auxiliary machinery is started up and warmed up in response to bridge orders in accordance with the scope of responsibility of an Engineer (Class 1)</p> <p>b. Checks of pressures, temperatures, and revolutions and other relevant parameters during the start up and warm up period of the operation of main propulsion and auxiliary machinery are made in accordance with manufacturers' technical specifications and agreed work plans</p> <p>c. Out of specification measures of pressures, temperatures, and revolutions during the start up and warm up period are investigated and appropriate action initiated to rectify any malfunctions or faults</p>
<p>3. Prepare the shut down of main propulsion and auxiliary machinery</p>	<p>a. Method of preparing the shut down of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions and established engineering practice</p> <p>b. Required precautions are taken prior to shut down of main propulsion and auxiliary machinery to minimise and control hazards and operational risks</p> <p>c. Potential problems with the shut down of main propulsion and auxiliary machinery are identified and investigated and appropriate action is initiated to report and rectify the problems in accordance with the scope of responsibility of an Engineer (Class 1)</p>
<p>4. Supervise the cooling down of the engine</p>	<p>a. The cooling down of the engine is supervised in accordance with manufacturers' specifications and instructions and established engineering practice</p>

5. **Follow safety and hazard control procedures**

- a. Start up and shut down hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment
- b. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during start up and shut down operations
- c. Where relevant, safety management procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed
- d. Action is taken in the event of a machinery failure or emergency during start up or shut down of main propulsion and auxiliary machinery to secure the machinery and the vessel and ensure the safety of the vessel and persons involved
- e. Shipboard emergency and contingency plans are correctly followed in the event of a machinery failure or emergency during start up or shut down of main propulsion and auxiliary machinery
- f. Vessel's internal communication system is used during warm through and shut down operations in accordance with established procedures

Range Of Variables

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the scope of responsibility of an Engineer (Class 1). c. Work involves the application of marine engineering practice to the start up and shut down of the main propulsion and auxiliary machinery and associated systems typically found on a vessel of unlimited propulsion power across a wide and often unpredictable variety of operational contexts. Contribution to the development and implementation of procedures for start up and shut down operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to the start up and shut down the main propulsion and auxiliary machinery and associated systems within the scope of responsibility of an Engineer (Class 1). This includes management, training and control of personnel, analysis of operational requirements, problem solving and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The main propulsion and auxiliary machinery and associated systems to be started up and shut down may include those typically found on an Australian or international commercial vessel of unlimited propulsion power b. The main propulsion and auxiliary machinery and associated systems may be started up and shut down <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. during berthing and unberthing operations b.4. while anchored or moored b.5. in dry dock b.6. during cargo operations b.7. when bunkering b.8. during cargo operations c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine plant and boiler c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. Auxiliary machinery and associated systems may include: <ul style="list-style-type: none"> d.1.1. fresh and salt water cooling systems d.1.2. lubricating oil cooling systems d.1.3. fuel, oil, gas, coal systems and centrifuges d.1.4. air compressor and air starting systems d.1.5. lubrication d.1.6. bilge and ballast system, oily water separator d.1.7. refrigeration and air-conditioning plant and equipment d.1.8. onboard air compressors and compressed air and control air systems d.1.9. waste management and pollution control systems as per the MARPOL Convention d.1.10. fresh water evaporators reverse osmosis systems d.1.11. inert gas generator d.1.12. cargo pumps, tank washing machines and associated systems d.1.13. purifiers and clarifiers d.1.14. heaters d.1.15. sewage plant d.1.16. fixed fire fighting installations and fire control systems d.1.17. auxiliary boilers and waste heat generators

Range Of Variables (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OF UNLIMITED PROPULSION POWER

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>e. Emergencies may include:</p> <ul style="list-style-type: none"> e.1. loss of propulsion e.2. loss of electrical power e.3. loss of steerage e.4. flooding e.5. fire or explosion e.6. loss of refrigeration e.7. loss of water making ability e.8. fuel oil, lubrication oil, steam and gas leaks e.9. overheating and overspeed of machinery, governors, emergency trips
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.4. maintenance log, running sheets and records, including computer database of running information and maintenance records where relevant a.5. vessel's survey as it relates to shipboard machinery a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery maintenance and repair a.7. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard machinery maintenance and repair on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Organise and control the start up and shut down the main propulsion and auxiliary machinery and associated systems within the scope of responsibility of an Engineer (Class 1) a.2. Identify problems and hazards with the start up and shut down the main propulsion and auxiliary machinery and associated and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when starting up and shutting down the main propulsion and auxiliary machinery and associated systems a.4. Communicate effectively with others during start up and shut down operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an Engineer (Class 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the start up and shut down of main and auxiliary machinery and associated systems on vessels of unlimited propulsion power b. Relevant OH&S legislation and policies c. Established engineering practice for the start up and shut down of main and auxiliary machinery and associated systems d. Operational characteristics and performance specifications for the different types of main and auxiliary machinery and associated systems usually found on a vessel e. Procedures for carrying out the start up and shut down of main and auxiliary machinery and associated systems to ensure compliance with the company and survey requirements and established safety rules and regulations f. The nature and causes of typical start up and shut down malfunctions of main and auxiliary machinery and associated systems and the available methods for their detection and rectification g. Safety, environmental and hazard control precautions and procedures relevant to the start up and shut down of main and auxiliary machinery and associated systems h. Principle features of vessel construction and principles of transverse and longitudinal stability i. A basic understanding of the properties and application of materials and structures typically used in the construction of a vessel of 3,000 kW power or more and its associated operational machinery j. Operational records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities k. Maritime communication techniques needed during the start up and shut down of main and auxiliary machinery and associated systems l. Knowledge and ability to read and interpret material safety data sheets m. Procedures for the testing of boiler water, machinery cooling water and lubricating oil n. Knowledge and ability to read and interpret machinery performance readings and indications o. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams p. Principles and operational characteristics of internal combustion engines, including: <ul style="list-style-type: none"> p.1. two stroke and four stroke cycles p.2. optimum combustion parameters and their control p.3. diesel engine scavenging systems both in normal and emergency operation p.4. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised

Evidence Guide (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OF UNLIMITED PROPULSION POWER

3. Required knowledge and skills
(continued)
- q. Principles of engine cooling and lubrication, including:
 - q.1. different methods of diesel engine cooling
 - q.2. need for treatment of engine cooling water
 - q.3. methods of treating engine cooling water
 - q.4. diesel engine lubrication requirements
 - q.5. methods of lubricating diesel engine components
 - q.6. theory and types of lubrication
 - q.7. relative characteristics, and applications of mineral and synthetic oils
 - q.8. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - q.9. common lubrication problems and their solution
 - r. Principles of operation of hydraulic and electronic overspeed governors
 - s. Principles of marine control systems, including
 - s.1. common sensors and their associated transmitters
 - s.2. analysis of control loops
 - s.3. temperature and pressure control systems used onboard vessel
 - s.4. methods of load-dependent cooling of diesel alternators on heavy fuel oils
 - s.5. analysis of typical level control systems used onboard vessel
 - s.6. operation and application of electronic PID controllers
 - t. Principles and functions of machinery space monitoring and alarm systems, including:
 - t.1. central cooling and load dependent cooling control systems
 - t.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control
 - t.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis
 - u. Theory and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including:
 - u.1. plans for hazard reduction
 - u.2. procedures for extinguishment of scavenge fires and dealing with crankcase mist detector alarm
 - u.3. regaining of control after starting airline, crankcase and gearbox explosions
 - v. Methods of providing air for combustion
 - w. Principles of operation of key auxiliary systems
 - x. Principles and procedures of machinery lubrication, including:
 - x.1. theory and types of lubrication
 - x.2. relative characteristics, and applications of mineral and synthetic oils
 - x.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - y. Principles and operational characteristics of steam turbines, gearing and associated equipment including:
 - y.1. lubrication
 - y.2. gear configurations
 - y.3. thrust blocks
 - y.4. air ejectors
 - y.5. determination of shaft power
 - y.6. irregularities in the performance of machinery and plant
 - z. Principles of fuel systems, including:
 - z.1. typical injection pressures and viscosities for different grades of fuel
 - z.2. alterations to fuel pumps, camshafts and injectors for varying fuel types
 - z.3. differences between constant and variable injection timing of fuel
 - z.4. injection requirements for different speeds of diesel engine
 - z.5. common service faults, symptoms and causes of combustion problems and related solutions
 - z.6. fuel line pulsation damping devices and leakage protection
 - z.7. fuel valve cooling arrangements
 - z.8. uni-fuel and dual fuel systems

Evidence Guide (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>3 Required knowledge and skills (continued)</p>	<p>aa. Principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery, including:</p> <ul style="list-style-type: none"> aa.1. statics (primarily non-concurrent systems) aa.2. friction aa.3. dynamics aa.4. balancing aa.5. simple harmonic motion aa.6. radial, circumferential and, longitudinal stress aa.7. strain energy aa.8. beam deflection aa.9. buckling and crippling loads and struts aa.10. combined stress, shear stress aa.11. fluid mechanics aa.12. losses in pipes, fittings and pumps aa.13. torsion, hollow and solid shafts aa.14. loads due liquid head aa.15. structural strength and vibration of vessels aa.16. gears including epicyclic gearing <p>bb. Principles of transverse and longitudinal stability and principles of naval architecture and vessel construction relevant to detection, identification and repair of faults, including:</p> <ul style="list-style-type: none"> bb.1. draught, trim and heel bb.2. forces on the rudder and stress in the rudder stock bb.3. propellers bb.4. structural strength and vibration of vessels bb.5. vessel measurement and classification bb.6. load line bb.7. stability calculations bb.8. free surface effects bb.9. dry docks bb.10. lifesaving equipment bb.11. hull repairs and maintenance <p>cc. Principles of thermodynamics and heat and heat engines relevant to detection, identification and repair of faults, including:</p> <ul style="list-style-type: none"> cc.1. heat transfer, including log mean temperature and circular pressure vessels cc.2. gases cc.3. gas cycles cc.4. properties and expansion of steam cc.5. steam cycles including a specific understanding of the use of entropy charts and modifications to the steam cycle cc.6. boilers and evaporators cc.7. steam turbines, including an understanding of isentropic efficiency cc.8. combustion with a specific understanding of volumetric analysis cc.9. refrigeration and air conditioning, including the use of entropy charts. <p>dd. Principles and operational characteristics of main and auxiliary boilers and associated equipment including:</p> <ul style="list-style-type: none"> dd.1. boiler operation in normal and emergency procedures dd.2. feed systems for marine boilers dd.3. various fittings mounted on boilers and their functions dd.4. boiler water tests and treatment dd.5. corrosion dd.6. superheaters dd.7. de-aerators dd.8. open and closed feed systems dd.9. uptake fires
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to start up and shut down the main propulsion and auxiliary machinery and associated systems typically found on a vessel of unlimited propulsion power; and/or b. Start up and shut down the propulsion and auxiliary machinery and associated systems in a range of operational situations on a commercial or training vessel of unlimited propulsion power

Evidence Guide (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OF UNLIMITED PROPULSION POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. managing the starting up and shutting down of the main propulsion and auxiliary machinery and associated systems a.2. identifying problems and hazards with the start up and shut down of the main propulsion and auxiliary machinery and associated systems and initiate appropriate action for rectification a.3. exercising all required safety, environmental and hazard control precautions and procedures when starting up and shutting down the main propulsion and auxiliary machinery and associated systems a.4. communicating effectively with others during start up and shut down operations a.5. identifying and implementing improvements to start up and shut down procedures a.6. applying safety precautions relevant to start up and shut down operations a.7. completing operational documentation and records <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on the start up and shut down of the main propulsion and auxiliary machinery and associated systems typically found on a vessel of unlimited propulsion power, including machinery specifications and directions on equipment capability and limitations b.4. following on-board housekeeping processes b.5. waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is managed, controlled and completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MR9 01A OPERATE ALTERNATORS, GENERATORS AND CONTROL SYSTEMS TO SUPPLY SHIPBOARD ELECTRICAL POWER

Field E Communications

DESCRIPTION:

This unit involves the skills and knowledge required to operate alternators, generators and control systems to supply shipboard electrical power on board a commercial vessel, including planning the operations of the plant and systems, operating the plant and systems, identifying malfunctions and taking appropriate action, exercising all required safety and pollution control measures, and keeping all required operational records.

The unit is consistent with the related functional standard in Section A III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate alternators, generators and control systems</p>	<ul style="list-style-type: none"> a. Maintain a safe engineering watch and operation of alternators, generators and control systems to supply shipboard electrical power are developed in accordance with operational instructions, vessel and company rules and procedures, and established marine engineering practice b. Alternators, generators and control systems are operated to supply shipboard electrical power within specified limits in accordance with established plans and procedures and manufacturer's instructions and specifications a. Alternators and generators are prepared, started, coupled and changed over in accordance with manufacturers' instructions and established marine engineering practice c. The performance of shipboard alternators, generators and control systems is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance d. Out-of-specification performance and faults are identified in consultation with a senior engineer and appropriate action initiated to report or rectify the problem in accordance with marine engineering practice and vessel's procedures e. Records of performance are maintained on running sheets and operations logs in accordance with vessel's procedures
<p>2. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precaution and regulations are followed when operating shipboard alternators, generators and associated control systems b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during the operation of alternators, generators and control systems d. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed e. Appropriate action is taken in the event of a failure or emergency associated with shipboard alternators, generators and control systems to isolate and secure the plant and equipment and the vessel and maintain the safety of the vessel and persons involved f. Shipboard emergency and contingency plans are followed in the event of a loss of shipboard electrical power caused by a failure or emergency associated with shipboard alternators, generators or control systems

Range Of Variables

OPERATE ALTERNATORS, GENERATORS AND CONTROL SYSTEMS TO SUPPLY SHIPBOARD ELECTRICAL POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed, in consultation with a senior engineer, relatively independently within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice to the operation of shipboard alternators, generators and control systems typically found on a vessel of unlimited propulsion power across a wide and often unpredictable variety of operational contexts. Monitoring and supervising the implementation of a broad plan or strategy for the operation of shipboard alternators, generators and control systems is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires some responsibility for overseeing the operation of alternators, generators and control systems to supply shipboard power. This includes supervision and control of personnel, hazard minimisation, analysis of performance and operational situations, and related decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Shipboard alternators, generators and control systems may include those typically found on any Australian or international commercial vessel of unlimited propulsion power b. Safe watchkeeping procedures and operation of shipboard electrical power distribution systems and electrical generation and related control equipment may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of electrical and electronic control equipment may include: <ul style="list-style-type: none"> c.1. Main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> c.1.1. Distribution circuits and wiring c.1.2. Protection devices c.1.3. circuit breakers c.2. three phase alternators c.3. a.c. generators c.4. three phase transformers c.5. a.c. and d.c. motors, including: <ul style="list-style-type: none"> c.5.1. three phase induction motors such as squirrel cage, double cage, wound rotor and slip ring, TEFC, splash proof and submersible c.5.2. three phase synchronous motors c.6. emergency supply systems including emergency generators, emergency switchboard and battery banks c.7. electrical and electronic equipment space monitoring alarm and control systems c.8. electronic instrumentation and power supply circuits c.9. electronic governors d. c.10 deck electrical machinery e. Operational hazards may include: <ul style="list-style-type: none"> e.1. moving and rotating electrical equipment e.2. using equipment beyond safe working limits e.3. poor housekeeping procedures e.4. non-compliance with safe working procedures e.5. hot pipes and valves (steam, fuel oil, lubricating oil) e.6. cold pipes and valves (refrigeration and liquefied gas cargoes) e.7. working at heights and in confined spaces e.8. dangerous atmosphere e.9. overspeed of electrical machinery, emergency trips e.10. noxious and dangerous cargoes e.11. electric shock

Range Of Variables (continued)

OPERATE ALTERNATORS, GENERATORS AND CONTROL SYSTEMS TO SUPPLY SHIPBOARD ELECTRICAL POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>f. Emergencies may include:</p> <ul style="list-style-type: none"> f.1. loss of electrical power f.2. short circuits and open-circuits in distribution systems f.3. loss of electronic / electrical control of systems f.4. flooding of engine room f.5. fire or explosion in engine room f.6. failure of emergency alarm and control systems f.7. loss of refrigeration f.8. overloading of electrical systems f.9. electric shock
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. power distribution system and electrical generation and control equipment running sheets, operations logs and other operational records, including computer database of running information, where relevant a.5. vessel's survey procedures and instructions as they relate to shipboard electrical and electronic equipment a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard electrical power distribution systems and electrical and electronic control equipment operation a.7. instructions of relevant Maritime Authorities and class societies concerning shipboard electrical power distribution systems and electrical and electronic control equipment operation
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard electrical power distribution systems and electrical power generation and electronic control equipment operation on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory electrical and electronic engineering practice standards

Evidence Guide

OPERATE ALTERNATORS, GENERATORS AND CONTROL SYSTEMS TO SUPPLY SHIPBOARD ELECTRICAL POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Ensure a safe engineering watch during the operation of shipboard electrical power distribution systems and electrical power generation and associated electronic control equipment a.2. Operate shipboard electrical power distribution systems and electrical power generation and associated electronic control equipment within specifications on a vessel of 3,000 kW propulsion power or more a.3. Prepare, start, synchronise and change over alternators and generators a.4. Identify malfunctioning power distribution systems and electrical generation and electronic control equipment and components and, in consultation with a senior engineer, initiate appropriate action for repair or replacement a.5. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation of electrical power distribution systems and electrical and electronic equipment a.6. Identify typical power distribution and electrical and electronic control equipment operational problems and hazards and take appropriate action a.7. Communicate effectively with others during operation of power distribution systems and electrical and electronic control equipment a.8. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an officer in charge of an engineering watch on a commercial vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation of shipboard electrical and electronic control equipment on vessels of unlimited propulsion power b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the operation of marine electrical and electronic equipment, systems and equipment d. Typical operational characteristics and performance specifications for the different types of shipboard electrical and electronic equipment usually found on a vessel of unlimited propulsion power e. The nature and causes of typical shipboard electrical and electronic equipment operational problems and the appropriate preventative and remedial action to be taken in each case f. A basic understanding of the power distribution and power generation systems typically used onboard a vessel of unlimited propulsion power and their associated operational electrical and electronic equipment g. Characteristics and application of shipboard electrical machines including: <ul style="list-style-type: none"> g.1. a.c. and d.c. motors g.2. a.c. generators including requirements for the parallel operation and the process of synchronisation g.3. three phase induction motors including the various starting methods g.4. three phase motors g.5. three phase synchronous motors g.6. three phase alternators operating singly and in parallel g.7. three phase transformers h. Safety, environmental and hazard control precautions and procedures relevant to the operation of shipboard electrical power distribution systems and electrical and electronic equipment i. Types of operations records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities j. Principles and procedures for electrical and electronic measurement, including the use of oscilloscopes and multimeters and insulation resistance measurement using a Megger k. Knowledge and ability to read and interpret electrical and electronic equipment performance readings and instrumentation l. Knowledge and ability to read and interpret Material Safety Data Sheets m. Knowledge and ability to read and interpret vessel and electrical and electronic equipment specifications, equipment drawings, operational manuals, and electrical and control circuit diagrams

Evidence Guide (continued)

OPERATE ALTERNATORS, GENERATORS AND CONTROL SYSTEMS TO SUPPLY SHIPBOARD ELECTRICAL POWER

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> n. Concepts of Unattended Machinery Spaces (UMSs) and automated monitoring and control of machinery o. Basic principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including: <ul style="list-style-type: none"> o.1. electromagnetism and electrostatics o.2. electrolytic action and cells o.3. the electric circuit o.4. AC and DC theory and electrical and electronic equipment o.5. cabling, distribution and lighting systems o.6. control and switch gear o.7. deck electrical and electronic equipment o.8. basic principles of electronics, integrated circuits and microprocessors o.9. basic principles of electronic control, surveillance, measurement and recording systems o.10. process control principles o.11. instruments, calibration and testing o.12. telemetering devices o.13. alarm systems o.14. main and auxiliary electrical and related electronic control equipment o.15. fire and emergency alarm systems p. Common active devices and their application in power electronic and electronic circuits typically used on a vessels of unlimited propulsion power, including: <ul style="list-style-type: none"> p.1. ability to identify the devices and their circuit symbols p.2. operating characteristics of common active devices p.3. applications of common active devices q. Common integrated circuit devices and their application in shipboard electronic instrumentation and power supply circuits, including: <ul style="list-style-type: none"> q.1. operational amplifiers q.2. voltage regulators q.3. multivibrators r. Maritime communication techniques needed when operating electrical power distribution systems and electrical and electronic equipment s. Safe procedures for the use of hand and power tools and instrumentation
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated operational situations and other assessments that demonstrate the skills and knowledge to operate electrical power distribution systems and electrical power generation and control equipment typically found on a vessel of unlimited propulsion power, and/or b. Maintain a safe engineering watch and operate shipboard electrical power distribution systems and electrical power generation and control equipment in a range of operational situations on a commercial or training vessel of unlimited propulsion power

Evidence Guide (continued)

OPERATE ALTERNATORS, GENERATORS AND CONTROL SYSTEMS TO SUPPLY SHIPBOARD ELECTRICAL POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 operating shipboard power distribution systems and electrical power generation and associated electronic control equipment</p> <p>a.2 assessing operational performance of shipboard power distribution systems and electrical power generation and associated electronic control equipment</p> <p>a.3 assist in the identification of operational problems with shipboard power distribution systems and electrical power generation and associated electronic control equipment and taking remedial action</p> <p>a.4 taking action, in consultation with a senior engineer, to minimise any damage and safety risk that could be caused by malfunctions in shipboard power distribution systems and electrical power generation and associated electronic control equipment</p> <p>a.5 applying safety precautions relevant to the operation of shipboard power distribution systems and power generation and associated electronic control equipment</p> <p>a.6 completing operations documentation and records</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders</p> <p>b.2 OHS regulations and hazard prevention policies and procedures</p> <p>b.3 ISM Code safety management system procedures, quality procedures and work instructions on the operation of shipboard power distribution systems and power generation and associated electronic control equipment, including system and equipment specifications and directions on systems and equipment capability and limitations</p> <p>b.4 following on-board housekeeping processes</p> <p>c. Action taken promptly to report and assist in the rectification of electrical and electronic equipment malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is managed, controlled and completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	3	2	2	3	3

TDM MR10 01A OPERATE PUMPING SYSTEMS AND ASSOCIATED CONTROL SYSTEMS

Field R Communications

DESCRIPTION:

This unit involves the skills and knowledge required to operate pumping systems and associated control systems on board a commercial vessel, including planning pumping systems operations, operating the systems, identifying malfunctions and taking appropriate action, exercising all required safety and pollution control measures, and keeping all required operational records.

The unit is consistent with the related functional standard in Section A III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate pumping systems and associated control systems</p>	<ul style="list-style-type: none"> a. Work plans for the operation of pumping systems and associated control systems are in accordance with established watchkeeping procedures, operational instructions, vessel and company rules, and established marine engineering practice b. Pumping systems and associated control systems are operated within specified limits in accordance with established plans and procedures and manufacturer's instructions and specifications c. The performance of shipboard pumping systems and associated control systems is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance d. Out-of-specification performance and faults are identified in consultation with a senior engineer and appropriate action initiated to report or rectify the problem in accordance with marine engineering practice and vessel's procedures e. Records of performance are maintained on running sheets and operations logs in accordance with vessel's procedures
<p>2. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required watchkeeping procedures, safety precautions and regulations are followed when operating pumping systems and associated control systems b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during the operation of pumping systems and associated control systems d. Where relevant and in consultation with a senior engineer, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed e. Appropriate action is taken in the event of a failure or emergency associated with shipboard pumping systems and associated control systems to isolate and secure the plant and equipment and the vessel and maintain the safety of the vessel and persons involved f. Shipboard emergency and contingency plans are followed in the event of a failure or emergency associated with shipboard pumping systems and associated control systems

Range Of Variables

OPERATE PUMPING SYSTEMS AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently in consultation with a senior engineer, within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice to the operation of shipboard pumping systems and associated control systems typically found on a vessel of unlimited propulsion power across a wide and often unpredictable variety of operational contexts. Monitoring and supervising the implementation of a broad plan or strategy for the operation of pumping systems and associated control systems is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires some responsibility for overseeing the operation of operation of pumping systems and associated control systems. This includes supervision and control of personnel, hazard minimisation, analysis of performance and operational situations and related decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The operation of pumping systems and associated control systems may be undertaken on an Australian or international commercial vessel of unlimited propulsion power b. Safe watchkeeping procedures and the operation of shipboard pumping systems and associated control systems may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. while in dry dock b.7. when bunkering b.8. during cargo operations c. Pumps and pumping systems may include: <ul style="list-style-type: none"> c.1.1. bilge pumping systems c.1.2. ballast pumping systems c.1.3. cargo pumping systems c.1.4. fuel and lubrication oil systems c.1.5. sea water and fresh water systems d. Potential hazards during operation of pumping systems and associated control systems may include: <ul style="list-style-type: none"> d.1. operating equipment beyond safe working limits d.2. moving and rotating machinery d.3. working in confined spaces d.4. faulty machinery equipment handling equipment and lifting gear d.5. non-compliance with safe working procedures d.6. hot pipes and valves (steam, fuel oil, lubricating oil) d.7. cold pipes and valves (refrigeration and liquefied gas cargoes) d.8. flammable liquids, vapours and fuel d.9. working at heights d.10. moving heavy loads in an unsafe work environment d.11. unsecured machinery, components or equipment d.12. slippery deck d.13. poor housekeeping procedures d.14. sharp tools and implements d.15. power tools d.16. dangerous atmosphere d.17. overspeed of electrical machinery, emergency trips d.18. noxious and dangerous cargoes

Range Of Variables (continued)

OPERATE PUMPING SYSTEMS AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
3. Worksite environment (continued)	e. Emergencies may include: <ul style="list-style-type: none"> e.1. loss of electrical power e.2. pump failure e.3. flooding of engine room e.4. fire or explosion in engine room e.5. fuel oil, lubrication oil, water, steam and gas leaks e.6. overheating and overspeed of machinery, governors, emergency trips e.7. electric shock
4. Sources of information / documents	a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned pumping systems, operational procedures and instructions a.3. pumping equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. pumping systems running sheets, operations logs and other operational records, including computer database of running information, where relevant a.5. vessel's survey procedures as they relate to shipboard pumping systems and associated control systems a.6. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard pumping systems and associated control systems operation a.7. instructions of relevant Maritime Authorities and class societies concerning shipboard pumping systems and associated control systems operation
5. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation of pumping systems and associated control systems on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

OPERATE PUMPING SYSTEMS AND ASSOCIATED CONTROL SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Ensure a safe engineering watch during the operation of pumping systems and associated control systems a.2. Operate shipboard pumping systems and associated control systems within specifications on a vessel of 3,0000 kW propulsion power or more a.3. Identify malfunctioning pumping systems and associated control systems and, in consultation with a senior engineer, initiate appropriate action for repair or replacement a.4. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation of pumping systems and associated control systems a.5. Identify, in consultation with a senior engineer, typical operational problems and hazards when operating pumping systems and associated control systems and take appropriate action a.6. Communicate effectively with others during operation of pumping systems and associated control systems a.7. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other engineering operations competency units that form part of the job role of an officer in charge of an engineering watch on a commercial vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation of pumping systems and associated control systems on vessels of unlimited propulsion power b. Established engineering practice and procedures for the operation of shipboard pumping systems and associated control systems in warm through, manoeuvring, start up, normal running, emergency and shut down situations c. Relevant safety, environmental and hazard control legislation, precautions and procedures relevant to the operation of pumping systems and associated control systems d. Operational characteristics and performance specifications for the different types of marine pumping systems and associated control systems usually found on a vessel of unlimited propulsion power e. Operating precautions for pumping systems and associated control systems to ensure operational performance is in compliance with the bridge orders, technical specifications, survey requirements and established safety and anti-pollution rules and regulations f. The nature and causes of typical malfunctions and/or poor performance pumping systems and associated control systems and the available methods for their detection and rectification g. Hazards and problems that can occur during the operation of pumping systems and associated control systems and appropriate preventative and remedial action and solutions h. Principles and functions of marine pumping systems, including <ul style="list-style-type: none"> h.1. typical pumping arrangements on a vessel h.2. different types of marine pumps, filters, purifiers, clarifiers and heat exchangers and their applications h.3. different types and locations of valves and safety fittings i. Elementary knowledge of marine control systems, including <ul style="list-style-type: none"> i.1. common sensors and their associated transmitters i.2. temperature and pressure control systems used onboard vessel i.3. analysis of typical level control systems used onboard vessel j. Operational and performance evaluation records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities k. Maritime communication techniques needed during the operation of pumping systems and associated control systems l. Knowledge and ability to read and interpret readings and indications of the performance of pumping systems and associated control systems m. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, operational manuals, specifications and electrical and control circuit diagrams n. Knowledge and ability to read and interpret material safety data sheets

Evidence Guide (continued)

OPERATE PUMPING SYSTEMS AND ASSOCIATED CONTROL SYSTEMS

3. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to operate shipboard pumping systems and associated control systems typically found on a vessel of unlimited propulsion power; and/or b. Maintain a safe engineering watch during the operation of shipboard pumping systems and associated control systems on a commercial or training vessel of unlimited propulsion power
4. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 maintaining a safe engineering watch involving the operation of shipboard pumping systems and associated control systems a.2 assessing operational performance of shipboard pumping systems and associated control system a.3 assisting a senior engineer in the identification of operational problems with shipboard pumping systems and associated control system and taking appropriate remedial action a.4 taking action, in consultation with a senior engineer, to minimise any damage and safety risk that could be caused by malfunctions in shipboard pumping systems and associated control system a.5 identifying and implementing improvements to procedures for the operation of shipboard power distribution systems and power generation and associated electronic control equipment a.6 applying safety precautions relevant to the operation of shipboard pumping systems and associated control systems a.7 completing operations documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures, quality procedures and work instructions on the operation of shipboard pumping systems and associated control systems, including system and equipment specifications and directions on systems and equipment capability and limitations b.4 following on-board housekeeping processes c. Action taken promptly to report and assist in the rectification of malfunctions in pumping systems and associated control systems, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
5. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	2	2	3	3

TDM MR11 01A OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

Field R Communications

DESCRIPTION:

This unit involves the skills and knowledge required to operate main and auxiliary machinery and associated systems on board a commercial vessel, including start up and shut down of main and auxiliary machinery and associated systems on a vessel powered by main propulsion machinery of unlimited propulsion power., identifying malfunctions and taking appropriate action, exercising all required safety and pollution control measures, and keeping all required operational records.

The unit is consistent with the related functional standard in Section A III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate main and auxiliary machinery and associated systems</p>	<ul style="list-style-type: none"> a. Work plans for the operation of main and auxiliary machinery and associated and auxiliary systems are in accordance with established watchkeeping procedures, operational instructions, vessel and company rules, and established marine engineering practice b. Method of preparing the start up of main and auxiliary machinery is in accordance with manufacturers' specifications and instructions and established engineering practice and shipboard procedures c. Procedures for making available fuels, lubricants, cooling water, steam and air for the start up of main and auxiliary machinery is in accordance with manufacturers' specifications and instructions and established engineering practice d. Required precautions are taken prior to start up of main propulsion and auxiliary machinery to minimise and control hazards and operational risks e. Main and auxiliary machinery and associated systems are operated within specified limits in accordance with established plans and procedures and manufacturer's instructions and specifications f. The performance of main and auxiliary machinery and associated systems is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance g. Malfunctions and deviations from performance norms are identified and appropriate action initiated to report or rectify the problem in accordance with marine engineering practice and vessel's procedures h. Records of performance are maintained on running sheets and operations logs in accordance with vessel's procedures
<p>2. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required watchkeeping procedures, safety precautions and regulations are followed when operating main and auxiliary machinery and associated systems b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during the operation of main and auxiliary machinery and associated systems d. Where relevant and in consultation with a senior engineer, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed e. Appropriate action is taken in the event of a failure or emergency associated with main and auxiliary machinery and associated systems to isolate and secure the plant and equipment and the vessel and maintain the safety of the vessel and persons involved f. Shipboard emergency and contingency plans are followed in the event of a failure or emergency associated with main and auxiliary machinery and associated systems

Range Of Variables

OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
<p>1. General context</p>	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently in consultation with a senior engineer, within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of marine engineering practice to the operation of main and auxiliary machinery and associated systems across a wide and often unpredictable variety of operational contexts. Monitoring and supervising the implementation of a broad plan or strategy for the operation of main and auxiliary machinery and associated systems is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires some responsibility for overseeing the operation of operation of shipboard main and auxiliary machinery and associated systems. This includes supervision and control of personnel, hazard minimisation, analysis of performance and operational situations and related decision making.
<p>2. Worksite environment</p>	<ul style="list-style-type: none"> a. The operation of shipboard main and auxiliary machinery and associated systems may be undertaken on an Australian or international commercial vessel of unlimited propulsion power b. Safe watchkeeping procedures and the operation of shipboard main and auxiliary machinery and associated systems may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. while in dry dock b.7. when bunkering b.8. during cargo operations c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam plant c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. main and auxiliary machinery and associated systems may include: <ul style="list-style-type: none"> d.1. steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls d.2. steam boilers d.3. steering gear, stabilizers, bow thrusters, rudders d.4. fluid power systems and controls d.5. pumps and pumping systems d.6. auxiliary systems and controls, including <ul style="list-style-type: none"> d.6.1. fresh and salt water cooling systems d.6.2. lubricating oil cooling systems d.6.3. fuel, oil, gas, coal systems and centrifuges d.6.4. air compressor and air starting systems d.6.5. lubrication d.6.6. onboard air compressors and compressed air and control air systems d.6.7. waste management and pollution control systems as per the MARPOL Convention d.6.8. sewage plant d.7. fixed fire fighting installations and fire control systems

Range Of Variables (continued)

OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>e. Potential hazards during operation of main and auxiliary machinery and associated systems may include:</p> <ul style="list-style-type: none"> e.1. operating equipment beyond safe working limits e.2. moving and rotating machinery e.3. working in confined spaces e.4. faulty machinery equipment handling equipment and lifting gear e.5. non-compliance with safe working procedures e.6. hot pipes and valves (steam, fuel oil, lubricating oil) e.7. cold pipes and valves (refrigeration and liquefied gas cargoes) e.8. flammable liquids, vapours and fuel e.9. working at heights e.10. moving heavy loads in an unsafe work environment e.11. unsecured machinery, components or equipment e.12. slippery deck e.13. poor housekeeping procedures e.14. sharp tools and implements e.15. power tools e.16. dangerous atmosphere e.17. overspeed of electrical machinery, emergency trips e.18. noxious and dangerous cargoes e.19. machinery overload <p>f. Emergencies may include:</p> <ul style="list-style-type: none"> f.1. loss of propulsion f.2. loss of steerage f.3. flooding of engine room f.4. fire or explosion in engine room f.5. loss of refrigeration f.6. loss of water making ability f.7. fuel oil, lubrication oil, steam and gas leaks f.8. loss of electrical power f.9. pump failure f.10. overheating and overspeed of machinery, governors, emergency trips f.11. electric shock
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned pumping systems, operational procedures and instructions a.3. pumping equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. pumping systems running sheets, operations logs and other operational records, including computer database of running information, where relevant a.5. vessel's survey procedures and instructions as they relate to shipboard main and auxiliary machinery and associated systems a.6. vessel's safety and emergency contingency plans and procedures a.7. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard main and auxiliary machinery and associated systems operation a.8. instructions of relevant Maritime Authorities and class societies concerning shipboard main and auxiliary machinery and associated systems operation
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation of main and auxiliary machinery and associated systems on vessels of unlimited propulsion power a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Ensure a safe engineering watch during the operation of main and auxiliary machinery and associated systems a.2. Operate shipboard main and auxiliary machinery and associated control systems within specifications on a vessel of 3,0000 kW propulsion power or more a.3. Identify malfunctioning main and auxiliary machinery and associated control systems and, in consultation with a senior engineer, initiate appropriate action for repair or replacement a.4. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation of main and auxiliary machinery and associated systems a.5. Identify typical operational problems and hazards when operating main and auxiliary machinery and associated control systems and take appropriate action a.6. Communicate effectively with others during operation of main and auxiliary machinery a.7. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an officer in charge of an engineering watch on a vessel of unlimited propulsion power.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation of main and auxiliary machinery and associated control systems on vessels of unlimited propulsion power b. Established engineering practice and procedures for the operation of shipboard main and auxiliary machinery and associated control systems in warm through, manoeuvring, start up, normal running, emergency and shut down situations c. Typical operational characteristics and performance specifications for the different types of marine main and auxiliary machinery and associated control systems usually found on a vessel of unlimited propulsion power d. Elementary principles of internal combustion engine cycles, including: <ul style="list-style-type: none"> d.1. the operating principles of two stroke and four stroke internal combustion engines d.2. the Otto, Diesel and Dual combustion cycles d.3. Methods for calculating mean effective pressure using an indicator diagram d.4. the indicated power formula d.5. specific fuel consumption and thermal efficiency d.6. the ideal cycle and air standard efficiency d.7. the effects of insufficient, minimum and excess air on combustion e. The operating cycle of refrigeration and related problems on refrigeration plant performance, including: <ul style="list-style-type: none"> e.1. the principles of refrigeration e.2. the refrigeration cycle as a pressure/enthalpy diagram e.3. the properties of refrigerants used in refrigeration plants e.4. refrigeration effect and plant capacity f. The psychrometric chart and the cycle of operation and working principles of air conditioning plants, including the meaning of psychrometric terms such as relative humidity dry and wet bulb temperatures g. The types, properties, tests, applications and treatment of fuels, lubricants, and solvents/chemicals used on board vessel, including a basic understanding of the working principles, construction, maintenance and safe operation of centrifuges, filters, and other treatment devices h. Basic principles of operation of boilers and steam systems, including: <ul style="list-style-type: none"> h.1. understanding of how combustion occurs in a boiler, and related safety procedures, including the importance of purging a boiler and other safety precautions taken when firing a boiler h.2. principles of boiler operation in normal and emergency situations h.3. typical feed systems for marine boilers, including all components normally found in such systems h.4. a basic understanding of the various fittings mounted on boilers, including: <ul style="list-style-type: none"> h.4.1. the common operating routines of local water level indicators, including methods of blowing a gauge glass, clearing blockages, and overhaul of these devices h.4.2. the effects of blockages in the water, steam and drain cocks of water level indicators h.5. how a boiler is flashed up from cold and put in line h.6. the purpose of all alarms and shut downs incorporated in a marine boiler h.7. typical configurations of, and describe the operating principles applying to, the various steam distribution systems found aboard vessel h.8. the checks which should be made regularly during routine turbine operation

Evidence Guide (continued)

OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

3. Required knowledge and skills
(continued)
- i. The nature and causes of typical malfunctions and/or poor performance main and auxiliary machinery and associated control systems and the available methods for their detection and rectification
 - j. Basic principles of operation of turbine systems and auxiliary steam plant, including:
 - j.1. the methods of turbine control, including safety devices
 - j.2. the symptoms, causes, effects, and actions to be taken of defects of auxiliary steam turbines
 - j.3. the construction and operation of auxiliary steam turbines
 - j.4. procedures for emergency operation of a steam turbine
 - j.5. methods of lubricating the principle components of a marine steam turbine and its associated gearing, and evaluate common faults including common lubrication faults, symptoms, causes, and actions to be taken with such faults
 - k. Types of operational and performance evaluation records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities
 - l. Maritime communication techniques needed during the operation of main and auxiliary machinery and associated systems
 - m. Knowledge and ability to read and interpret readings and indications of the performance of main and auxiliary machinery and associated systems
 - n. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, operational manuals, specifications and electrical and control circuit diagrams
 - o. Knowledge and ability to read and interpret material safety data sheets
 - p. Basic principles of diesel engine to a level suitable for a Watchkeeper Engineer, including
 - p.1. typical starting air and manoeuvring systems of diesel engines, including all components normally found therein:
 - p.1.1. starting methods of marine diesel engines and how propulsion manoeuvring is achieved
 - p.1.2. requirements for diesel engines for propulsion, power generation, and emergency use.
 - p.1.3. methods of reversing direct reversing engines with their interlocks and other safety arrangements.
 - p.1.4. common faults and appropriate action to be taken with starting/manoeuvring systems.
 - p.2. typical diesel engine lubrication systems, including:
 - p.2.1. all components normally found therein
 - p.2.2. normal operational pressures and temperatures which should be expected.
 - p.2.3. methods of lubricating the principle components of a marine diesel engine, with its associated gearing and/or chain drives, including common lubrication faults, symptoms, causes, and actions to be taken with such faults.
 - p.3. the operating principles and adjustments of diesel engine fuel injection equipment, including common service faults, symptoms, and causes of diesel fuel injection problems, explaining appropriate actions to be taken.
 - p.4. means of pressure charging diesel engines including common service faults and give appropriate actions to these faults and emergency operation and isolation procedures.
 - p.5. different methods of cooling marine diesel engines, including common requirements of cooling.
 - p.6. common faults and appropriate action to be taken with cooling of diesel engines.
 - p.7. the causes of crankcase and airline explosions, scavenge and uptake fires.
 - q. The causes, symptoms, means of preventing, detecting, and extinguishing fires and the correct procedures to be taken upon their detection, including:
 - q.1. scavenge fires.
 - q.2. crankcase explosions in both diesel and dual fuel engines.
 - q.3. starting airline explosions.
 - q.4. the risks of continued service with an isolated waste heat unit.
 - r. Relevant safety, environmental and hazard control legislation, precautions and procedures relevant to the operation of main and auxiliary machinery and associated systems
 - s. Typical operating precautions for main and auxiliary machinery and associated control systems to ensure operational performance is in compliance with the bridge orders, technical specifications, survey requirements and established safety and anti-pollution rules and regulations. Main and auxiliary machinery monitoring and protection devices.
 - t. Hazards and problems that can occur during the operation of main and auxiliary machinery and associated control systems and appropriate preventative and remedial action and solutions

Evidence Guide (continued)

OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none">u. Basic thermodynamics as it relates to the responsibilities of an officer on the engineering watch, including:<ul style="list-style-type: none">u.1. basic thermodynamic properties of common working fluids.u.2. methods of heat transfer and related problemsu.3. principles of heat transfer by conduction, convection and radiation and their application to marine systemsu.4. elementary principles of steam plantsu.5. saturated dry and wet steam, dryness fraction, superheated steam, enthalpy, steam tables. Evaporation.u.6. basic steam plant cycles and explain the function of each componentu.7. the combustion process and the calorific value of fuelsu.8. AIR/FUEL ratio and the significance of excess air on combustionu.9. the operating cycle of single stage reciprocating air conditioners including methods for calculating the mass of air deliveredu.10. clearance volume, its effect on volumetric efficiency and methods of calculating the volumetric efficiencyu.11. advantages of multistaging and intercoolingu.12. meaning of gauge and absolute pressureu.13. temperature and temperature scalesu.14. SYSTEM INTERNATIONAL (SI) units and common thermodynamic terms and principles.v. Compression and expansion of gases, including Gas laws., Boyle's Law, Charles Law, characteristic gas equation, gas constant, isothermal, adiabatic and polytropic processes, and specific heat capacity.w. Basic principles of mechanics as they relate to machine operation, including:<ul style="list-style-type: none">w.1. statics. force as a vector. triangle and polygon of forces. the principle of moments, application to simply supported beams and cranked levers. moments of force. couples. centroids and centres of gravity limited to geometrical shapes. resultant and equilibrant of a system of concurrent coplanar forces.w.2. laws of friction for dry surfaces. coefficient of friction (horizontal plane only). lubrication of bearings and plain surfaces.w.3. linear displacement, time speed, velocity and acceleration. angular motion.w.4. problems with constant force or force with linear variation. torque, work, energy, power. conservation of energy. potential and kinematic energy. newton's laws of motion. momentum, rate of change of momentum. centrifugal force.w.5. simple lifting machines. graphs of load-effort and load-efficiency. linear law. velocity ratio, mechanical advantage and efficiency of the following machines: wheel and axle, differential pulley blocks, screw jack, warwick screw, hydraulic jack, worm driven chain blocks and single and double purchase crab winches. reduction gearing.w.6. direct stress and strain. hooke's law. modulus of elasticity. elastic limit. ultimate tensile strength. yield stress. limit of proportionality. safety factor. shear stress.w.7. circumferential and longitudinal stress in thin cylindrical and spherical shells subject to internal pressure.x. Basic principles of naval architecture<ul style="list-style-type: none">x.1. transverse stability. elementary treatment of transverse stability. shift of centre of gravity due to addition, removal, or transfer of masses. qualitative treatment of free surface affect, water accumulation and their effect on stability.x.2. structural strength. variation of fluid pressure with depth. loading due to head of liquid.x.3. vessel construction. common terms used in the measurement of steel vessels. definitions of shipbuilding terms in general use. types of vessels. precautions necessary before entering empty oil fuel or ballast tanks.
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none">a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to operate main and auxiliary machinery and associated control systems typically found on a vessel of unlimited propulsion power; and/orb. Maintain a safe engineering watch during the operation of main and auxiliary machinery and associated control systems in a range of operational situations on a commercial or training vessel of unlimited propulsion power

Evidence Guide (continued)

OPERATE MAIN AND AUXILIARY MACHINERY AND ASSOCIATED CONTROL SYSTEMS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 maintaining a safe engineering watch involving the operation of main and auxiliary machinery and associated systems a.2 assessing operational performance of main and auxiliary machinery and associated system a.3 assisting in the identification of operational problems with main and auxiliary machinery and associated system and taking remedial action a.4 taking action, in consultation with a senior engineer, to minimise any damage and safety risk that could be caused by malfunctions in main and auxiliary machinery and associated system a.5 identifying and implementing improvements to procedures for the operation of main and auxiliary machinery and associated systems a.6 applying safety precautions relevant to the operation of main and auxiliary machinery and associated system a.7 completing operations documentation and records <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures, quality procedures and work instructions on the operation of main and auxiliary machinery and associated systems, including system and equipment specifications and directions on systems and equipment capability and limitations b.4 following on-board housekeeping processes <p>c. Action taken promptly to report and assist in the rectification of malfunctions in main and auxiliary machinery and associated systems, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is managed, controlled and completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	2	2	3	3

TDM MR13 01A OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OVER 750 KW PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate electrical machinery and electronic control machinery and equipment within the limits of responsibility of a Marine Engineer (Class 2).

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate electrical machinery and electronic control equipment</p>	<p>a. Shipboard electrical machinery and electronic equipment is managed and operated within the limits of responsibility of an Engineer (Class 2)</p> <p>b. The performance of shipboard electrical machinery and electronic equipment is monitored in accordance with vessel's survey requirements and manufacturer's instructions</p> <p>c. Poor performance and faults are identified and appropriate action initiated to report or rectify the problem in accordance with marine engineering practice and vessel's procedures</p> <p>d. Records of performance are maintained in accordance with vessel's procedures</p>
<p>2. Follow safety and hazard control procedures</p>	<p>a. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during the operation of electrical machinery and electrical and electronic control equipment</p> <p>b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment</p> <p>c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed</p> <p>d. Appropriate action is taken in the event of an electrical and/or electronic equipment failure or emergency to isolate and secure the electrical and electronic equipment and the vessel and maintain the safety of the vessel and persons involved</p> <p>e. Shipboard emergency and contingency plans followed in the event of a electrical and electronic equipment failure or emergency</p>

Range Of Variables

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of marine engineering practice to the operation of electrical machinery and electronic control equipment typically found on a vessels of 750 kW propulsion power or more across a wide and often unpredictable variety of contexts. Contribution to the development and implementation of a broad plan or strategy for the operation of shipboard electrical and electronic control equipment is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires judgement in planning, engineering and leadership functions related to the operation of electrical and electronic control equipment within the limits of responsibility of an Engineer (Class 2) . This includes management, hazard minimisation, analysis of situations and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Shipboard electrical machinery and electrical and electronic control equipment may include that typically found on any Australian or international commercial vessel between 750 and 3,000 kW propulsion power (when performing as Chief Engineer), and unlimited propulsion power (when performing as a Second Engineer) b. Operation of shipboard electrical machinery and electronic control equipment may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Types of electrical machinery and electronic control equipment may include but are not limited to: <ul style="list-style-type: none"> c.1. programmable logic controllers (PLCs) c.2. signal transmission systems used for monitoring and control c.3. temperature and pressure sensors c.4. electronic PID controllers c.5. analog to digital converters c.6. electrical and electronic equipment space monitoring alarm and control systems c.7. a.c. generators c.8. a.c. and d.c. motors, including three phase induction and three phase synchronous motors c.9. three phase alternators c.10. three phase transformers c.11. electronic instrumentation and power supply circuits c.12. main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> c.12.1. distribution circuits and wiring c.12.2. protection devices c.12.3. circuit breakers c.13. emergency supply systems including emergency generators, emergency switchboard and battery banks c.14. electronic governors c.15. deck electrical machinery

Range Of Variables (continued)

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>d. Operational hazards may include:</p> <ul style="list-style-type: none"> d.1. moving and rotating electrical and electronic equipment d.2. using equipment beyond safe working limits d.3. poor housekeeping procedures d.4. non-compliance with safe working procedures d.5. hot pipes and valves (steam, fuel oil, lubricating oil) d.6. cold pipes and valves (refrigeration and liquefied gas cargoes) d.7. working at heights d.8. dangerous atmosphere d.9. overspeed of electrical machinery, emergency trips d.10. noxious and dangerous cargoes d.11. electric shock <p>e. Emergencies may include:</p> <ul style="list-style-type: none"> e.1. loss of electrical power e.2. short circuits and open-circuits in distribution systems e.3. loss of electronic / electrical control of systems e.4. flooding of engine room e.5. fire or explosion in engine room e.6. failure of emergency alarm and control systems e.7. loss of refrigeration e.8. overloading of electrical systems e.9. electric shock
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.4. electrical and electronic equipment running sheets, operations logs and other operational records and/or computer database of running information a.5. vessel's survey procedures and instructions as they relate to shipboard electrical and electronic equipment a.6. vessel's safety and emergency contingency plans and procedures a.7. electrical and electronic equipment and vessel manufacturer's specifications, instructions and recommended procedures a.8. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard electrical and electronic control equipment operation a.9. instructions of relevant Maritime Authorities and class societies concerning shipboard electrical and electronic control equipment operation
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of relevant national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard electrical and electronic control equipment operation on commercial vessels a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory electrical and electronic engineering practice standards

Evidence Guide

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate shipboard electrical and electronic equipment against specifications on a vessel of unlimited propulsion power (as a second engineer) and between 750 and 3,000 kW (as a chief engineer) a.2. Identify malfunctioning and faulty electrical and electronic equipment and components and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation of shipboard electrical and electronic equipment a.4. Identify typical electrical machinery and electronic control equipment operational problems and hazards and take appropriate action a.5. Communicate effectively with others during operation of electrical and electronic control equipment including effective use of internal communication systems a.6. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation of shipboard electrical and electronic control equipment on vessels of 750 kW propulsion power or more b. Relevant OH&S legislation, policies and procedures c. Established engineering practice for the operation of marine electrical machinery and electronic equipment, systems and equipment d. Typical operational characteristics and performance specifications for the different types of shipboard electrical and electronic equipment usually found on a vessel of 750 kW propulsion power or more e. The nature and causes of typical shipboard electrical and electronic equipment operational problems and the appropriate preventative and remedial action to be taken in each case f. A knowledge of the power distribution and control circuits typically used onboard a vessel between 750 and 3,000 kW propulsion power and their associated operational electrical and electronic equipment g. Principles of electrotechnology, marine electrical practice and marine automation and control relevant to detection, identification and repair of faults, including: <ul style="list-style-type: none"> g.1. electromagnetism and electrostatics g.2. electrolytic action and cells g.3. the electric circuit g.4. principles and practical characteristics of AC and DC machines and related electrical and electronic control equipment g.5. cabling, distribution and lighting systems g.6. control and switch gear g.7. deck electrical and electronic equipment g.8. principles of operation of shipboard electronic components and systems, including: <ul style="list-style-type: none"> g.8.1. electronics principles g.8.2. integrated circuits g.8.3. microprocessors, g.8.4. PLCs g.8.5. process control theory g.8.6. instruments, calibration and testing g.8.7. electronic control, surveillance, measurement and recording systems g.8.8. telemetering devices g.8.9. alarm systems, including fire and emergency alarm systems g.8.10. main and auxiliary machinery control and UMS. g.9. principles of 2 and 3 term controllers h. Principles and procedures for electrical and electronic measurement, including the use of oscilloscopes and multimeters and insulation resistance measurement using a Megger i. Knowledge and ability to read and interpret electrical and electronic equipment performance readings and instrumentation

Evidence Guide (continued)

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OVER 750 KW PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none">j. Knowledge and ability to read and interpret Material Safety Data Sheetsk. Knowledge and ability to read and interpret vessel and electrical and electronic equipment specifications, equipment drawings, operational manuals, and electrical and control circuit diagramsl. Concepts of Unmanned Machinery Spaces (UMS) and automated monitoring and control of machinerym. Practical characteristics and application of shipboard electrical machines including:<ul style="list-style-type: none">m.1. a.c. and d.c. motorsm.2. a.c. generators including requirements for the parallel operation and the process of synchronisationm.3. three phase induction motors including the various starting methodsm.4. three phase motorsm.5. three phase synchronous motorsm.6. three phase alternators operating singly and in parallelm.7. three phase transformersn. Common active devices and their application in power electronic and electronic circuits typically used on a vessels of 750 kW propulsion power or more, including:<ul style="list-style-type: none">n.1. ability to identify the devices and their circuit symbolsn.2. operating characteristics of common active devicesn.3. applications of common active deviceso. Common integrated circuit devices and their application in shipboard electronic instrumentation and power supply circuits, including:<ul style="list-style-type: none">o.1. operational amplifierso.2. voltage regulatorso.3. multivibratorsp. Common digital electronic circuits and their application in shipboard electronic instrumentation systems, including:<ul style="list-style-type: none">p.1. digital integrated circuitsp.2. analog to digital convertersp.3. microprocessorsp.4. digital communication bus transmission system using optical and electronic sub-systemsq. Procedures for identifying faults and carrying out basic repairs on 4 to 20 mA loops including:<ul style="list-style-type: none">q.1. open and short circuitsq.2. earth faultsq.3. high resistance jointsq.4. power supply faultsq.5. electronic component failurer. Principles and applications of programmable logic controllers (PLCs)s. Types of operational records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authoritiest. Maritime communication techniques needed when operating electrical and electronic equipmentu. Safety, environmental and hazard control precautions and procedures relevant to the operation of shipboard electrical and electronic equipmentv. Safe procedures for the use of hand and power tools and maintenance equipment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none">a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated operational situations and other assessments that demonstrate the skills and knowledge to operate electrical and electronic equipment typically found on a vessel of 750 kW propulsion power or more; and/orb. Operate shipboard electrical machinery and electronic equipment in a range of operational situations on a commercial or training vessel of 750 kW propulsion power or more.

Evidence Guide (continued)

OPERATE ELECTRICAL MACHINERY AND ELECTRONIC CONTROL EQUIPMENT ON VESSELS OVER 750 KW PROPULSION POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 operating shipboard electrical machinery and electronic equipment</p> <p>a.2 assessing operational performance of shipboard electrical machinery and electronic equipment</p> <p>a.3 identifying operational problems with shipboard electrical machinery and electronic equipment and taking remedial action</p> <p>a.4 taking action to minimise any damage and safety risk that could be caused by electrical machinery and electronic equipment malfunctions</p> <p>a.5 identifying and implementing improvements to procedures for the operation of shipboard electrical machinery and electronic control equipment</p> <p>a.6 applying safety precautions relevant to the operation of shipboard electrical machinery and electronic control equipment</p> <p>a.7 completing operations documentation and records</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders</p> <p>b.2 OHS regulations and hazard prevention policies and procedures</p> <p>b.3 ISM Code safety management system procedures, quality procedures and work instructions on the operation of shipboard electrical machinery and electronic control equipment, including electrical and electronic equipment specifications and directions on equipment capability and limitations</p> <p>b.4 following on-board housekeeping processes</p> <p>c. Action taken promptly to report and/or rectify electrical machinery and electrical and electronic equipment malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	3	3	3

TDM MR14 01A MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES
ON VESSELS OVER 750 KW PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to manage fuel, bilge and ballast operations within the limits of responsibility of a Marine Engineer (Class 2) on a commercial vessel powered by main propulsion machinery of 750 kW propulsion power or above.

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
1. Carry out fuel and ballast operations	<ul style="list-style-type: none"> a. Fuel and ballast operations are completed in accordance with vessel's procedures and machinery and equipment manufacturer's instructions and specifications b. The performance of machinery and equipment used in fuel and ballast operations is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance c. Out of specification performance and faults are identified and appropriate action initiated to report or rectify the problem in accordance with marine engineering practice and vessel's procedures d. Records of performance of machinery and equipment used in fuel and ballast operations are maintained on running sheets and operations logs in accordance with established procedures
2. Carry out preventative maintenance of machinery and equipment used in fuel and ballast operations	<ul style="list-style-type: none"> a. Preventative maintenance measures for machinery and equipment used in fuel and ballast operations are carried out in accordance with the limits of responsibility of an Engineer (Class 2) b. Identified faults in machinery and equipment used in fuel and ballast operations are investigated using established fault-finding techniques in accordance with the limits of responsibility of an Engineer (Class 2) c. Decisions are made to carry out temporary or permanent repairs depending on the vessel's position and circumstances within the limits of responsibility of an Engineer (Class 2) d. Appropriate consultation is taken with class society and marine administration concerning the nature of the repairs and any contingency or emergency action required e. Management of the maintenance processes and the organisation and control of engine room personnel to facilitate repairs is in accordance with the limits of responsibility of an Engineer (Class 2)

<p>3. Carry out repairs on machinery and equipment used in fuel and ballast operations</p>	<ul style="list-style-type: none"> a. Malfunctioning or faulty machinery or equipment used for fuel and ballast operation is correctly shut down, and disassembled, if necessary, in accordance with manufacturer's instructions, company procedures and established marine engineering practice b. Damaged or faulty components are repaired or replaced in accordance with the limits of responsibility of an Engineer (Class 2) c. Repaired machinery is re-assembled in accordance with manufacturer's instructions, company procedures and established marine engineering practice d. Repaired machinery is tested and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel e. Performance of repaired machinery and associated safety devices, control systems and alarms is tested in accordance with manufacturer's instructions f. Performance against recommended performance specifications is confirmed and the machinery is re-commissioned in accordance with vessel's procedures
<p>4. Complete operational and maintenance and repair documentation</p>	<ul style="list-style-type: none"> a. Correct records are kept relating to fuel and ballast operations and machinery failure incidents b. All planned maintenance system and repair documentation is completed in accordance with survey and company requirements and regulations
<p>5. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Operational hazards for fuel and ballast operations are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment b. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during fuel and ballast operations c. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed d. Action is taken, in the event of a machinery failure or emergency to secure the machinery and the vessel and maintain the safety of the vessel and persons involved and shipboard emergency and contingency plans followed e. Personnel are trained and organised to implement shipboard emergency and contingency plans in the event of a machinery failure or emergency

Range Of Variables

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of marine engineering practice to the management of fuel and ballast operations on a vessel of 750 kW propulsion power and more across a wide and often unpredictable variety of contexts. Contribution to the development and implementation of a broad plan or strategy for the management of fuel and ballast operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to fuel and ballast operations within the limits of responsibility of an Engineer (Class 2). This includes management, training and control of personnel, analysis of the situation and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Fuel and ballast operations may be managed on an Australian or international commercial vessel of 750 kW propulsion power or more b. Fuel and ballast operations may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. while anchored or moored b.5. when bunkering b.6. during cargo operations c. Types of machinery may include:: <ul style="list-style-type: none"> c.1. pumps and pumping systems c.2. auxiliary systems and controls, including <ul style="list-style-type: none"> c.2.1. fuel, oil, gas, coal c.2.2. bilge and ballast system, oily water separator c.2.3. waste management and pollution control systems as per the MARPOL Convention c.2.4. cargo pumps, tank washing machines and associated systems d. Testing and repair equipment may include: <ul style="list-style-type: none"> d.1. meters and gauges, oxygen meter and gas detectors d.2. computer displays of performance parameters d.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. d.4. greasing and lubrication tools d.5. electric power tools, such as grinders, lathes, drills, etc. d.6. pneumatic power tools, such as grinders, sanders, drills, etc. d.7. welding equipment d.8. block and tackle and portable and manual lifting equipment and hydraulic jacks d.9. material safety data sheets d.10. protective clothing and equipment such as: <ul style="list-style-type: none"> d.10.1. eye and ear protection d.10.2. safety boots and helmet d.10.3. dust and fume masks d.10.4. boilersuit/overall e. Emergencies may include: <ul style="list-style-type: none"> e.1. flooding e.2. fire or explosion e.3. fuel oil, lubrication oil, steam and gas leaks e.4. overheating and overspeed of machinery, governors, emergency trips e.5. dangerous atmosphere e.6. fuel spills and overfilling of tanks

Range Of Variables (continued)

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>f. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> f.1. moving heavy loads in an unsafe work environment f.2. unsecured machinery, components or repair equipment f.3. slippery deck f.4. welding equipment f.5. sharp tools and implements f.6. power tools f.7. moving and rotating machinery f.8. flammable liquids, vapours and fuel f.9. faulty machinery equipment handling equipment and lifting gear f.10. using equipment beyond safe working limits f.11. poor housekeeping procedures f.12. non-compliance with safe working procedures f.13. hot pipes and valves (steam, fuel oil, lubricating oil) f.14. cold pipes and valves (refrigeration and liquefied)
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.4. maintenance log, running sheets and records including computer database of running information and maintenance records where relevant a.5. vessel's survey as it relates to shipboard machinery a.6. vessel's survey procedures and instructions as they relate to shipboard machinery used in fuel, bilge and ballast operations a.7. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery operation, maintenance and repair a.8. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery operation, maintenance and repair
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard machinery operation, maintenance and repair on vessels of 750 kW propulsion power and more a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carry out fuel, bilge and ballast operations on a vessel within the scope of responsibility of an Engineer (Class 2) a.2. Identify malfunctioning and faulty machinery and equipment used in fuel, bilge and ballast operations and components and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing fuel, bilge and ballast operations and related maintenance a.4. Identify typical operational problems and hazards when carrying out fuel, bilge and ballast operations and take appropriate action within the scope of responsibility of an Engineer (Class 2) a.5. Communicate effectively with others during fuel, bilge and ballast operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the management of fuel and ballast operations b. Relevant OH&S and anti-pollution legislation and policies c. Established engineering practice for the management of fuel, bilge and ballast operations including pollution control measures and the maintenance of related machinery, systems and equipment d. Operational characteristics and performance specifications for the different types of shipboard machinery and equipment used in fuel, bilge and ballast operations e. Procedures for carrying out shipboard machinery testing, trouble-shooting and repair as part of routine maintenance procedures to ensure compliance with the company and survey requirements and established safety rules and regulations f. Planned maintenance systems and procedures for the performance monitoring of machinery and equipment used in fuel, bilge and ballast operations including responsibilities and requirements covered by various forms of vessel survey g. The nature and causes of typical fuel, bilge and ballast operational problems and the available methods for their identification and rectification, including machinery malfunction fault-finding techniques h. Fuel, bilge and ballast operational hazards and problems and appropriate preventative and remedial action and solutions i. Procedures for the shipboard treatment of fuel and lubricating oils, including: <ul style="list-style-type: none"> i.1. bunkering procedures and arrangements i.2. the use and operation of centrifugal separators i.3. the function and operation of a shipboard fuel blender and alternative fuel treatments j. Causes and effects of fuel and lubricating oil contamination and ways and means of controlling such contamination, including the sampling and testing of oil k. Procedures for assessing the performance of different fuel and ballast pumping systems and their components l. Operational problems that occur with pumps and pumping systems handling sea water and action that can be taken to minimise or rectify these problems m. Properties and characteristics of liquids, fuels and lubricants used onboard vessels. n. Influences on vessel stability and correct procedures relating to dry-docking, free surface, cargo shift and other occurrences affecting stability o. Procedures for the initiation and coordination of temporary and permanent repair and/or replacement procedures on board vessels at sea, alongside and in dry dock p. Safety, environmental and hazard control precautions and procedures relevant to shipboard machinery inspection and maintenance operations q. Maintenance and repair records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities r. Knowledge of fuel, bilge and ballast systems, machinery and equipment and ability to read and interpret material safety data sheets, technical specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams

Evidence Guide

MANAGE FUEL, BILGE AND BALLAST OPERATIONS PROCEDURES ON VESSELS OVER 750 KW PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<p>s. Maritime communication techniques needed during fuel and ballast operations</p> <p>t. Knowledge and ability to read and interpret machinery performance readings and indications</p> <p>u. Basic principles and procedures of machinery lubrication, including:</p> <ul style="list-style-type: none"> u.1. theory and types of lubrication u.2. relative characteristics, and applications of mineral and synthetic oils u.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to manage fuel, bilge and ballast operations on vessels of 750 kW propulsion power and more, including the ability to identify an appropriate range of possible machinery malfunctions and take appropriate action; and/or b. Carry out fuel, bilge and ballast operations in a range of operational situations on a commercial or training vessel of 750 kW propulsion power or more
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 carrying out fuel, bilge and ballast operations on a vessel a.2 identifying fuel, bilge and ballast machinery and equipment malfunctions on a vessel a.3 taking action to minimise any damage and pollution that could be caused by fuel, bilge and ballast machinery malfunctions a.4 identifying and evaluating fuel, bilge and ballast operational problems and determining an appropriate courses of action a.5 applying safety precautions relevant to fuel, bilge and ballast operations a.6 completing operational and maintenance documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of international Conventions and Codes and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 Anti-pollution procedures and regulations including the MARPOL Convention b.4 ISM Code safety management system procedures and work instructions fuel and ballast operations and related maintenance, including machinery specifications and directions on equipment capability and limitations b.5 waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	2	3	3

TDM MR15 01A OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OVER 750 KW PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate, monitor and evaluate engine performance within the limits of responsibility of a Marine Engineer (Class 2) on a commercial vessel powered by main propulsion machinery of 750 kW propulsion power or above.

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate and maintain engines and propulsion plant</p>	<p>a. Engines, propulsion plant and auxiliary machinery are managed and operated in accordance with the limits of responsibility of an Engineer (Class 2)</p> <p>b. The performance of engines and propulsion plant is monitored in accordance with bridge orders, company procedures, survey requirements and manufacturer's instructions and performance is compared with technical specifications and recommended limits of performance</p> <p>c. The methods of measuring the load capacity of the engines are in accordance with manufacturer's technical specifications</p> <p>d. Poor performance and faults are identified in accordance with established marine engineering practice</p> <p>e. Poor performance and faults are investigated in accordance with marine engineering practice and manufacturer's instructions and appropriate action initiated to rectify the identified problem</p> <p>f. Appropriate action is taken to prevent damage in accordance with vessel's planned maintenance system or procedures, established marine engineering practice, safety regulations and manufacturer's instructions</p> <p>g. Faulty engine equipment and components are identified and are reported and action is initiated as required for repair or replacement in accordance with the limits of responsibility of an Engineer (Class 2)</p> <p>h. Decisions made to carry out temporary or permanent repairs depending on the vessel's position and circumstances</p> <p>i. Appropriate consultation is undertaken with senior engineer, class society and marine administration concerning the nature of the repairs and any contingency or emergency action required</p> <p>j. Management of the repair processes and the organisation and control of engine room personnel to facilitate repairs is in accordance with the limits of responsibility of an Engineer (Class 2)</p>

<p>2. Repair faults in engines, propulsion plant or auxiliary machinery</p>	<ul style="list-style-type: none"> a. Identified faults in engines, propulsion plant or auxiliary machinery are investigated using established fault-finding techniques in accordance with the limits of responsibility of an Engineer (Class 2) b. Malfunctioning or faulty engines, propulsion plant or auxiliary machinery are correctly isolated and disassembled, if necessary, in accordance with manufacturer's instructions and established marine engineering practice c. Damaged or faulty components are repaired or replaced in accordance with planned maintenance system or procedures, manufacturer's instructions and established marine engineering practice d. Repaired engines, propulsion plant or auxiliary machinery are re-assembled in accordance with manufacturer's instructions and established marine engineering practice e. Repaired engines, propulsion plant or auxiliary machinery are re-started and adjusted in accordance with vessel's procedures and manufacturer's instructions and in consultation with relevant personnel f. Performance of repaired engines, propulsion plant or auxiliary machinery and associated safety devices, control systems and alarms is checked in accordance with manufacturer's instructions g. Performance against recommended technical specifications is confirmed and the engines, propulsion plant or auxiliary machinery is re-commissioned in accordance with vessel's procedures
<p>3. Complete operational and performance evaluation documentation</p>	<ul style="list-style-type: none"> a. Correct records are made relating to the operation and performance evaluation of engines, propulsion plant and auxiliary equipment and any engine or machinery failure incidents b. All operational and performance evaluation documentation is completed in accordance with vessel's procedures, bridge orders, survey and company requirements and regulations
<p>4. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Vessel's safety management procedures and safety regulations are applied in the operation and performance evaluation of engines, propulsion plant and auxiliary machinery b. Hazards involved in engine, propulsion plant and auxiliary equipment operation and performance evaluation are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations d. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed e. Action is taken in the event of an engine or machinery failure or emergency to secure the engine or machinery and the vessel and maintain the safety of the vessel and persons involved and shipboard emergency and contingency plans followed

Range Of Variables

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of marine engineering practice to the operation, monitoring and evaluation of engine performance on vessels of 750 kW propulsion power and more across a wide and often unpredictable variety of operational contexts. Contribution to the development and implementation of a broad plan or strategy for the operation, monitoring and evaluation of engine performance is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to operation, monitoring and evaluation of engine and propulsion plant performance within the limits of responsibility of an Engineer (Class 2). This includes management and control of personnel, analysis of the situation and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The operation, monitoring and evaluation of engine and plant installation performance may be undertaken on an Australian or international commercial vessels of 750 kW propulsion power or more b. The operation, monitoring and evaluation of engine performance may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. when bunkering b.7. during cargo operations c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. Types of engines, propulsion equipment and related auxiliary machinery may include: <ul style="list-style-type: none"> d.1. steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls d.2. steering gear, stabilizers, bow thrusters, rudders d.3. fluid power systems and controls d.4. pumps and pumping systems d.5. auxiliary systems and controls, including <ul style="list-style-type: none"> d.5.1. fresh and salt water cooling systems d.5.2. lubricating oil cooling systems d.5.3. fuel, oil, gas, coal d.5.4. air starting d.5.5. lubrication d.5.6. onboard air compressors and compressed air and control air systems d.5.7. waste management and pollution control systems as per the MARPOL Convention d.5.8. sewage plant d.5.9. fixed fire fighting installations and fire control systems d.5.10. auxiliary boilers and waste heat generators

Range Of Variables (continued)

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>e. Potential hazards during operations and performance evaluation of engines, propulsion plant and auxiliary machinery may include:</p> <ul style="list-style-type: none"> e.1. moving heavy loads using unsafe lifting procedures e.2. unsecured machinery, components or repair equipment e.3. slippery deck e.4. sharp tools and implements e.5. power tools e.6. moving and rotating machinery e.7. flammable liquids, vapours and fuel e.8. faulty machinery equipment handling equipment and lifting gear e.9. using equipment beyond safe working limits e.10. poor housekeeping procedures e.11. non-compliance with safe working procedures e.12. electrical wiring and systems e.13. hot pipes and valves (steam, fuel oil, lubricating oil) e.14. cold pipes and valves (refrigeration and liquefied gas cargoes) e.15. working at heights e.16. dangerous atmosphere <p>f. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> a.1. meters and gauges a.2. computer displays of performance parameters a.3. hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. a.4. greasing and lubrication tools a.5. electric power tools, such as grinders, lathes, drills, etc. a.6. pneumatic power tools, such as grinders, sanders, drills, etc. a.7. welding equipment a.8. block and tackle a.9. portable and manual lifting equipment and hydraulic jacks a.10. material safety data sheets a.11. protective clothing and equipment such as: <ul style="list-style-type: none"> a.11.1. eye and ear protection a.11.2. safety boots a.11.3. dust and fume masks a.11.4. safety helmet a.11.5. boiler suit/overalls <p>g. Emergencies may include:</p> <ul style="list-style-type: none"> g.1. loss of propulsion g.2. loss of electrical power g.3. loss of steerage g.4. flooding of engine room g.5. fire or explosion in engine room g.6. fuel oil, lubrication oil, steam and gas leaks g.7. overheating and overspeed of machinery, governors, emergency trips
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. engines, propulsion plant and auxiliary machinery manufacturer's specifications, instructions and recommended procedures a.4. operational and performance log, running sheets and records including computer database of operational and performance records where relevant a.5. vessel's survey as it relates to engines, propulsion plant and auxiliary machinery a.6. vessel's safety and emergency contingency plans and procedures a.7. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.8. instructions of relevant Maritime Authorities and class societies concerning the operation and performance evaluation of engines, propulsion plant and auxiliary machinery

Range Of Variables (continued)

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none">a. Applicable procedures and codes may include<ul style="list-style-type: none">a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation and performance evaluation of engines, propulsion plant and auxiliary machinery on vessels of 750 kW propulsion power or morea.2. relevant international, Australian and State/Territory OH&S legislationa.3. relevant international, Australian and State/Territory engineering practice standards

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage, operate, monitor and evaluate the performance of engines, propulsion plant and auxiliary machinery against technical within the scope of responsibility of an Engineer (Class 2) a.2. Identify malfunctioning and faulty engines, propulsion plant and auxiliary machinery and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.4. Identify typical operational and performance evaluation problems and hazards and take appropriate action within the scope of responsibility of an Engineer (Class 2) a.5. Communicate effectively with others during the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.6. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the operation and performance evaluation of marine engines, propulsion plant and auxiliary machinery b. Relevant OH&S legislation and policies c. Established engineering practice for the operation and performance evaluation of engines, propulsion plant and auxiliary machinery d. Operational characteristics and performance specifications for the different types of marine engines, propulsion plant and auxiliary machinery usually found on a vessel of 750 kW propulsion power or more e. Procedures for carrying out performance evaluation of engines, propulsion plant and auxiliary machinery as part of routine operational and maintenance procedures to ensure performance is in compliance with the bridge orders, technical specifications, survey requirements and established safety and anti-pollution rules and regulations f. The nature and causes of typical malfunctions and/or poor performance of engines, propulsion plant and auxiliary machinery and the available methods for their detection and rectification g. Hazards and problems that can occur during the operation and performance evaluation of marine engines, propulsion plant and auxiliary machinery and appropriate preventative and remedial action and solutions h. Safety, environmental and hazard control precautions and procedures relevant to the operation and performance evaluation of engines, propulsion plant and auxiliary machinery i. Operational and performance evaluation records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities j. Maritime communication techniques needed during the operation and performance evaluation of engines, propulsion plant and auxiliary machinery k. Knowledge and ability to read and interpret machinery performance readings and indications l. Knowledge and ability to read and interpret material safety data sheets, vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams m. Procedures for the testing of boiler water, machinery cooling water and lubricating oil n. Principles and operational characteristics of internal combustion engines, including: <ul style="list-style-type: none"> n.1. two stroke and four stroke cycles n.2. diesel engine scavenging systems both in normal and emergency operation n.3. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised n.4. shaft power n.5. irregularities in the performance of machinery and plant o. Methods of providing air for combustion

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OVER 750 KW PROPULSION POWER

3. Required knowledge and skills
(continued)

- p. Basic principles of fuel systems, including:
 - p.1. typical injection pressures and viscosities for different grades of fuel
 - p.2. alterations to fuel pumps, camshafts and injectors for varying fuel types
 - p.3. differences between constant and variable injection timing of fuel
 - p.4. injection requirements for different speeds of diesel engine
 - p.5. common service faults, symptoms and causes of combustion problems and related solutions
 - p.6. fuel line pulsation damping devices and leakage protection
 - p.7. fuel valve cooling arrangements
 - p.8. uni-fuel and dual fuel systems
- q. Basic principles of engine cooling and lubrication, including:
 - q.1. different methods of diesel engine cooling
 - q.2. need for treatment of engine cooling water
 - q.3. methods of treating engine cooling water
 - q.4. diesel engine lubrication requirements
 - q.5. methods of lubricating diesel engine components
 - q.6. theory and types of lubrication
 - q.7. relative characteristics, and applications of mineral and synthetic oils
 - q.8. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - q.9. common lubrication problems and their solution
- r. Basic principles of operation of hydraulic and electronic overspeed governors
- s. Basic principles of marine control systems, including:
 - s.1. common sensors and their associated transmitters
 - s.2. temperature and pressure control systems used onboard vessel
 - s.3. methods of load-dependent cooling of diesel alternators on heavy fuel oils
 - s.4. principles of level control systems used onboard vessel
 - s.5. principles of electronic PID controllers
- t. Basic principles and functions of machinery space monitoring and alarm systems including:
 - t.1. central cooling and load dependent cooling control systems
 - t.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control
 - t.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis
- u. Theory and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including:
 - u.1. plans for hazard reduction
 - u.2. procedures for extinguishing scavenge fires and dealing with crankcase mist detector alarms
 - u.3. regaining of control after starting airline, crankcase and gearbox explosions
- v. Basic principles of thermodynamics and heat and heat engines, including:
 - v.1. heat transfer
 - v.2. gases
 - v.3. properties and expansion of steam
 - v.4. steam cycles
 - v.5. boilers and evaporators
 - v.6. steam turbines
 - v.7. combustion
 - v.8. refrigeration and air conditioning.
- w. Basic principles and characteristics of steam turbines, gearing and associated equipment including:
 - w.1. lubrication
 - w.2. gear configurations
 - w.3. thrust blocks
 - w.4. air ejectors
 - w.5. determination of shaft power
 - w.6. irregularities in the performance of machinery and plant
- x. Principles and operational characteristics of main and auxiliary boilers and associated equipment including:
 - x.1. boiler water tests and treatment
 - x.2. corrosion
 - x.3. superheaters
 - x.4. de-aerators
 - x.5. open and closed feed systems
 - x.6. uptake fires

Evidence Guide (continued)

OPERATE, MONITOR AND EVALUATE ENGINE PERFORMANCE ON VESSELS OVER 750 KW PROPULSION POWER

3. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to operate and evaluate the performance of marine engines, propulsion plant and auxiliary systems typically found on a vessel of 750 kW propulsion power or more; and/or b. Operate and evaluate the performance of marine engines, propulsion plant and auxiliary systems in a range of operational situations on a commercial or training vessel of 750 kW propulsion power or more
4. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. Operating, monitoring and evaluating the performance of engines, propulsion plant and auxiliary machinery against technical specifications a.2. Identifying malfunctioning and faulty engines, propulsion plant and auxiliary machinery and initiate appropriate action for repair or replacement a.3. Exercising all required safety, environmental and hazard control precautions and procedures when overseeing the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.4. completing required documentation, reports and records when operating, monitoring and evaluating the performance of engines, propulsion plant and auxiliary machinery b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on the operation and performance evaluation of engines, propulsion plant and auxiliary machinery, including machinery specifications and directions on equipment capability and limitations b.4. plant and machinery security procedures b.5. following on-board housekeeping processes b.6. waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify engine, plant and machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code d. Work is managed, controlled and completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MR16 01A PLAN AND SCHEDULE OPERATIONS ON VESSELS OVER 750 KW
PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to plan and schedule operations of a vessel's power installation and auxiliary machinery within the limits of responsibility of a Marine Engineer (Class 2) on a commercial vessel powered by main propulsion machinery of 750 kW propulsion power or above.

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan operations of vessel's power installation and auxiliary machinery</p>	<p>a. Bridge orders and operational instructions for the proposed voyage are correctly interpreted in accordance with vessel and company procedures and established marine engineering practice</p> <p>b. Capacity and technical specifications of engines, propulsion plant and auxiliary machinery are reviewed and confirmed</p> <p>c. Operational plans for the vessel's power installation and auxiliary machinery are prepared that suit the design parameters of the installation and machinery and the requirements of the proposed voyage in accordance with the limits of responsibility of an Engineer (Class 2)</p> <p>d. Contingency and emergency plans are prepared based on a risk assessment of potential engine room operational problems and hazards that could occur during the voyage in accordance with the limits of responsibility of an Engineer (Class 2)</p>
<p>2. Schedule operations of vessel's power installation and auxiliary machinery</p>	<p>a. Operational schedules for the vessel's power installation and auxiliary machinery are prepared based on the confirmed operational plan using established project planning techniques in accordance with the limits of responsibility of an Engineer (Class 2)</p> <p>b. Operational schedules are documented in accordance with vessel and company procedures</p> <p>c. Operational schedules are distributed to relevant personnel onboard vessel in accordance with vessel and company procedures</p>

Range Of Variables

PLAN AND SCHEDULE OPERATIONS ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of marine engineering management practice to the planning and scheduling of the operation of the vessel's power installation and auxiliary machinery on vessels of 750 kW propulsion power and more across a wide and often unpredictable variety of operational situations during a voyage. Contribution to the development and implementation of a broad plan or strategy for the operation of the vessel's power installation and auxiliary machinery is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to planning and scheduling the operation of the vessel's power installation and auxiliary machinery within the limits of responsibility of an Engineer (Class 2). This includes management and analysis of the power installation capacity and voyage requirements, decision making and contingency planning.
2. Worksite environment	<ul style="list-style-type: none"> a. Planning and scheduling of the operation of power installation and auxiliary machinery may be undertaken for an Australian or international commercial vessel of 750 kW propulsion power or more b. Operational scheduling and planning methods may include the use of: <ul style="list-style-type: none"> b.1. GANTT charts b.2. CPM / PERT network techniques b.3. Other project planning techniques c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. Types of engines, propulsion equipment and related auxiliary machinery may include: <ul style="list-style-type: none"> d.1. Steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls d.2. steering gear, stabilizers, bow thrusters, rudders d.3. fluid power systems and controls d.4. pumps and pumping systems d.5. auxiliary systems and controls, including <ul style="list-style-type: none"> d.5.1. fresh and salt water cooling systems d.5.2. lubricating oil cooling systems d.5.3. fuel, oil, gas, coal d.5.4. air starting d.5.5. lubrication d.5.6. bilge and ballast system, oily water separator d.5.7. refrigeration and air-conditioning plant and equipment d.5.8. onboard air compressors and compressed air and control air systems d.5.9. waste management and pollution control systems as per the MARPOL Convention d.5.10. evaporators d.5.11. inert gas generator d.5.12. cargo pumps, tank washing machines and associated systems d.5.13. purifiers and clarifiers d.5.14. heaters d.5.15. sewage plant d.5.16. fixed fire fighting installations and fire control systems d.5.17. auxiliary boilers and waste heat generators d.5.18. life saving appliances d.5.19. maintenance to hull and vessel side valves

Range Of Variables (continued)

PLAN AND SCHEDULE OPERATIONS ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> e. Potential emergencies may include: <ul style="list-style-type: none"> e.1. loss of propulsion e.2. loss of electrical power e.3. loss of steerage e.4. flooding of engine room e.5. fire or explosion in engine room e.6. fuel oil, lubrication oil, steam and gas leaks e.7. overheating and overspeed of machinery, governors, emergency trips
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include: <ul style="list-style-type: none"> a.1. details of scheduled voyage a.2. ISM Code safety management system plans, procedures, checklists and instructions a.3. vessel and company's operational procedures and instructions a.4. engines, propulsion plant and auxiliary machinery manufacturer's specifications, instructions and recommended procedures a.5. maintenance log, running sheets and records including computer database of running information and maintenance records where relevant a.6. vessel's survey as it relates to engines, propulsion plant and auxiliary machinery a.7. vessel's safety and emergency contingency plans and procedures a.8. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with the operation and performance evaluation of engines, propulsion plant and auxiliary machinery a.9. instructions of relevant Maritime Authorities and class societies concerning the operation of engines, propulsion plant and auxiliary machinery
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include: <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the operation of engines, propulsion plant and auxiliary machinery on vessels of 750 kW propulsion power or more a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

Evidence Guide

PLAN AND SCHEDULE OPERATIONS ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and schedule the operations of vessel's power installation and auxiliary machinery for the voyage of a vessel within the scope of responsibility of an Engineer (Class 2) a.2. Comply with all required safety, environmental and hazard control precautions and procedures when planning the operations of vessel's power installation and auxiliary machinery a.3. Identify typical potential operational problems and hazards and develop appropriate contingency plans in accordance with the scope of responsibility of an Engineer (Class 2) a.4. Document and disseminate operational plans and schedules a.5. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the planning and scheduling of the operations of the power installations and auxiliary machinery b. Relevant OH&S legislation and policies c. Established engineering practice for the planning and scheduling of the and or more d. Engineering project scheduling and planning methods including the use of GANTT charts and CPM / PERT network techniques e. Operational characteristics and performance specifications for the different types of marine engines, propulsion plant and auxiliary machinery usually found on a vessel of 750 propulsion power or more f. Procedures for the planning and scheduling of the operation of the power installations and auxiliary machinery on vessels of 750 kW propulsion power and more g. The nature and causes of typical potential malfunctions and/or poor performance of engines, propulsion plant and auxiliary machinery h. Hazards and problems that can occur with power installations and auxiliary machinery during voyages of vessels of 750 kW propulsion power and more and appropriate preventative and remedial action and solutions i. Safety, environmental and hazard control precautions and procedures relevant to the operation of the power installations and auxiliary machinery on vessels of 750 kW propulsion power or more j. Operational and performance evaluation records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities k. Maritime communication techniques needed when planning and scheduling of the operation of the power installation and auxiliary machinery l. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams m. Knowledge and ability to read and interpret material safety data sheets n. Basic principles and operational characteristics of internal combustion engines, including: <ul style="list-style-type: none"> n.1. two stroke and four stroke cycles n.2. diesel engine scavenging systems both in normal and emergency operation n.3. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised n.4. shaft power n.5. irregularities in the performance of machinery and plant o. Methods of providing air for combustion p. Theory and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including: <ul style="list-style-type: none"> p.1. plans for hazard reduction p.2. procedures for extinguishment of scavenge fires and dealing with crankcase mist detector alarm p.3. regaining of control after starting airline, crankcase and gearbox explosions

Evidence Guide (continued)

PLAN AND SCHEDULE OPERATIONS ON VESSELS OVER 750 KW PROPULSION POWER

3. Required knowledge and skills
(continued)
- q. Basic principles of fuel systems, including:
 - q.1. typical injection pressures and viscosities for different grades of fuel
 - q.2. alterations to fuel pumps, camshafts and injectors for varying fuel types
 - q.3. differences between constant and variable injection timing of fuel
 - q.4. injection requirements for different speeds of diesel engine
 - q.5. common service faults, symptoms and causes of combustion problems and related solutions
 - q.6. fuel line pulsation damping devices and leakage protection
 - q.7. fuel valve cooling arrangements
 - q.8. uni-fuel and dual fuel systems
 - r. Basic principles of engine cooling and lubrication, including:
 - r.1. different methods of diesel engine cooling
 - r.2. need for treatment of engine cooling water
 - r.3. methods of treating engine cooling water
 - r.4. diesel engine lubrication requirements
 - r.5. methods of lubricating diesel engine components
 - r.6. theory and types of lubrication
 - r.7. relative characteristics, and applications of mineral and synthetic oils
 - r.8. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - r.9. common lubrication problems and their solution
 - s. Basic principles of marine control systems, including:
 - s.1. common sensors and their associated transmitters
 - s.2. temperature and pressure control systems used onboard vessel
 - s.3. methods of load-dependent cooling of diesel alternators on heavy fuel oils
 - s.4. principles of level control systems used onboard vessel
 - s.5. principles of electronic PID controllers
 - t. Procedures for the testing of boiler water, machinery cooling water and lubricating oil
 - u. Principles of operation of hydraulic and electronic overspeed governors
 - v. Basic principles and functions of machinery space monitoring and alarm systems including:
 - v.1. central cooling and load dependent cooling control systems
 - v.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control
 - v.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis
 - w. Basic principles of air-conditioning and refrigeration systems, including:
 - w.1. principles of operation
 - w.2. performance indicators
 - w.3. characteristics, hazards and handling requirements of CFCs and HCFCs
 - w.4. safety and environmental requirements associated with air-conditioning and refrigeration systems
 - x. Basic principles of thermodynamics and heat and heat engines, including:
 - x.1. heat transfer
 - x.2. gases
 - x.3. properties and expansion of steam
 - x.4. steam cycles
 - x.5. boilers and evaporators
 - x.6. steam turbines
 - x.7. combustion
 - x.8. refrigeration and air conditioning.
 - y. Principles and operational characteristics of steam turbines, gearing and associated equipment including:
 - y.1. lubrication
 - y.2. gear configurations
 - y.3. thrust blocks
 - y.4. air ejectors
 - y.5. determination of shaft power
 - y.6. irregularities in the performance of machinery and plant

Evidence Guide (continued)

PLAN AND SCHEDULE OPERATIONS ON VESSELS OVER 750 KW PROPULSION POWER

<p>3. Required knowledge and skills (continued)</p>	<p>z. Basic principles and operational characteristics of main and auxiliary boilers and associated equipment including:</p> <ul style="list-style-type: none"> z.1. boiler water tests and treatment z.2. corrosion z.3. superheaters z.4. de-aerators z.5. open and closed feed systems z.6. uptake fires
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to plan and schedule the operations of the power installation and auxiliary machinery for the voyage of a vessel of 750 kW propulsion power or more; and/or b. Plan and schedule the operations of a vessel's power installation and auxiliary machinery for the voyage of a commercial or training vessel of 750 kW propulsion power or more
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. planning and scheduling the operation of the power installation and auxiliary machinery for the voyage of a vessel a.2. complying with all required safety, environmental and hazard control precautions and procedures when planning the operation of a vessel's power installation and auxiliary machinery a.3. identifying typical potential operational problems and hazards and developing appropriate contingency plans a.4. documenting and disseminating operational plans and schedules b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on the operation of a vessel's power installation and auxiliary machinery, including machinery specifications and directions on equipment capability and limitations b.4. waste, pollution and recycling management processes c. Work is managed, controlled and completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MR17 01A START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OVER 750 KW PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to start up and shut down main propulsion and auxiliary machinery and associated systems within the limits of responsibility of a Marine Engineer (Class 2) on a vessel powered by main propulsion machinery of 750 kW propulsion power or above.

This covers the knowledge and skills required to work as:

- Chief Engineer on vessels between 750 and 3,000 kW propulsion power
- First Engineer (Second Engineer for STCW 95 Code) on vessels over 750 kW propulsion power.

The unit is consistent with the related functional standard in Section A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Prepare the start up of main propulsion and auxiliary machinery</p>	<p>a. Method of preparing the start up of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions and established engineering practice</p> <p>b. Procedures for making available fuels, lubricants, cooling water, steam and air for the start up of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions and established engineering practice</p> <p>c. Required precautions are taken prior to start up of main propulsion and auxiliary machinery to minimise and control hazards and operational risks</p> <p>d. Potential problems with the start up of main propulsion and auxiliary machinery are identified and investigated and appropriate action is initiated to rectify any problems that occur</p>
<p>2. Start up and warm up main propulsion and auxiliary machinery</p>	<p>a. Main propulsion and auxiliary machinery is started up and warmed up in response to bridge orders in accordance with the limits of responsibility of an Engineer (Class 2)</p> <p>b. Checks of pressures, temperatures, and revolutions during the start up and warm up period of the operation of main propulsion and auxiliary machinery are made in accordance with manufacturers' technical specifications and agreed work plans</p> <p>c. Out of specification measures of pressures, temperatures, and revolutions during the start up and warm up period are investigated and appropriate action initiated to rectify any malfunctions or faults</p>
<p>3. Prepare the shut down of main propulsion and auxiliary machinery</p>	<p>a. Method of preparing the shut down of main propulsion and auxiliary machinery is in accordance with manufacturers' specifications and instructions and established engineering practice</p> <p>b. Required precautions are taken prior to shut down of main propulsion and auxiliary machinery to minimise and control hazards and operational risks</p> <p>c. Potential problems with the shut down of main propulsion and auxiliary machinery are identified and investigated and appropriate action is initiated to report and rectify the problems</p>
<p>4. Supervise the cooling down of the engine</p>	<p>a. The cooling down of the engine is supervised in accordance with manufacturers' specifications and instructions and established engineering practice</p>

5. **Follow safety and hazard control procedures**

- a. Start up and shut down hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment
- b. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during start up and shut down operations
- c. Where relevant, safety management procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed
- d. Action is taken in the event of a machinery failure or emergency during start up or shut down of main propulsion and auxiliary machinery to secure the machinery and the vessel and ensure the safety of the vessel and persons involved
- e. Shipboard emergency and contingency plans are correctly followed in the event of a machinery failure or emergency during start up or shut down of main propulsion and auxiliary machinery
- f. Vessel's internal communication system is used during warm through and shut down operations in accordance with established procedures

Range Of Variables

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability for self and others in achieving the prescribed outcomes within the limits of responsibility of an Engineer (Class 2). c. Work involves the application of marine engineering practice to the start up and shut down of the main propulsion and auxiliary machinery and associated systems typically found on vessels of 750 kW propulsion power and more across a wide and often unpredictable variety of operational contexts. Contribution to the development and implementation of procedures for start up and shut down operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, engineering and leadership functions related to the start up and shut down the main propulsion and auxiliary machinery and associated systems within the limits of responsibility of an Engineer (Class 2). This includes management, training and control of personnel, analysis of operational requirements and decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. The main propulsion and auxiliary machinery and associated systems to be started up and shut down may include those found on Australian or international commercial vessels of 750 kW propulsion power and more b. The main propulsion and auxiliary machinery and associated systems may be started up and shut down <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. during berthing and unberthing operations b.4. while anchored or moored b.5. in dry dock b.6. when bunkering b.7. during cargo operations c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. Auxiliary machinery and associated systems may include: <ul style="list-style-type: none"> d.1.1. fresh and salt water cooling systems d.1.2. lubricating oil cooling systems d.1.3. fuel, oil, gas, coal systems and centrifuges d.1.4. air compressor and air starting systems d.1.5. lubrication d.1.6. bilge and ballast system, oily water separator d.1.7. refrigeration and air-conditioning plant and equipment d.1.8. onboard air compressors and compressed air and control air systems d.1.9. waste management and pollution control systems as per the MARPOL Convention d.1.10. evaporators d.1.11. inert gas generator d.1.12. cargo pumps, tank washing machines and associated systems d.1.13. purifiers and clarifiers d.1.14. heaters d.1.15. sewage plant d.1.16. fixed fire fighting installations and fire control systems d.1.17. auxiliary boilers and waste heat generators

Range Of Variables (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OVER 750 KW PROPULSION POWER

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>e. Emergencies may include:</p> <ul style="list-style-type: none"> e.1. loss of propulsion e.2. loss of electrical power e.3. loss of steerage e.4. flooding e.5. fire or explosion e.6. loss of refrigeration e.7. loss of water making ability e.8. fuel oil, lubrication oil, steam and gas leaks e.9. overheating and overspeed of machinery, governors, emergency trips
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel and company's planned maintenance system, repair procedures and instructions a.3. machinery and vessel manufacturer's specifications, instructions and recommended procedures a.4. maintenance log, running sheets and records including computer database of running information and maintenance records where relevant a.5. vessel's survey as it relates to shipboard machinery a.6. vessel's safety and emergency contingency plans and procedures a.7. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules dealing with shipboard machinery maintenance and repair a.8. instructions of relevant Maritime Authorities and class societies concerning shipboard machinery maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to shipboard machinery maintenance and repair on vessels of 750 kW propulsion power and more a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant international, Australian and State/Territory engineering practice standards

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OVER 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a. Monitor and control the start up and shut down of the main propulsion and auxiliary machinery and associated systems within the scope of responsibility of an Engineer (Class 2) b. Identify problems and hazards with the start up and shut down of the main propulsion and auxiliary machinery and associated and initiate appropriate action for repair or replacement within the scope of responsibility of an Engineer (Class 2) c. Exercise all required safety, environmental and hazard control precautions and procedures when starting up and shutting down the main propulsion and auxiliary machinery and associated systems d. Communicate effectively with others during start up and shut down operations e. Ensure adherence to national and international regulations, IMO Conventions and Codes
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of the job role of an Engineer (Class 2).
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant national and international regulations, IMO Conventions and Codes including AMSA Marine Orders applicable to the start up and shut down of main and auxiliary machinery and associated systems b. Relevant OH&S legislation and policies c. Established engineering practice for the start up and shut down of main and auxiliary machinery and associated systems d. Operational characteristics and performance specifications for the different types of main and auxiliary machinery and associated systems usually found on vessel of 750 kW power and more e. Procedures for carrying out the start up and shut down of main and auxiliary machinery and associated systems to ensure compliance with the company and survey requirements and established safety rules and regulations f. The nature and causes of typical start up and shut down malfunctions of main and auxiliary machinery and associated systems and the available methods for their detection and rectification g. Safety, environmental and hazard control precautions and procedures relevant to the start up and shut down of main and auxiliary machinery and associated systems h. Principle features of vessel construction and principles of longitudinal stability i. A basic understanding of the properties and application of materials and structures typically used in the construction of vessels of 750 kW power and more and their associated operational machinery j. Types of operational records that must be maintained on a vessel to meet the requirements of the company, survey requirements and regulatory authorities k. Maritime communication techniques needed during the start up and shut down of main and auxiliary machinery and associated systems l. Knowledge and ability to read and interpret material safety data sheets m. Procedures for the testing of boiler water, machinery cooling water and lubricating oil n. Knowledge and ability to read and interpret machinery performance readings and indications o. Knowledge and ability to read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams p. Principles and operational characteristics of internal combustion engines, including: <ul style="list-style-type: none"> p.1. two stroke and four stroke cycles p.2. optimum combustion parameters and their control p.3. diesel engine scavenging systems both in normal and emergency operation p.4. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised

Evidence Guide (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OVER 750 KW PROPULSION POWER

3. Required knowledge and skills
(continued)
- q. Basic principles of fuel systems, including:
 - q.1. typical injection pressures and viscosities for different grades of fuel
 - q.2. alterations to fuel pumps, camshafts and injectors for varying fuel types
 - q.3. differences between constant and variable injection timing of fuel
 - q.4. injection requirements for different speeds of diesel engine
 - q.5. common service faults, symptoms and causes of combustion problems and related solutions
 - q.6. fuel line pulsation damping devices and leakage protection
 - q.7. fuel valve cooling arrangements
 - q.8. uni-fuel and dual fuel systems
 - r. Basic principles of engine cooling and lubrication, including:
 - r.1. different methods of diesel engine cooling
 - r.2. need for treatment of engine cooling water
 - r.3. methods of treating engine cooling water
 - r.4. diesel engine lubrication requirements
 - r.5. methods of lubricating diesel engine components
 - r.6. theory and types of lubrication
 - r.7. relative characteristics, and applications of mineral and synthetic oils
 - r.8. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants
 - r.9. common lubrication problems and their solution
 - s. Principles of operation of hydraulic and electronic overspeed governors
 - t. Basic principles of marine control systems, including:
 - t.1. common sensors and their associated transmitters
 - t.2. temperature and pressure control systems used onboard vessel
 - t.3. methods of load-dependent cooling of diesel alternators on heavy fuel oils
 - t.4. principles of level control systems used onboard vessel
 - t.5. principles of electronic PID controllers
 - u. Principles and functions of machinery space monitoring and alarm systems including:
 - u.1. central cooling and load dependent cooling control systems
 - u.2. main engine control arrangements for fixed pitch and controllable pitch propeller systems requiring sequential control
 - u.3. alarm and monitoring systems involving data loggers, alarm loggers and trend analysis
 - v. Theory and preventative strategies for scavenge and uptake fires, and starting airline, crankcase and gearbox explosions, including:
 - v.1. plans for hazard reduction
 - v.2. procedures for extinguishment of scavenge fires and dealing with crankcase mist detector alarm
 - v.3. regaining of control after starting airline, crankcase and gearbox explosions
 - w. Methods of providing air for combustion
 - x. Principles of operation of key auxiliary systems, including:
 - x.1. Feed systems
 - x.2. air-conditioning and refrigeration systems
 - y. Principles and procedures of machinery lubrication, including:
 - y.1. theory and types of lubrication
 - y.2. relative characteristics, and applications of mineral and synthetic oils
 - y.3. contaminants that may affect lubricants, their effect on machinery performance, and action that can be taken to avoid and remedy contamination of lubricants

Evidence Guide (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OVER 750 KW PROPULSION POWER

<p>3 Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> z. Basic principles of mechanics as they relate to forces, pressures, stress and strains in shipboard dynamic machinery, including: <ul style="list-style-type: none"> z.1. statics (mainly concurrent systems) z.2. friction z.3. dynamics z.4. balancing z.5. radial, circumferential and, longitudinal stress z.6. shear stress z.7. fluid mechanics z.8. torsion, hollow and solid shafts z.9. loads due to liquid head aa. Basic principles of transverse stability and principles of naval architecture and vessel construction relevant to detection, identification and repair of faults, including: <ul style="list-style-type: none"> aa.1. draught, trim and heel aa.2. propellers aa.3. structural strength and vibration of vessels aa.4. vessel measurement and classification aa.5. load line aa.6. basic principles of transverse stability aa.7. principles of free surface effects aa.8. drydocks aa.9. lifesaving equipment aa.10. hull repairs and maintenance bb. Basic principles of thermodynamics and heat and heat engines, including: <ul style="list-style-type: none"> bb.1. heat transfer bb.2. gases bb.3. properties and expansion of steam bb.4. steam cycles bb.5. boilers and evaporators bb.6. steam turbines bb.7. combustion bb.8. refrigeration and air conditioning. cc. Basic principles and operational characteristics of steam turbines, gearing and associated equipment including: <ul style="list-style-type: none"> cc.1. lubrication cc.2. gear configurations cc.3. thrust blocks cc.4. air ejectors cc.5. shaft power cc.6. irregularities in the performance of machinery and plant dd. Basic principles and operational characteristics of main and auxiliary boilers and associated equipment including: <ul style="list-style-type: none"> dd.1. boiler operation in normal and emergency procedures dd.2. feed systems for marine boilers dd.3. various fittings mounted on boilers and their functions dd.4. boiler water tests and treatment dd.5. corrosion dd.6. superheaters dd.7. de-aerators dd.8. open and closed feed systems dd.9. uptake fires
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to start up and shut down the main propulsion and auxiliary machinery and associated systems typically found on a vessel of 750 kW propulsion power or more; and/or b. Start up and shut down the propulsion and auxiliary machinery and associated systems in a range of operational situations on a commercial or training vessel of 750 kW propulsion power or more

Evidence Guide (continued)

START UP AND SHUT DOWN MAIN PROPULSION AND AUXILIARY MACHINERY AND ASSOCIATED SYSTEMS ON VESSELS OVER 750 KW PROPULSION POWER

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. starting up and shutting down the main propulsion and auxiliary machinery and associated systems typically found on a vessel of typically 750 kW propulsion power or more a.2. identifying problems and hazards with the start up and shut down of the main propulsion and auxiliary machinery and associated systems and initiate appropriate action for rectification a.3. exercising all required safety, environmental and hazard control precautions and procedures when starting up and shutting down the main propulsion and auxiliary machinery and associated systems a.4. communicating effectively with others during start up and shut down operations a.5. identifying and implementing improvements to start up and shut down procedures a.6. applying safety precautions relevant to start up and shut down operations a.7. completing operational documentation and records <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of international Conventions and Codes and AMSA Marine Orders b.2. OHS regulations and hazard prevention policies and procedures b.3. issue resolution procedures b.4. ISM Code safety management system procedures and work instructions on the start up and shut down of the main propulsion and auxiliary machinery and associated systems typically found on a vessel of 750 kW propulsion power or more, including machinery specifications and directions on equipment capability and limitations b.5. machinery security procedures b.6. following on-board housekeeping processes b.7. waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify machinery malfunctions, non-conformities, accidents, hazardous occurrences and safety incidents in accordance with statutory requirements, company procedures and the ISM Code</p> <p>d. Work is managed, controlled and completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MR18 01A OPERATE DECK MACHINERY INSTALLED ON A SMALL VESSEL

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out basic user-maintenance on shipboard lifting equipment and deck machinery in accordance with manufacturer's recommendations, regulations and vessel operational procedures.

The unit is consistent with the relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Operate deck machinery	a. Deck machinery is operated in accordance with procedures and manufacturer's instructions and specifications
2. Carry out basic user-maintenance on deck machinery	a. The performance of deck machinery is routinely monitored in accordance manufacturer's instructions b. Machinery faults are identified and appropriate action initiated to report or rectify the problem within the limits of responsibility in accordance with vessel's procedures c. Basic routine service checks and procedures are followed to maintain the serviceability of deck machinery in accordance with manufacturer's instructions
3. Follow safety and hazard control procedures	a. All required safety precautions and regulations are followed when operating deck machinery b. Safety and hazard minimisation procedures and regulations are followed at all times during the operation of deck machinery c. Appropriate action is taken in the event of a failure or emergency involving deck machinery to isolate and secure the relevant equipment and the ship and maintain the safety of the ship and persons involved d. Shipboard emergency and contingency plans followed in the event of a failure or emergency involving deck machinery

Range Of Variables

OPERATE DECK MACHINERY INSTALLED ON A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel between 75kW and 150 kW propulsion power b. Operation and basic maintenance of deck machinery may be conducted: <ul style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. during berthing and unberthing operations a.5. while anchored or moored a.6. in dry dock c. Deck machinery may include: <ul style="list-style-type: none"> c.1. lifting equipment c.2. winches c.3. capstans c.4. basic hydraulic systems d. Basic user-maintenance may include: <ul style="list-style-type: none"> d.1. routine servicing in accordance with established procedures d.2. routine visual and performance checks d.3. identification of poor performance or faults in the operation of deck machinery d.4. identification of faulty equipment, lifting gear or machinery components and arranging for repair or replacement d.5. application of lubricants to moving parts of deck machinery e. Maintenance tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools including screwdrivers, spanners, wrenches e.2. greasing and lubrication tools e.3. protective clothing and equipment such as: <ul style="list-style-type: none"> e.3.1. eye and ear protection e.3.2. headgear e.3.3. safety boots
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant regulations a.2. deck machinery operation and maintenance procedures a.3. manufacturer's instructions, specifications and recommended procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Relevant sections of the Australian USL Code related to the operation and maintenance of deck machinery on small vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

OPERATE DECK MACHINERY INSTALLED ON A SMALL VESSEL

1. Critical aspects of evidence to be considered	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <p>a.1. Operate deck machinery on a small commercial vessel</p> <p>a.2. Identify typical problems related to the operation of deck machinery on a small vessel and take appropriate action</p> <p>a.3. Exercise all required safety, environmental and hazard control precautions and procedures during operation of deck machinery on a small vessel</p> <p>a.4. Communicate effectively with others when operating deck machinery on a small vessel</p>
2. Interdependent assessment of units	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
3. Required knowledge and skills	<p>a. Relevant OH&S and pollution control legislation and policies</p> <p>b. Procedures for the operation of deck machinery on a small vessel</p> <p>c. Safety, environmental and hazard control precautions and procedures relevant to the operation of deck machinery on a small vessel</p> <p>d. Principle features and operating characteristics of deck machinery used on small vessels, including:</p> <p>d.1. lifting equipment and gear</p> <p>d.2. winches and capstans</p> <p>e. Problems related to the operation of deck machinery and appropriate action and solutions</p> <p>f. Maritime communication techniques needed during the operation of deck machinery on small commercial vessels</p>
4. Resource implications	<p>Access is required to opportunities to either:</p> <p>a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate deck machinery on a small vessel, and/or</p> <p>b. operate deck machinery on an operational small commercial or training vessel</p>
5. Consistency in performance	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 operating deck machinery on a small commercial vessel</p> <p>a.2 applying safety and pollution control precautions when operating deck</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 sections of relevant regulations</p> <p>b.2 OHS regulations and hazard prevention policies</p> <p>b.3 job procedures and work instructions</p> <p>b.4 relevant vessel manufacturer's guidelines relating to operating deck machinery</p> <p>b.5 environmental protection procedures when carrying out maintenance operations</p> <p>c. Action is taken promptly to report and/or rectify issues and problems identified with operating deck machinery in accordance with procedures and manufacturer's instructions</p> <p>d. Work is completed systematically with required attention to detail</p>
6. Context for assessment	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	1

TDM MR19 01A SAFELY HANDLE AND STOW EXPLOSIVE AND FLAMMABLE MATERIALS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to safely handle and stow explosive and flammable materials, including stowage and management of flammable and explosive liquids, gases, solids and other materials likely to be carried on a small vessel. In particular this may include spare fuel, lubricants, LPG cooking gas and flares liquid fuels and refrigerant gases.

The unit is consistent with the sections in the Australian USL Code dealing with the competency requirements of Marine Engine Drivers (Grades 1, 2 and 3).

ELEMENT	PERFORMANCE CRITERIA
1. Handle and stow explosive and flammable materials	<ul style="list-style-type: none"> a. Preparations for handling and stowing explosive and flammable materials are made in accordance with relevant hazardous materials regulations and materials safety data sheets b. Explosive or flammable materials are correctly identified prior to commencement of handling and stowage operations c. Techniques for handling of the hazardous materials are selected and correctly applied according to the type of materials to be handled and/or stowed d. Communication with others is clear, concise and acknowledged at all times according to good hazardous materials handling practice and regulations e. Records of explosive or flammable materials handled or stowed on the vessel are completed in accordance with regulatory requirements and vessel's procedures
2. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Potential hazards when handling explosive and dangerous materials are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment b. Required safety precautions and hazard minimisation procedures and regulations are followed at all times when handling and stowing explosive and flammable materials c. Action is taken in the event of a safety incident or emergency involving explosive or flammable materials to secure the materials and the vessel and maintain the safety of the vessel and persons involved

Range Of Variables

SAFELY HANDLE AND STOW EXPLOSIVE AND FLAMMABLE MATERIALS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Explosive and flammable materials may include those handled or stowed on a small commercial vessel by a Marine Engine Driver (Grade1, 2 and 3) b. Types of explosive and flammable materials may include: <ul style="list-style-type: none"> b.1. spare diesel or petroleum fuel b.2. lubricants b.3. LPG b.4. refrigerant gases b.5. flares c. Handling of explosive and flammable materials may need to be carried out <ul style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. while anchored or moored a.5. during maintenance operations a.6. when vessel is slipped a.7. when transferring fuel a.8. during cargo operations d. Hazards when handling and stowing explosive or flammable materials may include: <ul style="list-style-type: none"> d.1. faulty materials handling equipment d.2. damaged or corroded fuel or LPG containers d.3. leaking or spill flammable liquid or explosive gas d.4. materials handling operations in poor weather or sea conditions d.5. incorrectly stowed explosive and flammable materials d.6. incorrectly lashed or secured dangerous cargo d.7. naked flames, ignition or sparks d.8. explosion or fire d.9. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. company materials handling procedures a.2. relevant materials safety data sheets a.3. records and inventories of explosive or flammable materials stored on a small vessel a.4. instruction from manufacturer's of explosive or flammable materials a.5. instructions of relevant Maritime Authorities related to the handling of explosive and flammable materials onboard small vessels a.6. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code related to the handling and stowage of explosive and flammable materials onboard a small vessel a.2. relevant international, Australian and State/Territory OH&S legislation concerning the handling and stowage of explosive and flammable materials

Evidence Guide

SAFELY HANDLE AND STOW EXPLOSIVE AND FLAMMABLE MATERIALS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Handle and stow various types of explosive and flammable materials typically found on a small vessel a.2. Exercise all required safety, environmental and hazard control precautions and procedures during the handling and stowage of explosive and flammable materials a.3. Communicate effectively with others when handling and stowing explosive and flammable materials onboard a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grades 1, 2 and 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and hazardous materials legislation, and codes of practice b. Explosive and flammable materials identification codes and signage requirements c. Materials safety data sheets and their use d. Methods for handling various types of explosive and flammable materials typically stowed on a small vessel e. Characteristics, hazards and problems of different types of explosive and flammable materials typically stowed on a small vessel, and associated preventative and remedial action and solutions f. Implications for the handling and stowage of explosive and flammable materials of various wind, weather and sea conditions g. Communication techniques required in the course of handling or stowage of explosive and flammable materials onboard a small vessel h. Records required concerning the handling or stowage of explosive and flammable materials onboard a small vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to handle and stow explosive and flammable materials onboard a small vessel, and/or a.2. handle and stow explosive and flammable materials during seetime on a small commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 handling and stowing explosive and flammable materials onboard a small vessel a.2 taking required safety precautions when handling or stowing explosive and flammable materials onboard a small vessel b. Shows evidence of application of relevant workplace procedures including <ul style="list-style-type: none"> b.1 relevant sections of the Australian USL Code b.2 relevant OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions c. Action is taken promptly to report and/or rectify problems and safety incidents during handling and stowing of explosive and flammable materials onboard a small vessel d. Work is completed systematically with required attention to detail and standard procedures

Evidence Guide (continued)

SAFELY HANDLE AND STOW EXPLOSIVE AND FLAMMABLE MATERIALS

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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

TDM MR21 01A OPERATE AND MAINTAIN ENGINES AND MACHINERY AND AUXILIARY POWER SOURCES ON VESSELS OF LESS THAN 3,000 KW PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out basic routine maintenance on engines, machinery and auxiliary power systems on a commercial vessel less than 3,000 kW propulsion power operating up to offshore limits.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of an Engineer (Class 3).

ELEMENT	PERFORMANCE CRITERIA
1. Operate engines and auxiliary power systems	<ul style="list-style-type: none"> a. Engines, machinery and auxiliary power systems are prepared, started, and shut down in accordance with manufacturers' instructions and established marine practice b. Engines, machinery and auxiliary power systems are operated within specified limits in accordance with established procedures and manufacturer's instructions and specifications and within limits of responsibility of an Engineer (Class 3) c. Records of performance of engines, machinery and auxiliary power systems are maintained on running sheets and operations logs / databases in accordance with vessel's procedures
2. Carry out basic, routine checking and maintenance procedures on engines, machinery and auxiliary power systems	<ul style="list-style-type: none"> a. The performance of engines, machinery and auxiliary power systems is monitored in accordance with vessel's survey requirements and manufacturer's instructions and within limits of responsibility of an Engineer (Class 3) b. Preventative and remedial maintenance programs are carried out in accordance with company and vessel's procedures, vessel's survey requirements and manufacturer's instructions and within limits of responsibility of an Engineer (Class 3) c. Poor performance and faulty operation are identified and appropriate action initiated to report or rectify the problem within the limits of responsibility in accordance with and procedures d. Routine service checks and procedures are followed to maintain the serviceability of engines, machinery and auxiliary power systems in accordance with manufacturer's instructions e. Maintenance and service records are completed in accordance with manufacturer's instructions and vessel's procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times b. Operational and maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Action is taken in the event of failure or emergency to isolate and secure the engines, machinery and auxiliary power systems and maintain the safety of the vessel and persons involved e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving internal combustion engines or the propulsion system

Range Of Variables

OPERATE AND MAINTAIN ENGINES AND MACHINERY AND AUXILIARY POWER SOURCES ON VESSELS OF LESS THAN 3000 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the organisation of maintenance operations on a vessel and the application of solutions to a defined range of maintenance problems falling within limits of responsibility of an Engineer (Class 3).
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 3,000 kW propulsion power operating within inshore limits b. Operation and maintenance of engines, machinery and auxiliary power systems may be conducted: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock c. Engines, machinery and auxiliary power systems may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. reduction gears c.6. thrust blocks, detuners and shaft bearings c.7. starting and reversing arrangements d. Maintenance may include: <ul style="list-style-type: none"> d.1. preventative and remedial maintenance and basic repairs of engines, machinery and auxiliary power systems and related equipment and components d.2. lubrication of engines, machinery and auxiliary power systems d.3. routine servicing in accordance with established procedures d.4. routine visual and performance checks d.5. identification of poor performance or faults in the operation of engines, machinery and auxiliary power systems d.6. identification of faulty equipment or fittings and arranging for repair or replacement d.7. assisting contractors in repair operations e. Maintenance tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools including screwdrivers, spanners, wrenches e.2. greasing and lubrication tools e.3. lifting gear and equipment e.4. protective clothing and equipment such as: <ul style="list-style-type: none"> e.4.1. eye and ear protection e.4.2. safety boots and helmet e.4.3. dust and fume masks f. Maintenance and repair hazards may include: <ul style="list-style-type: none"> f.1. moving heavy loads using unsafe lifting procedures f.2. unsecured machinery, components or repair equipment f.3. slippery deck f.4. power tools f.5. moving and rotating machinery f.6. flammable liquids, vapours and fuel f.7. faulty machinery equipment handling equipment and lifting gear f.8. using equipment beyond safe working limits f.9. poor housekeeping procedures f.10. non-compliance with safe working procedures

Range Of Variables (continued)

OPERATE AND MAINTAIN ENGINES AND MACHINERY AND AUXILIARY POWER SOURCES ON VESSELS OF LESS THAN 3000 KW PROPULSION POWER

3. Sources of information / documents	a. Documentation / records may include a.1. ISM Code Safety Management System operational and maintenance procedures a.2. vessel's planned maintenance system, repair procedures and instructions a.3. manufacturer's specifications, instructions and recommended procedures a.4. maintenance records a.5. vessel's safety and emergency contingency plans and procedures a.6. relevant material safety data sheets a.7. relevant sections of the Australian USL Code
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. relevant sections of the Australian USL Code related to the operation and maintenance of engines, machinery and auxiliary power systems on vessels up to 3,000 kW propulsion power a.2. ISM Code a.3. MARPOL Convention a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation a.5. relevant Australian engineering standards

Evidence Guide

OPERATE AND MAINTAIN ENGINES AND MACHINERY AND AUXILIARY POWER SOURCES ON VESSELS OF LESS THAN 3000 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate engines, machinery and auxiliary power systems on a vessel of up to 3,000 kW propulsion power within limits of responsibility of an Engineer (Class 3) a.2. Carry out preventative and remedial maintenance on engines, machinery and auxiliary power systems on vessels up to 3,000 kW propulsion power within limits of responsibility of an Engineer (Class 3) a.3. Identify typical problems related to the operation and maintenance of engines, machinery and auxiliary power systems on a vessel and take appropriate fault-finding and corrective action falling within limits of responsibility of an Engineer (Class 3) a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine maintenance of maintenance of engines, machinery and auxiliary power systems a.5. Communicate effectively with others when operating and carrying out maintenance on engines, machinery and auxiliary power systems on a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a Engineer (Class 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S and pollution control legislation and codes of practice c. Types of engines and propulsion systems used on vessels up to 3,000 kW propulsion power, including their principle features and operating characteristics d. Procedures for the operation and routine maintenance of engines, machinery and auxiliary power systems on vessels up to 3,000 kW propulsion power including: <ul style="list-style-type: none"> d.1. fitting d.2. machining d.3. gas cutting and welding d.4. arc welding d.5. workshop practice e. Mathematical techniques to solve basic engineering and maintenance problems f. Basic properties of liquids and gases commonly used aboard vessels g. Precautions that must be taken to minimise danger of fire or explosion h. Elementary principles, care and management of auxiliary power sources (steam and motor), including boilers and their fittings i. Describe the alignment of machinery and machinery parts j. Explain elementary principles and care and management of the various types of auxiliary pumps and pumping and piping systems and other shipboard auxiliaries k. Use gauges and meters to monitor and measure l. The basic principles of engine cooling, fuel and lubricating systems, including fuel consumption m. The basic principles of air compressors, their care and maintenance n. The basic principles of operation and safety of boilers, steam and feed systems, steam engines and turbines. o. The colour coding system used for electric conductors p. Basic principles of preventative and remedial maintenance q. Basic principles of the operation and maintenance of two and four stroke compression ignition engines, including causes of scavenge fires and crankcase explosions r. The causes, effects of, and methods of detection of boiler water contamination s. The basic principles and procedures for the care and management of boiler, fuel, air and feed t. Hazard control precautions and procedures relevant to the operation and routine maintenance of engines, machinery and auxiliary power systems u. Typical problems related to the operation and maintenance of engines, machinery and auxiliary power systems on vessels and appropriate diagnostic action and related solutions v. Maritime communication techniques needed during the operation and maintenance of engines, machinery and auxiliary power systems on vessels w. Maintenance records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities

Evidence Guide (continued)

OPERATE AND MAINTAIN ENGINES AND MACHINERY AND AUXILIARY POWER SOURCES ON VESSELS OF LESS THAN 3000 KW PROPULSION POWER

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and maintain engines, machinery and auxiliary power systems on vessels up to 3,000 kW propulsion power and/or b. operate and maintain engines, machinery and auxiliary power systems on an operational commercial or training vessel up to 3,000 kW propulsion power operating within inshore limits
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating engines, machinery and auxiliary power systems on vessels up to 3,000 kW propulsion power operating within inshore limits a.2 carrying out preventative and remedial maintenance on engines, machinery and auxiliary power systems on vessels up to 3,000 kW propulsion power operating within inshore limits a.3 identifying and evaluating typical operational and maintenance problems and determining appropriate courses of action a.4 applying safety and pollution control precautions when operating engines, machinery and auxiliary power systems on a vessel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to operating and carrying out routine maintenance on engines, machinery and auxiliary power systems on a vessel b.5 environmental protection procedures when carrying out maintenance operations c. Action is taken promptly to report and/or rectify issues and problems identified with operating and maintaining engines, machinery and auxiliary power systems in accordance with manufacturer's instructions d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	1	2	2

TDM MR22 01A OPERATE AND MAINTAIN BOILER SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out basic routine maintenance on boiler systems on a commercial vessel less than 3,000 kW propulsion power operating up to offshore limits.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of an Engineer (Class 3)

ELEMENT	PERFORMANCE CRITERIA
1. Operate boiler systems	<ul style="list-style-type: none"> a. Boiler systems are operated in accordance with established procedures and manufacturer's instructions and specifications b. Records of performance of boiler systems are maintained on running sheets and operations logs / databases in accordance with vessel's procedures
2. Carry out basic, routine checking and maintenance procedures on boiler systems	<ul style="list-style-type: none"> a. The performance of boiler systems is monitored in accordance with manufacturer's instructions b. Routine service checks and procedures are carried out to maintain the serviceability of boiler systems in accordance with manufacturer's instructions and vessel's procedures c. Preventative and remedial maintenance programs are carried out in accordance with manufacturer's instructions d. Poor performance and faulty operation are identified and investigated and appropriate action initiated to report or rectify the problem within the limits of responsibility e. Basic repairs are carried out on boiler systems and equipment as required f. Assistance is provided to contractors engaged to carry out repairs on boiler systems g. Maintenance and service records are completed in accordance with manufacturer's instructions and vessel's procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times when operating systems and carrying out basic maintenance b. Operational and maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Action is taken in the event of failure or emergency to isolate and secure the boiler systems and maintain the safety of the vessel and persons involved e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving an boiler system

Range Of Variables

OPERATE AND MAINTAIN BOILER SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the operation and maintenance of boiler systems on a vessel and the application of solutions to a defined range of maintenance problems falling within limits of responsibility of an Engineer (Class 3).
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 3,000 kW propulsion power operating within inshore limits b. Operation and maintenance of boiler systems may be conducted: <ul style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. during berthing and unberthing operations a.5. while anchored or moored a.6. in dry dock a.7. when bunkering a.8. during cargo operations c. Boiler systems d. Maintenance may include: <ul style="list-style-type: none"> d.1. preventative and remedial maintenance and basic repairs of boiler systems and related equipment and components d.2. routine servicing in accordance with established procedures d.3. routine visual checks d.4. identification of poor performance or faults in the operation of boiler systems d.5. identification of faulty equipment or fittings and arranging for repair or replacement d.6. assisting contractors in repair operations e. Maintenance tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools including screwdrivers, spanners, wrenches e.2. lifting gear and equipment e.3. protective clothing and equipment such as: <ul style="list-style-type: none"> e.3.1. eye and ear protection e.3.2. safety boots and helmet e.3.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. Australian USL Code a.3. company and vessel operational and maintenance procedures a.4. preventative and remedial maintenance schedules and records a.5. equipment manufacturer's instructions, specifications and recommended procedures a.6. instructions of relevant Maritime Authorities related to the maintenance of vessels a.7. relevant Australian standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code related to the operation and maintenance of boiler systems on vessels a.2. relevant IMO Conventions and Codes a.3. relevant international, Australian and State/Territory OH&S and pollution control legislation a.4. relevant international and Australian engineering standards

Evidence Guide

OPERATE AND MAINTAIN BOILER SYSTEMS

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Operate boiler systems on a vessel within limits of responsibility of an Engineer (Class 3) a.2. Carry out preventative and remedial maintenance on boiler systems on a vessel within limits of responsibility of an Engineer (Class 3) a.3. Identify typical problems related to the operation and maintenance of boiler systems on a vessel and take appropriate action within limits of responsibility of an Engineer (Class 3) a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine maintenance of systems a.5. Communicate effectively with others when operating and carrying out maintenance on boiler systems on a vessel
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a Engineer (Class 3).
3. Required knowledge and skills	a. Knowledge of relevant maritime regulations b. Relevant OH&S and pollution control legislation and codes of practice c. Statutory requirements for the operation and maintenance of medium to low pressure steam plants and boiler systems d. Types of medium to low pressure boiler systems used on vessels up to 3,000 kW propulsion power, including their principle features and operating characteristics e. Basic construction of medium to low pressure boilers, including fittings that accord with safety and statutory requirements f. The basic principles of operation and safety of boilers, steam and feed systems, steam engines and turbines, including the care and management of boilers and their fittings and basic feed water systems, testing and treatment g. Procedures for the operation and routine maintenance of medium to low pressure boiler systems on vessels up to 3,000 kW propulsion power falling within limits of responsibility of an Engineer (Class 3) h. Basic properties of steam i. Procedures for the use gauges and meters to monitor and measure performance j. The causes, effects of, and methods of detection of boiler water contamination k. Hazard control precautions and procedures relevant to the operation and routine maintenance of steam plants and boiler systems l. Typical problems related to the operation and maintenance of boiler systems on vessels and appropriate diagnostic action and related solutions m. Mathematical techniques to solve basic engineering and maintenance problems n. Precautions that must be taken to minimise danger of fire or explosion. o. Maintenance records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities

Evidence Guide (continued)

OPERATE AND MAINTAIN BOILER SYSTEMS

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and maintain boiler systems on vessels up to 3,000 kW propulsion power, and/or b. operate and maintain boiler systems on an operational commercial or training vessel up to 3,000 kW propulsion power operating within inshore limits
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating boiler systems on vessels up to 3,000 kW propulsion power operating within inshore limits a.2 carrying out preventative and remedial maintenance on boiler systems on a vessel a.3 identifying and evaluating typical operational and maintenance problems and determining appropriate courses of action a.4 applying safety and pollution control precautions when operating boiler systems on a vessel a.5 identifying and implementing improvements to operational and routine maintenance procedures b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to operating and carrying out routine maintenance on boiler systems on a vessel b.5 environmental protection procedures when carrying out maintenance operations c. Action is taken promptly to report and/or rectify issues and problems identified with operating and maintaining boiler systems in accordance with manufacturer's instructions, statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2	2

TDM MR23 01A OPERATE AND MAINTAIN BATTERIES, STARTER MOTORS AND POWER DISTRIBUTION SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and maintain power generation equipment, electrical batteries, starter motors and power distribution systems on a commercial vessel less than 3,000 kW propulsion power operating up to offshore limits.

Note: All installation, maintenance and repair of AC (50 volts or above) or DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of an Engineer (Class 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate and monitor electrical machinery and electronic equipment</p>	<p>a. The vessel's batteries, starter motors and the power distribution systems is operated and monitored in accordance with manufacturer's instructions</p> <p>b. Shore power arrangements are correctly operated and maintained and performance monitored in accordance with company and shore authority procedures</p> <p>c. Poor performance and faults are identified and investigated in accordance with established practice and manufacturer's instructions and appropriate action is initiated to rectify the identified problem</p>
<p>2. Repair faults in electrical machinery and electronic equipment</p>	<p>a. Identified faults in vessel's batteries, starter motors and the power distribution systems are investigated using established fault-finding techniques</p> <p>b. Malfunctioning or faulty batteries, starter motors and the power distribution systems is correctly isolated and reported or disassembled, if necessary, in accordance with established procedures, licensing restrictions and manufacturer's instructions</p> <p>c. Damaged or faulty components are repaired or replaced in accordance with permissible voltages, licensing restrictions, established system procedures, and manufacturer's instructions</p> <p>d. Repaired batteries, starter motors and the power distribution systems and associated safety devices, control systems and alarms are re-started/re-activated and their performance tested in accordance with manufacturer's instructions</p> <p>e. Performance against specifications is confirmed and the batteries, starter motors and the power distribution systems is re-commissioned</p> <p>d. Coordination of the repair processes and assistance to electrical contractors to facilitate repairs is in accordance with established procedures</p>
<p>3. Complete maintenance and repair documentation</p>	<p>a. Required records are kept operation, testing, maintenance and repair activities and equipment failure incidents</p> <p>b. All planned maintenance and repair documentation is completed as required</p>

4. Follow safety and hazard control procedures

- a. Operation and routine maintenance of electrical systems are monitored to ensure compliance with safety regulations
- b. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times
- c. Operational and maintenance hazards related to electrical systems use and basic maintenance are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment
- d. Action is taken in the event of failure or emergency to ensure the isolation and security of electrical systems and equipment and maintain the safety of the vessel and personnel involved
- e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving deck machinery

Range Of Variables

OPERATE AND MAINTAIN BATTERIES, STARTER MOTORS AND POWER DISTRIBUTION SYSTEMS

VARIABLE	SCOPE
1. General context	<p>a. Work must be carried out in compliance with the relevant maritime regulations.</p> <p>b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving required outcomes. It involves the operation, testing and maintenance of batteries, starter motors and the power distribution systems on a vessel up to 3,000 kW propulsion power and the application of solutions to a defined range of operational and maintenance problems falling within limits of responsibility of an Engineer (Class 3).</p> <p>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel</p>
2. Worksite environment	<p>a. Power generation equipment, batteries, starter motors and the power distribution systems may include those typically found on a commercial vessel of up to 3,000 kW propulsion power operating within inshore limits</p> <p>b. Performance monitoring and repair of shipboard batteries, starter motors and the power distribution systems may be carried out</p> <p>b.1. by day or night in both normal and emergency situations</p> <p>b.2. under any permissible conditions of weather</p> <p>b.3. while underway</p> <p>b.4. during berthing and unberthing operations</p> <p>b.5. while anchored or moored</p> <p>b.6. in dry dock</p> <p>b.7. when bunkering</p> <p>b.8. during cargo operations</p> <p>c. Power distribution systems may include::</p> <p>c.1.1. distribution circuits and wiring</p> <p>c.1.2. protection devices</p> <p>c.1.3. circuit breakers</p> <p>c.1.4. a.c. motors generators and alternators</p> <p>c.1.5. d.c. motors and generators</p> <p>c.1.6. electronic instrumentation and power supply circuits</p> <p>c.1.7. emergency supply systems including emergency generators, emergency switchboard and battery banks</p> <p>d. Emergencies may include:</p> <p>d.1. loss of electrical power</p> <p>d.2. short circuits and open-circuits in distribution systems</p> <p>d.3. loss of electronic / electrical control of systems</p> <p>d.4. damaged batteries</p> <p>d.5. flooding of vessel</p> <p>d.6. fire or explosion onboard vessel</p> <p>d.7. failure of emergency alarm and control systems</p> <p>d.8. loss of refrigeration</p> <p>d.9. overloading of electrical systems</p> <p>e. Testing and repair equipment may include:</p> <p>e.1. electronic instrumentation meters and gauges</p> <p>e.2. computer displays of performance parameters</p> <p>e.3. hand tools, such as soldering irons, pliers, cutters, wire-strippers, spanners, wrenches, screwdrivers, hacksaws, etc.</p> <p>e.4. electric and pneumatic power tools, such as drills, etc.</p> <p>e.5. portable and manual lifting equipment including block and tackle and hydraulic jacks</p> <p>e.6. material safety data sheets</p> <p>e.7. protective clothing and equipment such as:</p> <p>e.7.1. eye and ear protection</p> <p>e.7.2. safety boots and helmet</p> <p>e.7.3. dust and fume masks</p> <p>e.7.4. boilersuit/overalls</p>

Range Of Variables (continued)

OPERATE AND MAINTAIN BATTERIES, STARTER MOTORS AND POWER DISTRIBUTION SYSTEMS

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>f. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> f.1. exposed live circuits and faulty earth connections f.2. moving heavy loads using unsafe lifting procedures f.3. unsecured machinery and equipment f.4. sharp tools and implements f.5. power tools f.6. moving and rotating electrical machinery and electronic control equipment f.7. faulty equipment, handling equipment and lifting gear f.8. using equipment beyond safe working limits f.9. poor housekeeping procedures f.10. non-compliance with safe working procedures f.11. electrical wiring and systems f.12. working at heights f.13. overspeed of electrical machinery, emergency trips
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. maintenance and repair procedures and instructions a.3. specifications, instructions and recommended procedures of the manufacturer's of the vessel's batteries, starter motors and the power distribution systems a.4. maintenance logs and records a.5. vessel's survey procedures and instructions as they relate to vessel's batteries, starter motors and the power distribution systems a.6. vessel's safety and emergency contingency plans and procedures a.7. relevant sections of the Australian USL Code dealing with maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of AMSA Marine Orders and USL Code related to shipboard batteries, starter motors and the power distribution systems maintenance and repair on vessels up to 3,000 kW propulsion power a.2. ISM Code a.3. relevant Australian and State/Territory OH&S and pollution control legislation a.4. requirements of relevant State/Territory electrical licensing authorities

Evidence Guide

OPERATE AND MAINTAIN BATTERIES, STARTER MOTORS AND POWER DISTRIBUTION SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate and monitor the performance of batteries, starter motors and the power distribution systems against specifications on a vessel up to 3,000 kW propulsion power a.2. Identify malfunctioning and faulty batteries, starter motors and the power distribution systems and components and initiate appropriate action for repair or replacement a.3. Make safe faulty electrical systems and equipment a.4. Trouble-shoot malfunctioning and faulty batteries, starter motors and the power distribution systems and carry out required repairs within limits of responsibility of an Engineer (Class 3) and relevant electrical licensing authority restrictions a.5. Exercise all required safety and hazard control precautions and procedures when overseeing the operation, maintenance and repair of vessel's batteries, starter motors and the power distribution systems a.6. Identify typical operational and maintenance and repair problems and hazards and take appropriate action within limits of responsibility of an Engineer (Class 3) a.7. Communicate effectively with others during maintenance and repair operations including effective use of internal communication systems a.8. Ensure adherence to relevant maritime regulations and requirements of relevant State/Territory electrical licensing authorities
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an Engineer (Class 3).</p>
<p>3. Required knowledge and skills</p>	<p>a. Knowledge of relevant maritime regulations applicable to the operation and maintenance of batteries, starter motors and the power distribution systems on vessels up to 3,000 kW propulsion power</p> <p>b. Regulations of relevant State/Territory electrical licensing authorities</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><i>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel.</i></p> </div> <ul style="list-style-type: none"> c. Relevant OH&S and pollution control legislation, policies and procedures d. Procedures for carrying out shipboard batteries, starter motors and the power distribution systems testing, trouble-shooting and repair as part of routine maintenance procedures falling within limits of responsibility of an Engineer (Class 3) e. A basic understanding of the power distribution and control circuits used on board vessels of up to 3,000 kW propulsion power and their associated operational electrical machinery and electronic control equipment f. Typical operational characteristics and performance specifications for the different types of batteries, starter motors and the power distribution systems found on a vessel up to 3,000 kW propulsion power g. The nature and causes of malfunctions in batteries, starter motors and the power distribution systems and the available methods for their detection and repair h. Mathematical techniques to solve basic engineering and maintenance problems procedures falling within limits of responsibility of an Engineer (Class 3) i. Procedures for the use of instruments and meters to monitor and measure j. The colour coding system used for electric conductors k. Definitions of electrical terms and solve basic electrical problems using mathematics. l. Principles of battery operation and maintenance including parallel operation of batteries m. The basic principles of operation and operating procedures for A.C. and D.C. generators. n. Basic principles of preventative and remedial maintenance. o. Precautions and procedures for electrical safety during repair and inspection of electrical circuitry and equipment. p. Principles and procedures for electrical measurement, including the use of relevant instruments q. Knowledge and ability to read and interpret performance readings and instrumentation

Evidence Guide (continued)

OPERATE AND MAINTAIN BATTERIES, STARTER MOTORS AND POWER DISTRIBUTION SYSTEMS

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> r. Maritime communication techniques needed during maintenance and repair operations s. Knowledge and ability to read and interpret material safety data sheets t. Knowledge and ability to read and interpret specifications, drawings, and manuals u. Principles of electrotechnology, including: <ul style="list-style-type: none"> u.1. the electric circuit u.2. basics of cabling, distribution and lighting systems typically used on a small vessel u.3. deck electrical machinery and related electronic control equipment u.4. instruments, calibration and testing u.5. fire and emergency alarm systems. v. Safety, environmental and hazard control precautions and procedures relevant to maintenance operations on marine batteries, starter motors and the power distribution systems w. Safe procedures for the use of hand and power tools and maintenance equipment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated fault situations and other assessments that demonstrate the skills and knowledge to operate, test and maintain batteries, starter motors and the power distribution systems; and/or b. Operate, test and maintain batteries, starter motors and the power distribution systems over a range of operational situations on a commercial or training vessel.
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating and testing batteries, starter motors and the power distribution systems a.2 identifying shipboard malfunctions in batteries, starter motors and the power distribution systems on a vessel up to 3,000 kW propulsion power a.3 applying safety precautions relevant to batteries, starter motors and the power distribution systems maintenance and repair operations a.4 completing maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS and electrical licensing regulations b.3 manufacturers specifications and instructions for the operation, testing and maintenance of batteries, starter motors and power distribution systems b.4 following on-board housekeeping processes c. Action taken promptly to report and/or rectify malfunctions in batteries, starter motors and the power distribution system d. Work is managed, controlled and completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MR24 01A OPERATE AND MAINTAIN INTERNAL COMBUSTION ENGINES AND PROPULSION TRANSMISSION SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out basic routine maintenance on internal combustion engines and propulsion systems on a small commercial vessel of up to 1,500 kW propulsion power.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 1).

ELEMENT	PERFORMANCE CRITERIA
1. Operate internal combustion engines and propulsion systems	<ul style="list-style-type: none"> a. Internal combustion engines and propulsion systems are prepared, started, and shut down in accordance with manufacturers' instructions and established marine practice b. Internal combustion engines and propulsion systems are operated within specified limits in accordance with established procedures and manufacturer's instructions and specifications c. Records of performance of internal combustion engines and propulsion systems are maintained on running sheets and operations logs / databases in accordance with vessel's procedures
2. Carry out basic, routine checking and maintenance procedures on internal combustion engines and propulsion systems	<ul style="list-style-type: none"> a. The performance of internal combustion engines and propulsion systems is monitored in accordance with vessel's survey requirements and manufacturer's instructions and performance is compared with specifications and recommended limits of performance b. Preventative and remedial maintenance programs are carried out in accordance with company and vessel's procedures, vessel's survey requirements and manufacturer's instructions c. Poor performance and faulty operation are identified and appropriate action initiated to report or rectify the problem within the limits of responsibility and skill in accordance with company procedures d. Routine service checks and procedures are followed to maintain the serviceability of internal combustion engines and propulsion systems in accordance with manufacturer's instructions e. Maintenance and service records are completed in accordance with manufacturer's instructions and vessel's procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times b. Operational and maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Action is taken in the event of failure or emergency to isolate and secure the internal combustion engines and propulsion systems and maintain the safety of the vessel and persons involved e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving internal combustion engines or the propulsion system

Range Of Variables

OPERATE AND MAINTAIN INTERNAL COMBUSTION ENGINES AND PROPULSION TRANSMISSION SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the organisation of maintenance operations on a vessel and the application of solutions to a defined range of maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel up to 1,500 kW propulsion power b. Operation and maintenance of internal combustion engines and propulsion systems may be conducted: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Internal combustion engines and propulsion systems may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. reduction gears c.7. thrust blocks, detuners and shaft bearings d. Maintenance may include: <ul style="list-style-type: none"> d.1. preventative and remedial maintenance and basic repairs of internal combustion engines and propulsion systems and related equipment and components d.2. lubrication of internal combustion engines and propulsion systems d.3. routine servicing in accordance with established procedures d.4. routine visual and performance checks d.5. identification of poor performance or faults in the operation of internal combustion engines and propulsion systems d.6. identification of faulty equipment or fittings and arranging for repair or replacement d.7. assisting contractors in repair operations e. Maintenance tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools including screwdrivers, spanners, wrenches e.2. greasing and lubrication tools e.3. lifting gear and equipment e.4. protective clothing and equipment such as: <ul style="list-style-type: none"> e.4.1. eye and ear protection e.4.2. safety boots and helmet e.4.3. dust and fume masks f. Maintenance and repair hazards may include: <ul style="list-style-type: none"> f.1. moving heavy loads using unsafe lifting procedures f.2. unsecured machinery, components or repair equipment f.3. slippery deck f.4. power tools f.5. moving and rotating machinery f.6. flammable liquids, vapours and fuel f.7. faulty machinery equipment handling equipment and lifting gear f.8. using equipment beyond safe working limits f.9. poor housekeeping procedures f.10. non-compliance with safe working procedures

Range Of Variables (continued)

OPERATE AND MAINTAIN INTERNAL COMBUSTION ENGINES AND PROPULSION TRANSMISSION SYSTEMS

3. Sources of information / documents	a. Documentation / records may include a.1. vessel's planned maintenance system, repair procedures and instructions a.2. manufacturer's specifications, instructions and recommended procedures a.3. maintenance records a.4. vessel's safety and emergency contingency plans and procedures a.5. relevant material safety data sheets a.6. relevant sections of the Australian USL Code
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. Relevant sections of the Australian USL Code related to the operation and maintenance of internal combustion engines and propulsion systems on small vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation a.3. relevant Australian engineering standards

Evidence Guide

OPERATE AND MAINTAIN INTERNAL COMBUSTION ENGINES AND PROPULSION TRANSMISSION SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate internal combustion engines and propulsion systems on a small vessel a.2. Carry out preventative servicing and remedial maintenance on small internal combustion engines and propulsion systems on a small vessel within limits of responsibility of a Marine Engine Driver (Grade 1) a.3. Identify typical problems related to the operation, servicing and maintenance of internal combustion engines and propulsion systems on a small vessel and take appropriate action within limits of responsibility of a Marine Engine Driver (Grade 1) a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine maintenance of maintenance of internal combustion engines and propulsion systems a.5. Communicate effectively with others when operating and carrying out maintenance on internal combustion engines and propulsion systems on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation and codes of practice b. Types of engines and propulsion systems used on small vessels up to 1,500 kW propulsion power, including their principle features and operating characteristics c. Procedures for the operation, servicing and routine maintenance of internal combustion engines and propulsion systems on a small vessel d. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine maintenance of internal combustion engines and propulsion systems e. Problems related to the operation and maintenance of internal combustion engines and propulsion systems on small vessels and appropriate action and solutions within limits of responsibility of a Marine Engine Driver (Grade 1) f. Maritime communication techniques needed during the operation and maintenance of internal combustion engines and propulsion systems on small vessels g. Types of maintenance records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and maintain internal combustion engines and propulsion systems on small vessels up to 1,500 kW propulsion power and/or b. operate and maintain internal combustion engines and propulsion systems on an operational small commercial or training vessel up to 1,500 kW propulsion power

Evidence Guide (continued)

OPERATE AND MAINTAIN INTERNAL COMBUSTION ENGINES AND PROPULSION TRANSMISSION SYSTEMS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 operating internal combustion engines and propulsion systems on a small vessel vessels up to 1,500 kW propulsion power</p> <p>a.2 carrying out preventative servicing and remedial maintenance on internal combustion engines and propulsion systems on a small vessel within limits of responsibility of a Marine Engine Driver (Grade 1)</p> <p>a.3 identifying and evaluating typical operational, servicing and maintenance problems and determining appropriate courses of action within limits of responsibility of a Marine Engine Driver (Grade 1)</p> <p>a.4 applying safety and pollution control precautions when operating internal combustion engines and propulsion systems on a small vessel</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant sections of Australian USL Code</p> <p>b.2 OHS regulations and hazard prevention policies and procedures</p> <p>b.3 job procedures and work instructions</p> <p>b.4 relevant vessel manufacturer's guidelines relating to operating and carrying out routine maintenance on internal combustion engines and propulsion systems on a small vessel</p> <p>b.5 environmental protection procedures when carrying out maintenance operations</p> <p>c. Action is taken promptly to report and/or rectify problems identified with operating and maintaining internal combustion engines and propulsion systems in accordance with manufacturer's instructions</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	2	1	1	2	2

**TDM MR25 01A OPERATE AND MAINTAIN AUXILIARY MACHINERY SYSTEMS,
INCLUDING STEERING GEAR AND REFRIGERATION SYSTEMS**

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out basic routine maintenance on auxiliary systems on a small commercial vessel within the limits of responsibility of a Marine Engine Driver (Grade 1), including pumping systems, hydraulic systems, steering gear and refrigeration systems on a small vessel of up to 1,500 kW propulsion power.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 1).

ELEMENT	PERFORMANCE CRITERIA
1. Operate auxiliary systems	<ul style="list-style-type: none"> a. Auxiliary systems are prepared, started, and shut down in accordance with manufacturers' instructions b. Auxiliary systems are operated in accordance with established procedures and manufacturer's instructions and specifications c. Records of performance of auxiliary systems are maintained on running sheets and operations logs / databases in accordance with vessel's procedures
2. Carry out basic, routine checking and maintenance procedures on auxiliary systems	<ul style="list-style-type: none"> a. The performance of auxiliary systems is monitored in accordance with manufacturer's instructions b. Routine service checks and procedures are carried out to maintain the serviceability of auxiliary systems in accordance with manufacturer's instructions and vessel's procedures c. Preventative and remedial maintenance programs are carried out in accordance with manufacturer's instructions within the limits of responsibility of a Marine Engine Driver (Grade 1) d. Poor performance and faulty operation are identified and investigated and appropriate action initiated to report or rectify the problem within the limits of responsibility e. Basic repairs are carried out on auxiliary systems and equipment as required within the limits of responsibility of a Marine Engine Driver (Grade 1) f. Assistance is provided to contractors engaged to carry out repairs on auxiliary systems g. Maintenance and service records are completed in accordance with manufacturer's instructions and vessel's procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times when operating systems and carrying out basic maintenance b. Operational and maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Action is taken in the event of failure or emergency to isolate and secure the auxiliary systems and maintain the safety of the vessel and persons involved e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving an auxiliary system

Range Of Variables

MAINTAIN AND OPERATE AUXILIARY MACHINERY SYSTEMS, INCLUDING STEERING GEAR AND REFRIGERATION SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the organisation of maintenance operations on a vessel and the application of solutions to a defined range of maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel up to 1,500 kW propulsion power. b. Operation and maintenance of auxiliary systems may be conducted: <ul style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. during berthing and unberthing operations a.5. while anchored or moored a.6. in dry dock a.7. when bunkering a.8. during cargo operations c. Auxiliary systems may include: <ul style="list-style-type: none"> c.1. hydraulic systems including electro-hydraulic steering gears c.2. pumping systems, including: <ul style="list-style-type: none"> c.2.1. bilge c.2.2. fuel oil c.2.3. freshwater c.2.4. seawater c.3. refrigeration systems c.4. ballast systems c.5. compressed air systems c.6. control systems d. Maintenance may include: <ul style="list-style-type: none"> d.1. preventative and remedial maintenance and basic repairs of auxiliary systems and related equipment and components d.2. lubrication of equipment in auxiliary systems d.3. routine servicing in accordance with established procedures d.4. routine visual and performance checks d.5. identification of poor performance or faults in the operation of auxiliary systems d.6. identification of faulty equipment or fittings and arranging for repair or replacement d.7. assisting contractors in repair operations e. Maintenance tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools including screwdrivers, spanners, wrenches e.2. greasing and lubrication tools e.3. lifting gear and equipment e.4. protective clothing and equipment such as: <ul style="list-style-type: none"> e.4.1. eye and ear protection e.4.2. safety boots and helmet e.4.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Australian USL Code a.2. company and vessel operational and maintenance procedures a.3. preventative and remedial maintenance schedules and records a.4. equipment manufacturer's instructions, specifications and recommended procedures a.5. instructions of relevant Maritime Authorities related to the maintenance of small vessels a.6. relevant Australian standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Relevant sections of the Australian USL Code related to the operation and maintenance of auxiliary systems on small vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation a.3. relevant international and Australian engineering standards

Evidence Guide

MAINTAIN AND OPERATE AUXILIARY MACHINERY SYSTEMS, INCLUDING STEERING GEAR AND REFRIGERATION SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate auxiliary systems on a small vessel a.2. Carry out preventative servicing and remedial maintenance on auxiliary systems on a small vessel within the limits of responsibility of a Marine Engine Driver (Grade 1) a.3. Identify typical problems related to the operation and maintenance of auxiliary systems on a small vessel and take appropriate action in conjunction with crew a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine maintenance of systems a.5. Communicate effectively with others when operating and carrying out maintenance on auxiliary systems on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation and codes of practice b. Typical procedures for the operation and routine maintenance of auxiliary systems on a small vessel to ensure compliance with the company requirements and established safety and pollution control rules and regulations c. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations the operation and routine maintenance of auxiliary systems d. Principle features and operating characteristics of typical marine hydraulic systems used on small vessels, including: <ul style="list-style-type: none"> d.1. electro-hydraulic steering gears d.2. emergency operation in the event of electrical or hydraulic failure d.3. simple hydraulic circuits d.4. preventative and remedial Maintenance requirements of hydraulic systems e. Principle features and operating characteristics of typical steering systems and steering system components used on small vessels, including: <ul style="list-style-type: none"> e.1. rudder types rudder construction features e.2. rudder and stock support bearings e.3. glands, packing and seals e.4. tiller arm attachment e.5. steering operation using hydraulic, cable and rod and gear e.6. requirements for the maintenance and testing of steering and related hydraulic systems f. Principle features and operating characteristics of typical pumping systems and pumping system components used on small vessels, including: <ul style="list-style-type: none"> f.1. fire, bilge, and tank circulating systems f.2. basic fault identification and maintenance procedures f.3. basic procedures for the prevention of corrosion in pumping systems f.4. valve types including their construction and maintenance f.5. back flooding prevention procedures f.6. strainers, mudboxes and footvalves f.7. use of flexible materials, hoses, etc. f.8. drive systems, belts, clutches, motors, etc. g. Principle features and operating characteristics of typical refrigeration systems used on small vessels, including: <ul style="list-style-type: none"> g.1. basic principals of operation of refrigeration systems, including the refrigeration cycle g.2. types of refrigerant g.3. hazards of refrigerant gases g.4. components of typical refrigeration systems g.5. environmental issues and responsibilities concerning refrigeration systems h. Maritime communication techniques needed during the operation and basic maintenance of auxiliary systems on small vessels i. Problems related to the during the operation and basic maintenance of auxiliary systems on small vessels and appropriate action and solutions j. Types of maintenance records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities

Evidence Guide (continued)

MAINTAIN AND OPERATE AUXILIARY MACHINERY SYSTEMS, INCLUDING STEERING GEAR AND REFRIGERATION SYSTEMS

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and maintain auxiliary systems on small vessels up to 1,500 kW propulsion power and/or b. operate and maintain auxiliary systems on an operational small commercial or training vessel up to 1,500 kW propulsion power
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating auxiliary systems on a small vessel vessels up to 1,500 kW propulsion power a.2 carrying out preventative servicing and remedial maintenance on auxiliary systems on a small vessel within the limits of responsibility of a Marine Engine Driver (Grade 1) a.3 identifying and evaluating typical operational and maintenance problems and determining appropriate courses of action a.4 applying safety and pollution control precautions when operating auxiliary systems on a small vessel a.5 identifying and implementing improvements to operational and routine maintenance procedures b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to operating and carrying out routine maintenance on auxiliary systems on a small vessel b.5 environmental protection procedures when carrying out maintenance operations c. Action is taken promptly to report and/or rectify issues and problems identified with operating and maintaining auxiliary systems in accordance with manufacturer's instructions, statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2	2

TDM MR26 01A OPERATE, TEST, AND MAINTAIN MARINE ELECTRICAL AND CONTROL EQUIPMENT

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the basic skills and knowledge required to operate, test, and maintain electrical machinery and electronic control equipment on a commercial vessel up to 1,500 kW propulsion power, including low voltage D.C. equipment and A.C. generation machinery, protective devices and shore power arrangements.

Note: All installation, maintenance and repair of AC (50 volts or above) or DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 1).

ELEMENT	PERFORMANCE CRITERIA
1. Operate and monitor electrical machinery and electronic equipment	<ul style="list-style-type: none"> a. The vessel's electrical machinery and electronic control equipment is operated and monitored in accordance with manufacturer's instructions b. Shore power arrangements are correctly operated and maintained and performance monitored in accordance with company and shore authority procedures c. Poor performance and faults are identified and investigated in accordance with established practice and manufacturer's instructions and appropriate action is initiated to rectify the identified problem or report it for action by a contractor in accordance with established procedures
2. Repair faults in electrical machinery and electronic equipment	<ul style="list-style-type: none"> a. Identified faults in vessel's electrical machinery and electronic control equipment are investigated using established fault-finding techniques on permissible voltages b. Malfunctioning or faulty electrical machinery and electronic control equipment is correctly isolated and reported for contract repair, if necessary, in accordance with established procedures, permissible voltages, licensing restrictions and manufacturer's instructions c. Damaged or faulty components are repaired, replaced or reported to contractors in accordance with established system procedures, licensing restrictions and manufacturer's instructions d. Repaired electrical machinery and electronic control equipment are re-assembled in accordance with manufacturer's instructions e. Repaired electrical machinery and electronic control equipment and associated safety devices, control systems and alarms are re-started/re-activated and their performance tested in accordance with manufacturer's instructions, licensing restrictions and permissible voltages f. Performance against specifications is confirmed and the electrical machinery and electronic control equipment is re-commissioned g. Coordination of the repair processes and assistance to electrical contractors to facilitate repairs is in accordance with established procedures
3. Complete maintenance and repair documentation	<ul style="list-style-type: none"> a. Required records are kept operation, testing, maintenance and repair activities and equipment failure incidents b. All planned maintenance and repair documentation is completed as required

4. Follow safety and hazard control procedures

- a. Operation and routine maintenance of electrical systems are monitored to ensure compliance with safety regulations
- b. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times
- c. Operational and maintenance hazards related to electrical systems use and basic maintenance are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment
- d. Action is taken in the event of failure or emergency to ensure the isolation and security of electrical systems and equipment and maintain the safety of the vessel and personnel involved
- e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving electrical equipment and systems

Range Of Variables

OPERATE, TEST, AND MAINTAIN MARINE ELECTRICAL AND CONTROL EQUIPMENT

VARIABLE	SCOPE
1. General context	<p>a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels.</p> <p>b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving required outcomes. It involves the operation, testing and maintenance of electrical and electronic equipment on a vessel and the application of solutions to a defined range of maintenance problems.</p> <p>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel</p>
2. Worksite environment	<p>a. Electrical machinery and electronic control equipment may include that typically found on any small commercial vessel of up to 1,500 kW propulsion power.</p> <p>b. Performance monitoring and repair of shipboard electrical machinery and electronic control equipment may be carried out</p> <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock <p>c. Types of electrical machinery and electronic control equipment may include::</p> <ul style="list-style-type: none"> c.1. main switchboard and shipboard power distribution systems including: <ul style="list-style-type: none"> c.1.1. distribution circuits and wiring c.1.2. protection devices c.1.3. circuit breakers c.1.4. a.c. motors generators and alternators c.1.5. d.c. motors and generators c.1.6. paralleling c.1.7. electronic instrumentation and power supply circuits c.1.8. emergency supply systems including emergency generators, emergency switchboard and battery banks c.2. programmable logic controllers (PLCs) c.3. signal transmission systems used for monitoring and control c.4. temperature and pressure sensors c.5. electronic PID controllers c.6. analog to digital converters c.7. electrical machinery and electronic control equipment space monitoring alarm and control systems c.8. electronic governors c.9. deck electrical machinery <p>d. Emergencies may include:</p> <ul style="list-style-type: none"> d.1. loss of electrical power d.2. short circuits and open-circuits in distribution systems d.3. loss of electronic / electrical control of systems d.4. flooding of vessel d.5. fire or explosion onboard vessel d.6. failure of emergency alarm and control systems d.7. loss of refrigeration d.8. overloading of electrical systems

Range Of Variables (continued)

OPERATE, TEST, AND MAINTAIN MARINE ELECTRICAL AND CONTROL EQUIPMENT

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>e. Testing and repair equipment may include:</p> <ul style="list-style-type: none"> e.1. electronic instrumentation meters and gauges e.2. computer displays of performance parameters e.3. hand tools, such as soldering irons, pliers, cutters, wire-strippers, spanners, wrenches, screwdrivers, hacksaws, etc. e.4. electric and pneumatic power tools, such as drills, etc. e.5. portable and manual lifting equipment including block and tackle and hydraulic jacks e.6. material safety data sheets e.7. protective clothing and equipment such as: <ul style="list-style-type: none"> e.7.1. eye and ear protection e.7.2. safety boots and helmet e.7.3. dust and fume masks e.7.4. boilersuit/overalls <p>f. Maintenance and repair hazards may include:</p> <ul style="list-style-type: none"> f.1. exposed live circuits and faulty earth connections f.2. moving heavy loads using unsafe lifting procedures f.3. unsecured machinery and equipment f.4. sharp tools and implements f.5. power tools f.6. moving and rotating electrical machinery and electronic control equipment f.7. faulty equipment, handling equipment and lifting gear f.8. using equipment beyond safe working limits f.9. poor housekeeping procedures f.10. non-compliance with safe working procedures f.11. electrical wiring and systems f.12. working at heights f.13. overspeed of electrical machinery, emergency trips
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. maintenance and repair procedures and instructions a.2. electrical machinery and electronic control equipment and vessel manufacturer's specifications, instructions and recommended procedures a.3. maintenance logs, running sheets, records a.4. vessel's survey procedures and instructions as they relate to vessel's electrical machinery and electronic control equipment a.5. vessel's safety and emergency contingency plans and procedures a.6. relevant sections of the Australian USL Code dealing with maintenance and repair
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of USL Code related to shipboard electrical machinery and electronic control equipment maintenance and repair on vessels up to 1,500 kW propulsion power a.2. relevant Australian and State/Territory OH&S and pollution control legislation a.3. requirements of relevant State/Territory electrical licensing authorities

OPERATE, TEST, AND MAINTAIN MARINE ELECTRICAL AND CONTROL EQUIPMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate and monitor the performance of electrical machinery and electronic control equipment against specifications on a small commercial vessel a.2. Identify malfunctioning and faulty electrical machinery and electronic control equipment and components within permissible voltages and initiate appropriate action for repair or replacement a.3. Make safe faulty electrical systems and equipment a.4. Trouble-shoot malfunctioning and faulty electrical machinery and electronic control equipment and carry out required repairs within the limits of responsibility of a Marine Engine Driver (Grade 1), permissible voltages and licensing authority restrictions a.5. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the operation, maintenance and repair of vessel's electrical machinery and electronic control equipment a.6. Identify typical electrical machinery and electronic control equipment maintenance and repair problems and hazards and take appropriate action a.7. Communicate effectively with others during maintenance and repair operations including effective use of internal communication systems a.8. Ensure adherence to USL Code and requirements of relevant State/Territory electrical licensing authorities
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 1).</p>
<p>3. Required knowledge and skills</p>	<p>a. Regulations of relevant State/Territory electrical licensing authorities</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><i>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel.</i></p> </div> <ul style="list-style-type: none"> b. Relevant OH&S and pollution control legislation, policies and procedures c. Procedures for carrying out shipboard electrical machinery and electronic control equipment testing, trouble-shooting and repair as part of routine maintenance procedures falling within the limits of responsibility of a Marine Engine Driver (Grade 2), including reporting of faulty machinery equipment to contractors for repair as required d. A basic understanding of the power distribution and control circuits used onboard vessels of up to 1,500 kW propulsion power and their associated operational electrical machinery and electronic control equipment e. Operational characteristics and performance specifications for the different types of electrical machinery and electronic control equipment found on a vessel up to 1,500 kW propulsion power f. The nature and causes of shipboard electrical machinery and electronic control equipment malfunctions and the available methods for their detection and repair falling within the limits of responsibility of a Marine Engine Driver (Grade 1) g. Basic characteristics and application of electrical machines t used on small vessels as they relate to the limits of responsibility of a Marine Engine Driver (Grade 1), including: <ul style="list-style-type: none"> g.1. a.c. and d.c. motors g.2. a.c. generators including requirements for the parallel operation and the process of synchronisation g.3. three phase motors g.4. three phase alternators operating singly and in parallel g.5. three phase transformers h. Basic procedures for the calibration and adjustment of transmitters and controllers in control systems i. Basic principles of analogue and digital programmable logic controllers (PLCs) as they relate to the limits of responsibility of a Marine Engine Driver (Grade 1) j. Basic theory, principles of operation and application in small vessel electrical/electronic equipment of: <ul style="list-style-type: none"> j.1. common active devices j.2. common integrated circuit devices and digital electronic circuits k. Principles and procedures for electrical measurement, including the use of relevant instruments

Evidence Guide (continued)

OPERATE, TEST, AND MAINTAIN MARINE ELECTRICAL AND CONTROL EQUIPMENT

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> l. Maritime communication techniques needed during routine maintenance operations m. Knowledge and ability to read and interpret electrical machinery and electronic control equipment performance readings and instrumentation n. Knowledge and ability to read and interpret material safety data sheets o. Principles of electrotechnology, including: <ul style="list-style-type: none"> o.1. the electric circuit o.2. basics of cabling, distribution and lighting systems typically used on a small vessel o.3. deck electrical machinery and related electronic control equipment o.4. basic electronics o.5. instruments, calibration and testing o.6. fire and emergency alarm systems. p. Knowledge and ability to read and interpret equipment specifications, drawings, and manuals q. Safety, environmental and hazard control precautions and procedures relevant to marine electrical machinery and electronic control equipment inspection and maintenance operations r. Safe procedures for the use of hand and power tools and maintenance equipment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies, simulated fault situations and other assessments that demonstrate the skills and knowledge to operate and basically test and maintain electrical machinery and electronic control equipment within permissible voltages, including the ability to identify an appropriate range of possible electrical machinery and electronic control equipment malfunctions and coordinate related maintenance and repair solutions; and/or b. Operate and basically test, maintain and repair electrical machinery and electronic control equipment in a range of operational situations on a commercial or training vessel.
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating and testing marine electrical machinery and electronic control equipment a.2 identifying shipboard electrical machinery and electronic control equipment malfunctions and faulty plant and equipment of a small vessel a.3 coordinating repairs of marine electrical machinery and electronic control equipment a.4 applying safety precautions relevant to electrical machinery and electronic control equipment maintenance and repair operations a.5 completing maintenance and repair documentation and records b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS and electrical licensing regulations b.3 manufacturers specifications and instructions for the operation, testing, maintenance and repair of electrical machinery and electronic control equipment b.4 following on-board housekeeping processes c. Action is taken promptly to report and/or rectify electrical machinery and electronic control equipment malfunctions d. Work is managed, controlled and completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MR27 01A OPERATE AND MAINTAIN MARINE INTERNAL COMBUSTION ENGINES ON VESSELS OF 750 KW PROPULSION POWER OR LESS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out routine servicing within the limits of responsibility and skill of a Marine Engine Driver (Grade 2) on marine internal combustion engines on small commercial vessels up to 750 kW propulsion power. This includes operating the engines within technical specifications, monitoring the performance of engines and propulsion machinery, recognising faults and poor performance, and reporting and rectifying faults in accordance with manufacturer's specifications and established servicing procedures.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 2).

ELEMENT	PERFORMANCE CRITERIA
1. Operate engines and propulsion systems	<ul style="list-style-type: none"> a. Propulsion system is prepared, started, and shut down in accordance with manufacturers' instructions b. Propulsion system is operated in accordance with established procedures and manufacturer's instructions and specifications c. Records of performance of propulsion system are maintained on running sheets and operations logs / computer databases in accordance with vessel's procedures
2. Carry out routine checking and servicing of propulsion systems	<ul style="list-style-type: none"> a. The performance of propulsion system is monitored in accordance with manufacturer's instructions b. Preventative and remedial service checks and procedures are conducted in accordance with procedures and manufacturer's instructions c. Poor performance and faults are identified and appropriate action initiated to report or rectify the problem within the limits of responsibility and skill level of a Marine Engine Driver (Grade 2) in accordance with and procedures and manufacturer's instructions d. Routine service checks are carried out to maintain the serviceability of the main propulsion systems in accordance with manufacturer's instructions and vessel's procedures e. Service records are completed in accordance with manufacturer's instructions and procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times when operating systems and carrying out basic servicing. b. Operational and maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Action is taken in the event of failure or emergency to isolate and secure the engine and propulsion systems and maintain the safety of the vessel and persons involved e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving an auxiliary system

Range Of Variables

MAINTAIN AND OPERATE MARINE INTERNAL COMBUSTION ENGINES ON VESSELS OF 750 KW PROPULSION POWER OR LESS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the operation and routine servicing of the engines and propulsion system on a small vessel and the application of solutions to a defined range of servicing problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel up to 750 kW propulsion power. b. Operation and servicing of engines and propulsion machinery may be conducted: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. petrol and LPG outboard motors c.2. petrol inboard engines c.3. medium and high speed diesel propulsion equipment c.4. reduction gears, gearboxes, V-drive boxes, drive legs, etc. c.5. thrust blocks and shaft bearings c.6. starting and reversing arrangements d. Auxiliary systems may include: <ul style="list-style-type: none"> d.1. hydraulic systems including electro-hydraulic steering gears d.2. pumping systems, including: <ul style="list-style-type: none"> d.2.1. lubricating oil d.2.2. fuel oil d.2.3. fresh water d.2.4. seawater e. servicing may include: <ul style="list-style-type: none"> e.1. preventative and remedial checks and basic repairs of main propulsion systems and related equipment and components e.2. lubrication of equipment in main propulsion systems e.3. routine servicing in accordance with established procedures e.4. routine visual and performance checks main propulsion systems e.5. identification of faulty equipment or fittings and arranging for repair or replacement e.6. carrying out basic repairs in accordance with established procedures f. Servicing tools and equipment may include: <ul style="list-style-type: none"> f.1. hand tools including screwdrivers, spanners, wrenches f.2. greasing and lubrication tools f.3. lifting gear and equipment f.4. protective clothing and equipment such as: <ul style="list-style-type: none"> f.4.1. eye and ear protection f.4.2. safety boots and helmet f.4.3. dust and fume masks g. Servicing and repair hazards may include: <ul style="list-style-type: none"> g.1. moving heavy loads in an unsafe work environment g.2. unsecured machinery, components or repair equipment g.3. slippery deck g.4. welding equipment g.5. sharp tools and implements g.6. power tools g.7. moving and rotating machinery g.8. flammable liquids, vapours and fuel g.9. faulty machinery equipment handling equipment and lifting gear g.10. using equipment beyond safe working limits g.11. poor housekeeping procedures g.12. non-compliance with safe working procedures g.13. hot and cold pipes and valves (steam, fuel oil, lubricating oil, refrigeration)

Range Of Variables (continued)

MAINTAIN AND OPERATE MARINE INTERNAL COMBUSTION ENGINES ON VESSELS OF 750 KW PROPULSION POWER OR LESS

2. Sources of information / documents	a. Documentation / records may include a.1. OH&S and pollution control regulations and procedures a.2. Australian USL Code a.3. company and vessel operational and maintenance procedures a.4. servicing schedules and records a.5. vessel and propulsion equipment manufacturer's instructions, specifications and recommended procedures
3. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. Relevant sections of the Australian USL Code related to the operation and maintenance of auxiliary systems on small vessels up to 750 kW propulsion power a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation a.3. relevant Australian standards

Evidence Guide

MAINTAIN AND OPERATE MARINE INTERNAL COMBUSTION ENGINES ON VESSELS OF 750 KW PROPULSION POWER OR LESS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate and service marine internal combustion engines, propulsion plant machinery against technical specifications on a vessel of up to 750 kW propulsion power a.2. Identify malfunctioning and faulty marine internal combustion engines, propulsion plant machinery and initiate appropriate action for repair or replacement a.3. Exercise all required safety, environmental and hazard control precautions and procedures when carrying out routine servicing of marine internal combustion engines, propulsion plant machinery a.4. Identify typical operational and performance evaluation problems and hazards and take appropriate action a.5. Communicate effectively with others during the operation and servicing of marine internal combustion engines, propulsion plant machinery
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation and policies b. Servicing procedures for marine internal combustion engines, propulsion plant c. Operational characteristics and performance specifications for the different types of marine internal combustion engines and propulsion machinery usually found on vessels of up to 750 kW propulsion power d. The nature and causes of typical malfunctions and/or poor performance of engines and propulsion machinery and the appropriate action that should be taken e. Hazards and problems that can occur during the operation and servicing of marine engines and propulsion machinery and appropriate preventative and remedial action and solutions f. Safety, environmental and hazard control precautions and procedures relevant to the operation and servicing of engines and propulsion machinery g. Service records that must be maintained on a vessel h. Maritime communication techniques needed during the operation and performance evaluation of engines and propulsion machinery i. Knowledge and ability to read and interpret machinery performance readings and indications j. Knowledge and ability to read and interpret operating and service manuals for propulsion equipment k. Basic principles and operational characteristics of internal combustion engines, including: <ul style="list-style-type: none"> k.1. two stroke and four stroke cycles k.2. turbo charging arrangements in engines k.3. diesel engine scavenging systems both in normal and emergency operation k.4. atmospheric pollution caused by diesel engine combustion and ways in which it can be minimised k.5. irregularities in the performance of engines and plant
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and service marine internal combustion engines and propulsion machinery on small vessels up to 750 kW propulsion power, and/or b. operate and service marine internal combustion engines and propulsion machinery on a small commercial or training vessel up to 750 kW propulsion power

Evidence Guide (continued)

MAINTAIN AND OPERATE MARINE INTERNAL COMBUSTION ENGINES ON VESSELS OF 750 KW PROPULSION POWER OR LESS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 operating marine internal combustion engines and propulsion machinery on a small vessel up to 750 kW propulsion power</p> <p>a.2 carrying out servicing of marine internal combustion engines and propulsion machinery on a small vessel</p> <p>a.3 applying safety and pollution control precautions when operating and servicing marine internal combustion engines and propulsion machinery on a small vessel</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant sections of Australian USL Code</p> <p>b.2 OHS regulations and hazard prevention policies and procedures</p> <p>b.3 job procedures and work instructions</p> <p>b.4 relevant vessel manufacturer's guidelines relating to operating and maintaining marine internal combustion engines and propulsion machinery on a small vessel</p> <p>b.5 environmental protection procedures when carrying out servicing operations</p> <p>c. Action is taken promptly to report and/or rectify issues and problems identified with operating and servicing marine internal combustion engines and propulsion machinery</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	2	2	1	1	2

TDM MR28 01A OPERATE AND MAINTAIN AUXILIARY SYSTEMS ON VESSELS UP TO 750 KW PROPULSION POWER

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out basic routine servicing within the limits of responsibility and skill of a Marine Engine Driver (Grade 2) on auxiliary systems on a small commercial vessel up to 750 kW propulsion power, including the steering gears; the lubricating oil and cooling water systems; the pumps, bilge and sea water systems; and the fuel and fuel oil systems on the vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 2).

ELEMENT	PERFORMANCE CRITERIA
1. Operate auxiliary systems	<ul style="list-style-type: none"> a. Auxiliary systems are operated in accordance with manufacturer's instructions and specifications b. Auxiliary systems are prepared, started, and shut down in accordance with manufacturers' instructions c. Records of performance are maintained on running sheets and operations logs in accordance with procedures
2. Carry out basic, routine checking and servicing of auxiliary systems	<ul style="list-style-type: none"> a. The performance of auxiliary systems is routinely monitored in accordance with manufacturer's instructions b. Poor performance and faults are identified and appropriate action initiated to report or rectify the problem within the limits of responsibility and skill of a Marine Engine Driver (Grade 2) in accordance with procedures c. Basic routine service checks and procedures are followed to maintain the serviceability of auxiliary systems in accordance with manufacturer's instructions d. Servicing records are completed in accordance with manufacturer's instructions and procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times when operating auxiliary systems and carrying out basic servicing b. Operational and servicing hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Action is taken in the event of failure or emergency to isolate and secure the engine and propulsion systems and maintain the safety of the vessel and persons involved e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving an auxiliary system

Range Of Variables

OPERATE AND MAINTAIN AUXILIARY SYSTEMS ON VESSELS UP TO 750 KW PROPULSION POWER

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the operation and routine servicing of the auxiliary systems on a small vessel and the application of solutions to a defined range of servicing problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel up to 750 kW propulsion power. b. Operation and servicing of auxiliary systems may be conducted: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. in dry dock b.7. when bunkering b.8. during cargo operations c. Auxiliary systems may include: <ul style="list-style-type: none"> c.1. steering gear, including emergency steering c.2. lubricating oil and cooling water systems c.3. pumps, bilge and sea water systems c.4. refrigeration systems c.5. fuel and fuel oil systems d. Basic servicing may include: <ul style="list-style-type: none"> d.1. routine servicing in accordance with established procedures d.2. routine visual and performance checks d.3. identification of poor performance or faults in the operation of auxiliary systems d.4. identification of faulty equipment or fittings and arranging for repair or replacement d.5. repair or replacement of faulty equipment and components d.6. application of lubricants to moving parts of equipment in auxiliary systems e. Servicing tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools including screwdrivers, spanners, wrenches e.2. lifting gear and equipment e.3. greasing and lubrication tools e.4. protective clothing and equipment such as: <ul style="list-style-type: none"> e.4.1. eye and ear protection e.4.2. safety boots and helmet e.4.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Australian USL Code a.2. company servicing procedures a.3. servicing schedules and records a.4. manufacturer's instructions, specifications and recommended procedures a.5. instructions, specifications and recommended procedures of manufacturers of servicing tools and materials
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Relevant sections of the Australian USL Code related to the operation and servicing of auxiliary systems on small vessels a.2. relevant Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

OPERATE AND MAINTAIN AUXILIARY SYSTEMS ON VESSELS UP TO 750 KW PROPULSION POWER

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate auxiliary systems on a small vessel a.2. Carry out servicing and basic repairs of auxiliary systems on a small vessel a.3. Identify typical problems related to the servicing of auxiliary systems on a small vessel and take appropriate action a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine servicing of auxiliary systems a.5. Communicate effectively with others when operating and carrying out basic servicing on auxiliary systems on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 2).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation and codes of practice b. Procedures for the operation and routine servicing of auxiliary systems on a small vessel c. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine servicing of auxiliary systems on a small vessel d. Typical problems related to the during the operation and servicing of auxiliary systems on small vessels and appropriate action and solutions e. Principle features and operating characteristics of typical steering systems and steering system components used on small vessels, including: <ul style="list-style-type: none"> e.1. rudder construction e.2. rudder types e.3. rudder and stock support bearings e.4. glands, packing and seals e.5. tiller arm attachment e.6. steering operation using hydraulic, cable and rod and gear e.7. requirements for the servicing and testing of steering and related hydraulic systems f. Principle features and operating characteristics of typical pumping systems and pumping system components used on small vessels, including: <ul style="list-style-type: none"> f.1. fire, bilge, and tank circulating systems f.2. basic fault identification and servicing procedures f.3. procedures for the prevention of corrosion in pumping systems f.4. valve types including their construction and maintenance f.5. back flooding prevention procedures f.6. strainers, mudboxes and footvalves f.7. use of flexible materials, hoses, etc. f.8. drive systems, belts, clutches, motors, etc. g. Principle features and operating characteristics of typical fuel and fuel oil systems used on small vessels, including: <ul style="list-style-type: none"> g.1. basic principles of operation of fuel and fuel oil systems g.2. hazards when working with fuel and fuel oil systems g.3. environmental issues and responsibilities concerning operation and servicing of fuel and fuel oil systems h. Principle features and operating characteristics of typical refrigeration system used on small vessels, including: <ul style="list-style-type: none"> h.1. basic principles of operation h.2. operating functions of component parts h.3. start up and shut down procedures h.4. system pump down procedures h.5. procedures for starting a system that has not pumped down correctly h.6. plant manfunctions and action that can be taken h.7. dangers of refrigerant gases and related legislation h.8. procedures for adding lubricating oil to a refrigeration compressor i. Maritime communication techniques needed during the operation and servicing of auxiliary systems on small vessels j. Servicing records that are maintained on a small commercial vessel

Evidence Guide (continued)

OPERATE AND MAINTAIN AUXILIARY SYSTEMS ON VESSELS UP TO 750 KW PROPULSION POWER

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and service auxiliary systems on small vessels falling within the limits of responsibility of Marine Engine Driver (Grade 2), and/or b. operate and carry out routine servicing on auxiliary systems on an operational small commercial or training vessel within the limits of responsibility of a Marine Engine Driver (Grade 2)
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating auxiliary systems on a small commercial vessel a.2 carrying out routine servicing of auxiliary systems on a small vessel a.3 identifying and evaluating routine operational and basic servicing problems and determining appropriate courses of action a.4 applying safety and pollution control precautions when operating auxiliary systems on a small vessel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 manufacturer's guidelines relating to operating and routine servicing of auxiliary systems on a small vessel b.5 environmental protection procedures when carrying out servicing operations c. Action is taken promptly to report and/or rectify issues and problems identified with operating and servicing auxiliary systems d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2

TDM MR29 01A OPERATE AND MAINTAIN MARINE LOW AND MEDIUM VOLTAGE ELECTRICAL SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out basic routine servicing checks within the limits of responsibility and skill level of a Marine Engine Driver (Grade 2) on electrical systems (up to 50 Volts AC and 115 Volts DC), starter motors and alternators used on a small vessel, including operation and basic maintenance of DC systems, basic care and basic maintenance of batteries and charging systems and basic operation and basic maintenance of starter motors, alternators and associated equipment.

Note: All installation, maintenance and repair of AC (50 volts or above) or DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 2).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate low and medium voltage electrical systems</p>	<ul style="list-style-type: none"> a. All relevant specifications and operating procedures are obtained b. Low and medium electrical systems are operated safely in accordance with licensing requirements and manufacturer's instructions and specifications c. The performance of low and medium voltage electrical systems is monitored in accordance manufacturer's instructions d. Poor performance and faults are identified and appropriate action initiated to report or rectify the problem in accordance with the limits of responsibility and skill of a Marine Engine Driver (Grade 2) e. Records of performance are maintained in accordance with established procedures where required
<p>2. Carry out basic maintenance on low and medium voltage electrical equipment and systems</p>	<ul style="list-style-type: none"> a. All relevant circuit diagrams, specifications and schematics are obtained b. Basic maintenance procedures are carried out in accordance with licensing restrictions and manufacturer's instructions within the limits of responsibility of a Marine Engine Driver (Grade 2) c. Poor performance and faults are investigated in accordance with manufacturer's instructions and appropriate action initiated to report or rectify the identified problem in accordance with the limits of responsibility and skill of a Marine Engine Driver (Grade 2) d. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with established procedures and regulatory requirements e. Faults in electrical systems and equipment are localised and isolated within limits of responsibility using appropriate tools, test equipment, techniques and procedures f. Repaired equipment and system is tested and re-activated in accordance with electrical regulations and manufacturer's instructions g. Appropriate action is taken within limits of responsibility to prevent damage in accordance with safety regulations and manufacturer's instructions h. Reports of maintenance activities are recorded in accordance with established procedures

3. **Follow safety and hazard control procedures**

- a. Safety and hazard minimisation procedures and regulations are followed at all times when operating and maintaining low and medium voltage electrical systems.
- b. Operational and maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment
- c. Action is taken in the event of failure or emergency to isolate and secure the electrical systems and maintain the safety of the vessel and persons involved
- d. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving low and medium voltage electrical systems

Range Of Variables

OPERATE AND MAINTAIN MARINE LOW AND MEDIUM VOLTAGE ELECTRICAL SYSTEMS

VARIABLE	SCOPE
1. General context	<p>a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels.</p> <p>b. Work is performed within operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the application of specified procedures for the operation and basic maintenance on low and medium voltage electrical systems onboard a small vessel and the application of solutions to a variety of predictable basic maintenance problems.</p> <p>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel</p>
2. Worksite environment	<p>a. Electrical systems may include those typically found on a small commercial vessel (for permissible voltage ranges: i.e. up to 50 Volts AC and 115 Volts DC).</p> <p>b. Operation and basic maintenance of onboard low and medium voltage systems may be carried out:</p> <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. while anchored or moored b.5. during maintenance operations b.6. when vessel is slipped <p>c. Basic maintenance may include:</p> <ul style="list-style-type: none"> c.1. preventative maintenance inspections, checks and procedures c.2. routine inspections of systems and equipment c.3. identification of poor performance or faulty operation c.4. identification of faulty equipment or fittings and arranging for repair or replacement c.5. basic fault-finding and repair of low and medium voltage systems within limits of responsibility <p>d. Equipment to be operated and maintained may include:</p> <ul style="list-style-type: none"> d.1. low and medium voltage AC and DC electrical distribution circuits d.2. single and three phase medium voltage electrical power systems d.3. protection devices typically used on the low and medium voltage electrical systems small vessels d.4. equipment for connection to shore power d.5. batteries and battery circuits d.6. earth indicating devices <p>e. Maintenance tools and equipment may include:</p> <ul style="list-style-type: none"> e.1. hand tools including screw drivers, pliers, cutters, soldering iron, etc. e.2. meters, tong testers, wattmeters, meggers and other relevant instrumentation e.3. protective clothing and equipment such as: <ul style="list-style-type: none"> e.3.1. eye and ear protection e.3.2. head gear and helmet e.3.3. safety boots
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. relevant State/Territory electrical licensing requirements and wiring rules a.2. maintenance records a.3. company maintenance procedures a.4. manufacturer's instructions, specifications and recommended procedures a.5. relevant Australian standards
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code related to the electrical maintenance on small vessels a.2. relevant international, Australian and State/Territory OH&S legislation a.3. relevant State/Territory electrical licensing requirements and wiring rules

OPERATE AND MAINTAIN MARINE LOW AND MEDIUM VOLTAGE ELECTRICAL SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate and carry out maintenance and checks on low and medium voltage electrical systems and associated equipment in accordance with regulatory restrictions and manufacturer's instructions a.2. Initiate and coordinate maintenance, repair or replacement of faulty or damaged equipment and components in accordance with regulatory restrictions and manufacturer's instructions a.3. Exercise all required safety, environmental and hazard control precautions and procedures during operational and maintenance operations a.4. Communicate effectively with others when carrying out operations and maintenance procedures onboard a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 2).</p>
<p>3. Required knowledge and skills</p>	<p>a. Relevant OH&S legislation and electrical regulations and wiring rules</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><i>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel.</i></p> </div> <ul style="list-style-type: none"> b. Limits of responsibility in terms of company requirements and electrical licensing requirements c. Procedures for the operation and routine maintenance of low and medium voltage electrical systems, on a small vessel falling within the limits of responsibility of a Marine Engine Driver (Grade 2), including: <ul style="list-style-type: none"> c.1. standard operating procedures for low and medium voltage electrical systems used on small vessels c.2. preventative maintenance checks and procedures c.3. the use of appropriate instrumentation when checking performance and identifying faults c.4. procedures and precautions when connecting batteries c.5. procedures for connecting a small vessel to shore power c.6. basic fault-finding techniques c.7. procedures for localising faults and isolating faulty circuits and equipment c.8. repair and replacement procedures c.9. safety precautions and hazard minimisation strategies when working on low and medium voltage electrical systems d. Safety, environmental and hazard control precautions and procedures relevant to the operation and maintenance of low and medium voltage systems and associated equipment on a small vessel e. Principles of typical low and medium voltage systems used on small vessels, including: <ul style="list-style-type: none"> e.1. basic electro-technology and electrical circuit theory (relevant to the operation and maintenance of low and medium voltage electrical systems on a small vessel) e.2. basic care and maintenance of shipboard electrical systems generally e.3. configuration of typical AC and DC low voltage electrical systems used on a small vessel e.4. batteries – types, care, maintenance, hazards and safety precautions e.5. use of protection devices including the selection of correct capacity e.6. types of starter motors and alternators typically used on small vessels e.7. series and parallel operation f. Problems related to the during the operation and maintenance of low and medium voltage systems, starter motors and alternators on small vessels and appropriate action and solutions g. Knowledge and ability to read and interpret equipment manuals, specifications and circuit diagrams h. Knowledge and ability to read and interpret machinery performance readings and indications i. Servicing records that are maintained on a small commercial vessel

Evidence Guide (continued)

OPERATE AND MAINTAIN MARINE LOW AND MEDIUM VOLTAGE ELECTRICAL SYSTEMS

4. Resource implications	<p>a. Access is required to opportunities to either:</p> <p>a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out basic routine maintenance on low and medium voltage electrical systems within the permissible voltage levels on a small vessel, and/or</p> <p>a.2. operate and carry out basic routine maintenance on low and medium voltage electrical systems within the permissible voltage levels on an operational small commercial or training vessel</p>
5. Consistency in performance	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 operating and carrying out maintenance on low and medium voltage systems</p> <p>a.2 identifying and evaluating operational and maintenance problems and determining appropriate courses of action</p> <p>a.3 applying safety precautions relevant to the operation and maintenance of low and medium voltage systems</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant sections of the Australian USL Code</p> <p>b.2 OHS regulations, pollution control and hazard prevention policies and procedures</p> <p>b.3 job procedures and work instructions</p> <p>b.4 manufacturer's guidelines relating to the operation and basic routine maintenance of low and medium voltage electrical systems</p> <p>c. Action is taken promptly to report and/or rectify issues and problems identified with the operation and basic routine maintenance of low and medium voltage systems</p> <p>d. Work is completed systematically with required attention to detail</p>
6. Context for assessment	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	1	1	1	1	2

TDM MR30 01A OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out routine basic servicing checks within the limits of responsibility and skill of a Marine Engine Driver (Grade 3) on propulsion systems on a small commercial vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
1. Operate propulsion systems	<ul style="list-style-type: none"> a. Propulsion system is operated in accordance with procedures and manufacturer's instructions and specifications b. Propulsion system is prepared, started, and shut down in accordance with manufacturers' instructions
2. Carry out basic, routine servicing procedures on propulsion systems	<ul style="list-style-type: none"> a. The operation of propulsion systems is monitored in accordance manufacturer's instructions and faulty operation reported or rectified in accordance with procedures b. Basic user service checks are carried out on propulsion system before and during operation in accordance with manufacturer's instructions and within the limits of responsibility and skill of a Marine Engine Driver (Grade 3) c. Faulty machinery and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with company procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. All required safety precaution and regulations are followed when operating and maintaining propulsion systems b. Appropriate action is taken in the event of a failure or emergency involving propulsion systems to isolate and secure the relevant equipment and the vessel and maintain the safety of the vessel and persons involved c. Emergency and contingency plans are followed in the event of a failure or emergency involving propulsion systems

Range Of Variables

OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel between 75kW and 150 kW propulsion power b. Propulsion systems may include: <ul style="list-style-type: none"> b.1. petrol and LPG outboard motors b.2. petrol inboard engines b.3. medium and high speed diesel propulsion equipment b.4. reduction gears, gearboxes, V-drive boxes, drive legs, etc. b.5. thrust blocks and shaft bearings c. Operation and basic user servicing of propulsion systems may be conducted: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather c.3. while underway c.4. during berthing and unberthing operations c.5. while anchored or moored c.6. when bunkering c.7. during cargo operations d. Basic user service checks may include: <ul style="list-style-type: none"> d.1. carrying out manufacturer's instructions for prestart checks d.2. checking shaft glands d.3. checking strainers d.4. checking cooling system d.5. visual check for oil leaks d.6. visual check, identification and reporting of obvious equipment faults
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with the operation of small vessels a.2. equipment manufacturer's instructions, specifications and procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code related to the operation of small vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate propulsion systems on a small vessel a.2. Carry out routine basic service checks of propulsion systems on a small vessel a.3. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine user servicing of propulsion systems a.4. Communicate effectively with others when operating and carrying out basic service checks on propulsion systems on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Procedures for the operation and routine basic servicing of propulsion systems on a small vessel to ensure compliance safety and pollution control rules and regulations b. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine servicing of propulsion systems on a small vessel c. Basic features and operating characteristics of propulsion systems used on small vessels d. Problems related to the operation and routine basic servicing of propulsion systems on small vessels and appropriate action and solutions e. Operational and user maintenance records that must be maintained on a small commercial vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out routine basic service checks on propulsion systems on a small vessel, and/or b. operate and carry out routine basic service checks on propulsion systems on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating propulsion systems on a small vessel a.2 carrying out basic routine servicing within the limits of responsibility and skill of a Marine Engine Driver (Grade 3) on propulsion systems on a small vessel a.3 applying safety and pollution control precautions when operating propulsion systems on a small vessel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant equipment manufacturer's guidelines relating to operating and carrying out routine service checks on engines and propulsion systems b.5 environmental protection procedures when carrying out servicing operations c. Action is taken promptly to report problems identified with operating and carrying out routine basic service checks on propulsion systems d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

6. Context for assessment	<ul style="list-style-type: none">a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulationsb. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:<ul style="list-style-type: none">b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinationsb.2. Appropriate practical assessment must occur:<ul style="list-style-type: none">b.2.1. at the registered training organisation, and/orb.2.2. on an appropriate working or training vessel
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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

TDM MR31 01A OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out routine basic servicing checks on auxiliary systems on a small commercial vessel, including the steering, pumping and any refrigeration systems on the vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
1. Operate auxiliary systems	<ul style="list-style-type: none"> a. Auxiliary systems are operated in accordance with procedures and manufacturer's instructions and specifications b. Auxiliary systems are prepared, started, and shut down in accordance with manufacturers' instructions
2. Carry out basic, routine checking and servicing procedures on auxiliary systems	<ul style="list-style-type: none"> a. The operation of auxiliary systems is monitored in accordance manufacturer's instructions and faulty operation reported in accordance with procedures b. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with company procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. All required safety precaution and regulations are followed when operating and maintaining auxiliary systems b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, ship and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Appropriate action is taken in the event of a failure or emergency involving auxiliary systems to isolate and secure the relevant equipment and the ship and maintain the safety of the ship and persons involved e. Shipboard emergency and contingency plans followed in the event of a failure or emergency involving auxiliary systems

Range Of Variables

OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small trading vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable servicing problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small trading vessel between 75kW and 150 kW propulsion power b. Auxiliary systems may include: <ul style="list-style-type: none"> b.1. steering arrangements b.2. pumping systems b.3. refrigeration systems c. Operation and basic servicing of auxiliary systems may be conducted: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather c.3. while underway c.4. during berthing and unberthing operations c.5. while anchored or moored c.6. in dry dock c.7. when bunkering c.8. during cargo operations d. Basic servicing may include: <ul style="list-style-type: none"> d.1. routine basic checks of systems and equipment d.2. identification and reporting of faults and arranging for repair or replacement e. Operation and basic servicing tasks in extra low voltage systems (up to 32 volts) may include: <ul style="list-style-type: none"> e.1. operating controls e.2. checking readings e.3. identifying faulty operation e.4. making adjustments in accordance with manufacturer's instruction f. Servicing tools and equipment may include: <ul style="list-style-type: none"> f.1. hand tools including screwdrivers, spanners, wrenches f.2. protective clothing and equipment such as: <ul style="list-style-type: none"> f.2.1. eye and ear protection f.2.2. safety boots f.2.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with small vessels a.2. vessel and company auxiliary systems servicing procedures a.3. equipment manufacturer's instructions, specifications and procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code related to the seaworthiness of vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate auxiliary systems on a small vessel a.2. Carry out routine basic servicing and checks of auxiliary systems on a small vessel a.3. Identify typical problems related to the basic servicing of a vessel and take appropriate action in conjunction with crew a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine servicing of systems a.5. Communicate effectively with others when operating and carrying out basic servicing on auxiliary systems on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures b. Procedures for the operation and routine basic servicing of auxiliary systems on a small vessel c. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine servicing of auxiliary systems on a small vessel d. Basic features and operating characteristics of auxiliary systems used on small vessels including: <ul style="list-style-type: none"> d.1. steering systems d.2. pumping systems d.3. refrigeration systems e. Problems related to the operation and routine basic servicing of auxiliary systems on small vessels and appropriate action and solutions f. Running logs and servicing records that may be kept on a small commercial vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out routine basic servicing on auxiliary systems on a small vessel, and/or b. operate and carry out routine basic servicing on auxiliary systems on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating auxiliary systems on a small vessel a.2 carrying out routine servicing on auxiliary systems on a small vessel a.3 identifying and reporting routine operational and basic servicing problems a.4 applying safety and pollution control precautions when operating auxiliary systems on a small vessel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant equipment manufacturer's guidelines relating to operating and carrying out routine servicing on auxiliary systems on a small vessel b.5 environmental protection procedures when carrying out servicing operations c. Action is taken promptly to report and/or rectify problems identified when operating and carrying out routine basic servicing on auxiliary systems d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel
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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

TDM MR32 01A OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW AND LOW VOLTAGE ELECTRICAL SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to safely operate and carry out routine basic servicing of extra low voltage and low voltage electrical systems and be aware of the safety precautions when using 50 volt systems used on a small commercial vessel, including operation and service checks of systems, basic care and servicing of batteries and charging systems and basic operation and servicing of starter motors, alternators and associated equipment.

Note: All installation, servicing and repair of AC (50 volts or above) or DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, servicing and repair of electrical circuits and systems at such voltages on a vessel

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate extra low voltage electrical systems</p>	<ul style="list-style-type: none"> a. Extra low voltage (ELV) electrical systems are safely operated in accordance with procedures and manufacturer's instructions and specifications and within the limits of responsibility of a Marine Engine Driver (Grade 3) b. Appropriate precautions are taken when operating 50Volt electrical systems in accordance with established company procedures c. Basic servicing of extra low and low voltage systems is carried out in accordance with vessel's procedures within the limits of responsibility and skill of a Marine Engine Driver (Grade 3)
<p>2. Operate and carry out basic servicing of starter motors , alternators and associated equipment</p>	<ul style="list-style-type: none"> a. The operation of starter motors, alternators and associated equipment is monitored in accordance manufacturer's instructions b. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with the limits of responsibility and skill of a Marine Engine Driver (Grade 3)
<p>3. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precaution and regulations are followed when operating and servicing extra low voltage and low voltage electrical systems and associated equipment b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, ship and the environment c. Where relevant and in consultation with relevant officers, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Appropriate action is taken in the event of a failure or emergency involving starter motors, alternators and extra low voltage electrical systems to isolate and secure the relevant equipment and the ship and maintain the safety of the ship and persons involved e. Shipboard emergency and contingency plans followed in the event of a failure or emergency involving starter motors, alternators and extra low voltage electrical systems

Range Of Variables

OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW VOLTAGE AND LOW VOLTAGE ELECTRICAL SYSTEMS

VARIABLE	SCOPE
1. General context	<p>a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels.</p> <p>b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable servicing problems falling within the limits of responsibility of a Marine Engine Driver (Grade 3).</p> <p>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel</p>
2. Worksite environment	<p>a. ELV systems may include those typically found on a small commercial vessel</p> <p>b. Operation and basic servicing of onboard ELV and LV systems may be carried out:</p> <ol style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. while anchored or moored a.5. during servicing operations a.6. when vessel is slipped <p>c. Extra low voltage and low voltage systems may include:</p> <ol style="list-style-type: none"> c.1. lead acid batteries c.2. circuit breakers c.3. wiring c.4. switches and lights c.5. starter motors and alternators <p>d. Basic servicing may include:</p> <ol style="list-style-type: none"> d.1. routine checks of systems and equipment d.2. identification and reporting of faults and arranging for repair or replacement <p>e. Typical operation and basic servicing tasks in extra low voltage systems may include:</p> <ol style="list-style-type: none"> e.1. operating main switches e.2. identifying switches e.3. changing a fuse e.4. checking and replacing a blown lamp e.5. testing and checking a battery e.6. reading basic ammeters e.7. checking navigation lights e.8. repairing loose wires e.9. identifying and fixing bad connections e.10. ensuring batteries are properly vented and there is no gas build up e.11. identifying and fixing battery leaks e.12. checking that wiring is correctly connected e.13. checking belt tension on an alternator <p>f. Servicing tools and equipment may include:</p> <ol style="list-style-type: none"> f.1. hand tools including screw drivers, pliers, cutters, soldering iron, etc. f.2. meters and instrumentation f.3. protective clothing and equipment such as: <ol style="list-style-type: none"> f.3.1. eye and ear protection f.3.2. head gear and safety boots
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ol style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with small vessels a.2. vessel and company servicing procedures for ELV systems a.3. equipment manufacturer's instructions, specifications and procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ol style="list-style-type: none"> a.1. Australian USL Code a.2. Relevant State/Territory electrical licensing requirements and wiring rules a.3. Regulations of relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW VOLTAGE AND LOW VOLTAGE ELECTRICAL SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carry out basic operation of ELV and LV electrical systems on a small vessel a.2. Carry out routine basic servicing and checks of ELV and LV electrical systems on a small vessel a.3. Identify typical problems related to the operation and basic servicing of ELV and LV systems and take appropriate action in conjunction with other officers and crew a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operational and servicing operations a.5. Communicate effectively with others when carrying out operations and servicing procedures onboard a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<p>a. Relevant OH&S legislation and policies</p> <p>b. Typical procedures for the operation and basic routine servicing of ELV and LV systems on a small vessel falling specifications and within the limits of responsibility of a Marine Engine Driver (Grade 3)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><i>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel.</i></p> </div> <p>c. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine servicing of ELV and LV systems on a small vessel</p> <p>d. Principle features and operating characteristics of typical ELV and LV systems used on small vessels, including:</p> <ul style="list-style-type: none"> d.1. basic care and servicing of shipboard electrical systems generally d.2. DC systems d.3. batteries – types, care, servicing, hazards and safety precautions d.4. procedures and precautions when connecting batteries d.5. use of fuses and circuit breakers including the selection of correct capacity d.6. types of starter motors and alternators typically used on small vessels <p>e. Procedures for isolating equipment in an ELV and LV electrical systems</p> <p>f. Typical problems related to the during the operation and basic servicing of ELV and LV systems on small vessels and appropriate action and solutions</p> <p>g. Maritime communication techniques needed during the operation and basic servicing of auxiliary systems on small vessels</p> <p>h. Types of running logs and servicing records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to</p> <ul style="list-style-type: none"> a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out routine servicing of ELV and LV systems on a small vessel, and/or a.2. operate and carry out routine servicing of ELV and LV systems on an operational small commercial or training vessel

Evidence Guide (continued)

OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW VOLTAGE ELECTRICAL SYSTEMS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 operating and carrying out basic routine servicing of ELV and LV systems a.2 identifying and evaluating operational and servicing problems and determining appropriate courses of action a.3 applying safety precautions relevant to the operation and servicing of ELV and LV systems a.4 identifying and implementing improvements to procedures for the operation and routine servicing of ELV and LV systems <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of the Australian USL Code b.2 OHS regulations, pollution control and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to the operation and basic routine servicing of ELV and LV systems <p>c. Action is taken promptly to report and/or rectify issues and problems identified with the operation and routine servicing of ELV and LV systems in accordance with manufacturer's instructions, statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MU1 01A MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

Field U Environment

DESCRIPTION:

This unit involves the skills and knowledge required to monitor compliance with international and Australian legislative requirements and measures to ensure the protection of the marine environment, including coordination of preventative and precautionary procedures, observing compliance, remedying non-compliance and maintaining relevant certification.

The unit is consistent with the related functional standards in Sections A II/2 and A III/2 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage compliance with legislative requirements for protection of the marine environment</p>	<p>a. Relevant legislative and company requirements for the protection of the marine environment are identified for the size and type of vessel concerned</p> <p>b. Appropriate measures are established and applied to prevent pollution of the marine environment in accordance with regulations and procedures</p> <p>c. Officers and crew are provided with necessary information and training to ensure compliance with regulations and procedures for the protection of the marine environment</p> <p>d. Compliance with legislative regulations and company procedures for the protection of the marine environment is monitored, and required action is taken where incidences of non-compliance are identified</p> <p>e. Any breach of regulations and procedures concerning protection of the marine environment and associated action taken in accordance with regulatory requirements and procedures are reported as required</p>
<p>2. Manage the validity of certification of shipboard items and equipment</p>	<p>a. Where relevant, the currency and validity of certificates and other documents required by Australian and/or international legislation and conventions for the protection of the marine environment are monitored and appropriate plans for their renewal and extension are developed and implemented</p> <p>b. Where relevant, the condition and operation of surveyed items and equipment are checked and appropriate action is taken to ensure continued validity of all certification relevant to the protection of the marine environment</p>
<p>3. Maintain documentation related to legislative requirements for the protection of the marine environment</p>	<p>a. Requirements for reports and other documentation related to the protection of the marine environment and any breaches of Australian and international regulations and codes are identified and interpreted</p> <p>b. All required documentation related to the protection of the marine environment and any breaches of Australian and/or international regulations and codes is completed in accordance with regulations and company requirements</p>

Range Of Variables

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations concerning protection of the marine environment. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of regulations and measures to ensure the protection of the marine environment in a wide variety of operational contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Dangers to the marine environment may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while moored or at anchor c. Items and equipment surveyed under certification to protect the marine environment may include: <ul style="list-style-type: none"> c.1. pumps c.2. valves c.3. emission control equipment c.4. water management equipment including: cooling water, ballast water and bilge systems c.5. waste storage and recycling equipment c.6. ballast management equipment d. Measures to protect the marine environment may include:: <ul style="list-style-type: none"> d.1. prevention of spillages of cargo d.2. prevention of spillages of fuel and oil d.3. control of polluting emissions of gas and smoke d.4. effective management of waste, pollution and recycling processes d.5. effective management of ballast operations d.6. shipboard housekeeping d.7. pollution control instructions
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. relevant regulations for the type of vessel involved a.3. company procedures related to the protection of the marine environment a.4. equipment manufacturer's instructions and recommended procedures a.5. instructions of relevant Maritime Authorities a.6. vessel's log where relevant a.7. certificates and other documents required by regulations for the protection of the marine environment a.8. relevant standards related to the protection of the marine environment
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Dependent on the size and range of service of the vessel, applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to protection of the marine environment a.2. relevant sections of AMSA Marine Orders related to protection of the marine environment a.3. relevant sections of the Australian USL Code related to protection of the marine environment a.4. MARPOL Convention a.5. relevant international, Australian and/or State/Territory legislation related to protection of the marine environment

Evidence Guide

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Maintain compliance with legislative requirements for protection of the marine environment a.2. Maintain currency and validity of all required certification and documentation concerning protection of the marine environment a.3. Identify typical pollution control problems and take appropriate action a.4. Communicate effectively with others concerning measures to protect the marine environment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of a master, engineer or marine engine driver on a commercial vessel with responsibilities for ensuring compliance with pollution control measures.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant legislation and policies to protect the marine environment b. Effects on the marine environment of various possible pollution incidents c. Typical pollution control problems and related measures to protect the marine environment d. Certificates and other documents required by relevant Australian and/or international legislation and conventions for the protection of the marine environment e. Maritime communication techniques and processes for maintaining currency and validity of surveyed items and equipment f. Features and operational characteristics of emission control equipment typically used on vessels of various types g. Operational requirements of water, bilge, waste, pollution and recycling management processes on vessels as appropriate h. Regulations for reporting incidents related to breaches of the statutory codes and measures for the protection of the marine environment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably-simulated activities aimed at the protection of the marine environment covering a range of situations typically experienced on a vessel and/or b. contribute to measures to protect the marine environment on a vessel in an appropriate range of situations, weather and loading conditions
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 completing activities aimed at compliance with legislative requirements for protection of the marine environment a.2 identifying and evaluating problems related to the aimed at compliance with legislative requirements for environmental protection and determining an appropriate courses of action a.3 identifying and implementing improvements to environmental protection measures a.4 assessing compliance of vessel with legislative requirements for protection of the marine environment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Relevant regulatory requirements dealing with environmental protection b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions related to environmental protection b.4 following on-board housekeeping processes b.5 waste, pollution and recycling management processes, where relevant c. Action is taken promptly to report and/or rectify breaches of environmental protection regulations and conventions in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2

TDM MU4 01A ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

Field U Environment

DESCRIPTION:

This unit involves the skills and knowledge required to ensure compliance with international and Australian legislative requirements and measures to ensure the protection of the marine environment, including preventative and precautionary procedures, checking of compliance and remedying non-compliance.

The unit is consistent with the related functional standard in Sections A II/2 and AIII/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2 and Appendix 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Maintain compliance with legislative requirements for protection of the marine environment</p>	<p>a. Relevant regulations and procedures for the protection of the marine environment are identified</p> <p>b. Appropriate action is taken in day-to-day work to ensure compliance with relevant regulations and procedures for the protection of the marine environment as required</p> <p>c. Appropriate action is taken where incidences of non-compliance or potential non-compliance are identified in accordance with regulations and procedures</p> <p>d. Any breach of regulations and procedures concerning protection of the marine environment is rectified and/or reported as required within the limits of the officer's responsibility</p>
<p>2. Implement anti-pollution procedures</p>	<p>a. Anti-pollution procedures applicable to vessel operations are followed in the course of day-to-day work</p> <p>b. Appropriate preventative measures are implemented to prevent pollution of the marine environment in accordance with regulations and procedures</p>
<p>3. Maintain documentation related to legislative requirements for the protection of the environment</p>	<p>a. Requirements for reports and other documentation related to the protection of the marine environment and any breaches of relevant regulations are identified and interpreted as required</p> <p>b. All required documentation related to the protection of the marine environment and any breaches of environmental regulations is completed in accordance with regulations and procedures</p>

Range Of Variables

ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

VARIABLE	SCOPE
1. General context	<p>a. Work must be carried out in compliance with the relevant Work must be carried out in compliance with mandatory rules and regulations concerning protection of the marine environment.</p> <p>b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of regulations and measures to ensure the protection of the marine environment in a wide variety of operational contexts.</p>
2. Worksite environment	<p>a. Vessel may include any Australian or international commercial vessel</p> <p>b. Dangers to the marine environment may occur:</p> <p>b.1. by day or night in both normal and emergency situations</p> <p>b.2. under any possible conditions of sea and weather</p> <p>b.3. while underway</p> <p>b.4. during berthing and unberthing operations</p> <p>b.5. while anchoring or mooring</p> <p>b.6. while moored or at anchor</p> <p>b.7. during loading and unloading operations</p> <p>b.8. during maintenance operations</p> <p>c. Items and equipment which may be checked as part of anti-pollution measures include:</p> <p>c.1. pumps</p> <p>c.2. valves</p> <p>c.3. emission control equipment</p> <p>c.4. water management equipment including: cooling water, ballast water and bilge systems</p> <p>c.5. waste storage and recycling equipment</p> <p>c.6. ballast management equipment</p> <p>d. Preventative measures to protect the marine environment may include::</p> <p>d.1. prevention of spillages of cargo</p> <p>d.2. prevention of spillages of fuel and oil</p> <p>d.3. control of polluting emissions of gas and smoke</p> <p>d.4. effective management of waste, pollution and recycling processes</p> <p>d.5. effective management of ballast operations</p> <p>d.6. shipboard housekeeping</p> <p>d.7. pollution control instructions</p>
3. Sources of information / documents	<p>a. Documentation / records may include</p> <p>a.1. operational orders</p> <p>a.2. relevant regulations for the type of vessel involved</p> <p>a.3. company procedures related to the protection of the marine environment</p> <p>a.4. equipment manufacturer's instructions and recommended procedures</p> <p>a.5. instructions of relevant Maritime Authorities</p> <p>a.6. vessel's log where relevant</p> <p>a.7. certificates and other documents required by regulations for the protection of the marine environment</p> <p>a.8. relevant standards related to the protection of the marine environment</p>
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Dependent on the type, size and range of service of the vessel, applicable procedures and codes may include</p> <p>a.1. IMO STCW 95 Code and Convention related to protection of the marine environment</p> <p>a.2. relevant sections of AMSA Marine Orders related to protection of the marine environment</p> <p>a.3. the Australian USL Code related to protection of the marine environment</p> <p>a.4. MARPOL Convention</p> <p>a.5. relevant international, Australian and/or State/Territory legislation related to protection of the marine environment</p>

Evidence Guide

ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Maintain compliance with legislative requirements for protection of the marine environment a.2. Implement preventative and remedial anti-pollution procedures as per relevant regulations and procedures a.3. Identify typical pollution control problems and take appropriate action a.4. Maintain all records concerning anti-pollution measures and breaches of anti-pollution regulations a.5. Communicate effectively with others concerning measures to protect the marine environment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of a master, engineer or marine engine driver on a commercial vessel with responsibilities for ensuring compliance with pollution control measures.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant legislation, codes of practice, policies and procedures to protect the marine environment b. Effects on the marine environment of various possible pollution incidents c. Pollution control problems and related measures to protect the marine environment d. Certificates and other documents required by relevant Australian and/or international legislation and conventions for the protection of the marine environment e. Operational characteristics of emission control equipment typically used on various types and sizes of vessels f. Operational requirements of water, bilge, waste, pollution and recycling management processes used on various types and sizes of vessels g. Requirements under Australian and/or international legislation and conventions for reporting incidents related to breaches of the statutory codes and measures for the protection of the marine environment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably-simulated activities aimed at the protection of the marine environment covering an appropriate range of situations experienced on a vessel and/or b. contribute to measures to protect the marine environment on a vessel in an appropriate range of situations, weather and loading conditions
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. completing activities aimed at compliance with relevant regulatory requirements for protection of the marine environment a.2. identifying and evaluating problems related to compliance with relevant regulations for environmental protection and determining an appropriate courses of action a.3. following anti-pollution procedures a.4. assessing compliance of vessel with relevant regulatory requirements for protection of the marine environment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. Relevant regulatory requirements dealing with environmental protection b.2. OHS regulations and hazard prevention policies and procedures b.3. job procedures and work instructions related to environmental protection b.4. following on-board housekeeping processes b.5. waste, pollution and recycling management processes, where relevant c. Action is taken promptly to report and/or rectify breaches of environmental protection regulations d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	2	1	2	2

TRANSPORT AND DISTRIBUTION TRAINING PACKAGE

Maritime Industry Sector

Contextualisation Statement

The following *Contextualisation Statement* is provided as an aid to trainers, assessors and others who need to apply cross-industry standards and standards from other industries in *Maritime Industry Sector* contexts. It provides additional information in the form of a 'General Description', 'Range of Variables' and an 'Evidence Guide' to assist those interpreting the standards to understand critical aspects of the maritime context including the types of vessels, equipment, tools and procedures involved, and critical underpinning knowledge and skills particularly related to safety management issues and compliance with maritime regulatory requirements and codes

The statement should be read in conjunction with the existing Ranges of Variables and Evidence Guides of the competency units concerned. The additional information should be used to ensure that training programs and assessment processes based on the standards, and designed for use with Maritime Sector trainees and staff, relate meaningfully to the key aspects and requirements of the Maritime Sector context.

GENERAL DESCRIPTION OF THE MARITIME SECTOR CONTEXT

The maritime industry sector differs from many other industry sectors in a variety of ways:

- Vessels may operate in remote locations out of direct contact with land and support services, requiring higher levels of operational reliability, safety and efficiency and a capacity to carry out emergency repairs if required
- Safety of personnel and the vessel is of central importance and is the focus of extensive international, national and State/Territory maritime regulations, particularly the prevention and control of emergencies such as collision and fire and the need for effective emergency procedures and drills
- Officers and crew form a close community in a restricted space over long periods of time requiring extensive teamwork and attention to human relationships on board a vessel
- Prevention of injury and illness amongst passengers and crew is especially important because of the relative isolation and remoteness of a vessel at sea. This requires especial attention to matters of food and personal hygiene
- The language and terminology of the Maritime Sector is different to other industry sectors (e.g. 'deck' versus 'floor', 'port hole' versus 'window', 'galley' versus 'kitchen', 'cabin' versus 'room', etc.)
- The watertight integrity of a vessel is vital for the safety of personnel on board a vessel and is the subject of special attention during maritime operations and maintenance
- The legal aspects of maritime operations tend to be different to that in other industry sectors, with the Master and Officers of a vessel having higher levels of legal responsibilities and authority than in most other industries. This has implications for the chain of command, the way in which command decisions are made, and how orders are given and followed on board a vessel.
- Communications with land bases and other vessels is of crucial importance for vessels (requiring the use of VHF, HF and GMDSS radio and various visual signalling processes)
- Vessels may be called upon to play an active role in air / sea search and rescue operations

Range Of Variables

VARIABLE	SCOPE
<p>1. General context <i>as it applies to the competency unit concerned</i></p>	<p>a. Work must be carried out in compliance with the relevant maritime regulations.</p> <p>a.1. Where vessels operate within international waters and other unrestricted contexts, this will generally include AMSA Marine Orders and relevant IMO Codes and Conventions including STCW 95, ISM Code (concerning integrated safety management on board vessels), SOLAS Convention (concerning safety of life at sea), MARPOL Convention (concerning pollution of the marine environment) Convention and the IAMSAR Convention (concerning aeronautical and maritime search and rescue)</p> <p>a.2. Where vessels operate within near coastal and inshore waters and other restricted contexts, this will generally include State/Territory marine regulations administered by the relevant State/Territory marine authority. Consistency between the various State/Territory regulations is achieved through the Australian Uniform Shipping Laws (USL) Code administered by the National Maritime Safety Committee. As at August, 2000, the current USL Code is currently being reviewed in consultation with the maritime industry and the marine authorities in the States and Territories.</p> <p>b. Work is performed under appropriate level of supervision, generally within a team environment.</p> <p>c. Vessels may include Australian and international vessels ranging from small commercial vessels of less than 12 metres in length to large commercial vessels in excess of 500 gross tonnage and/or 3,000 kW propulsion power. This includes a range of specialist vessels including roll-on roll-off passenger and cargo vessels, oil, chemical and gas tankers, high speed vessels which require additional specialised skills for safe operation, navigation and maintenance.</p> <p>d. All personnel working on commercial maritime vessels regardless of their occupation or position on the vessel are required to have received training and be competent in skills and knowledge required to:</p> <ul style="list-style-type: none"> • contribute to effective human relationships on board a vessel • understand orders and be understood in relation to shipboard duties • observe safe working practices • comply with emergency procedures • provide first aid • survive at sea in the event of vessel abandonment • minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire • fight and extinguish fires
<p>2. Worksite environment may include <i>as it applies to the competency unit concerned</i></p>	<p>a. Operations will usually need to be conducted by day or night in all possible weather and sea conditions.</p> <p>b. Key equipment may include:</p> <p>b.1. bridge systems, equipment, indicators and controls</p> <p>b.2. engine room systems, equipment, indicators and controls</p> <p>b.3. auxiliary systems, equipment, indicators and controls</p> <p>b.4. deck machinery and systems</p> <p>b.5. galley and catering/accommodation areas</p> <p>b.6. hull and propulsion system</p> <p>c. Fault conditions and related fault finding and diagnostic techniques may include those relevant to the standard concerned and required for safe, efficient and effective vessel operations.</p> <p>d. Scope of units included in the Maritime Sector of the Training Package encompasses all maritime 'commercial' vessels and operations covered by Australian and international Maritime regulations, conventions and codes</p> <p>e. Customer service standards may include those relevant to the standard concerned and specified by vessel owners for the comfort, convenience and safety of their passengers and customers.</p> <p>f. Tools and instrumentation may include those relevant to the standard concerned and needed to safely, efficiently and effectively carry out the maintenance and operational activities necessary in a well-functioning vessel</p> <p>g. Safety hazards and hazard prevention measures will include all those specified in statutory and organisational requirements for occupational health and safety and the safe operation of a vessel including compliance with ISM Code safety management system</p>

<p>3. Sources of information / documents <i>as they apply to the competency unit concerned</i></p>	<p>a. Documentation / records may include:</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW Convention and Code a.5. AMSA Marine Orders a.6. IMO SOLAS Convention a.7. IMO MARPOL Convention a.8. IMO/ICAO IAMSAR Convention a.9. vessel's log a.10. maintenance records a.11. safety incident reports a.12. company procedures a.13. vessel / equipment manufacturer's instructions and recommended procedures a.14. annual and weekly notices to mariners a.15. instructions of relevant Maritime Authorities a.16. pilot instructions where relevant a.17. relevant Australian and international standards <p>b. Documentation / records may be in the form of:</p> <ul style="list-style-type: none"> b.1. hard copy procedures and instructions b.2. computer files / records b.3. forms and pro-forma reports b.4. operating and maintenance manuals
<p>4. Workplace context</p>	<p>a. The workplace context of a vessel is defined by:</p> <ul style="list-style-type: none"> a.1. Maritime Sector work organisation, procedures and practices a.2. Relevant maritime regulations a.3. Conditions of service, legislation and industrial agreements including: <ul style="list-style-type: none"> a.3.1. Maritime Industry workplace agreements and awards a.3.2. State, Federal or Territory legislation and related regulations as they apply to maritime operations
<p>5. Applicable State/ Territory/ Commonwealth regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules a.2. International Regulations for Preventing Collisions at Sea a.3. IMO SOLAS Convention a.4. IMO MARPOL Convention a.5. IMO/ICAO IAMSAR Convention a.6. relevant regulations of State/Territory marine authorities a.7. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

<p>1. Critical aspects of evidence to be considered <i>(as they apply to the competency unit concerned)</i></p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. operate in compliance with all safety, OHS and other statutory and organisational requirements applying to a vessel. a.2. interpret and communicate operational information a.3. complete all required procedures for the start up, operation and shut down of relevant equipment and systems a.4. manoeuvre and position vessels where required a.5. respond appropriately to emergencies, safety alarms and indicators a.6. operate, maintain and service a vessel's machinery, equipment, tools and instruments and equipment, as required a.7. complete all documentation relevant to the functions of the person concerned
<p>2. Interdependent assessment of units</p>	<p>a. The unit of competency may be assessed in conjunction with other units that form part of a job role of the person concerned. This may include units from both Maritime Sector and other relevant Training Packages</p>
<p>3. Required knowledge and skills <i>(as they apply to the competency unit concerned)</i></p>	<p>a. Knowledge of maritime systems and equipment may include:</p> <ul style="list-style-type: none"> a.1. principles, purpose and location of equipment controls a.2. operating procedures and control functions a.3. correct use of performance monitoring devices a.4. correct use of safety equipment a.5. ancillary system procedures a.6. complying with operational limits a.7. adjustment for safe and effective operation a.8. managing hazardous operational and maintenance situations <p>b. Knowledge of vessel construction, layout and subdivision requirements may include an understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead:</p> <ul style="list-style-type: none"> c. Maritime Sector documentation requirements and procedures d. ISM Code management safety systems, procedures and requirements e. Company and vessel policies and procedures f. OH&S legislation, codes of practice, policies and procedures g. Maritime Sector communication techniques and requirements h. Working as part of a team on board a vessel
<p>4. Resource implications</p>	<p>a. Access is required to relevant maritime vessels, equipment, and operational situations in a real or appropriately simulated Maritime Sector environment.</p>
<p>5. Consistency in performance</p>	<p>a. Applies relevant underpinning Maritime Sector knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. completing tasks a.2. identifying improvements a.3. applying safety precautions relevant to the task a.4. assessing operational capability of equipment used and work processes selected <p>b. Shows evidence of application of relevant Maritime Sector workplace procedures including:</p> <ul style="list-style-type: none"> b.1. hazard policies and procedures, including ISM Code safety management systems and procedures b.2. issue resolution procedures b.3. job procedures and work instructions b.4. relevant guidelines relating to the use of machinery and equipment capability and limitations b.5. security procedures b.6. following enterprise housekeeping processes b.7. waste, pollution and recycling management processes <p>c. Action taken promptly, accidents and incidents reported in accordance with Statutory requirements and established Maritime Sector / vessel procedures</p> <p>d. Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among staff and others</p> <p>e. Work completed systematically with attention to detail without damage to goods, equipment or facilities.</p>

6. Context for assessment

- a. Assessment of a Maritime Sector or cross-industry competency unit must include approved arrangements for the assessment of knowledge and practical competence
- b. Assessment of knowledge may occur:
 - b.1. at a recognised maritime training institution and/or
 - b.2. concurrently with practical assessment
 - b.2.1. through appropriately simulated role plays, case studies and assessment exercises and/or
 - b.2.2. during seetime on a working or training vessel
- c. Practical assessment may occur:
 - c.1. through appropriately simulated role plays, case studies and assessment exercises and/or
 - c.2. during seetime on a working or training vessel
- d. Assessment of competence must comply with the requirements of relevant maritime regulations

CROSS INDUSTRY UNITS SUGGESTED AS RELEVANT FOR THE MARITIME INDUSTRY TRAINING PACKAGE WITH APPROPRIATE CONTEXTUALISATION

Note that this is not an exhaustive list and that cross industry units from other Industry Training Packages may be identified and used within Maritime Qualifications to meet the needs of persons working in specific enterprises or maritime contexts

Yachting (Small Boat) *(from National Outdoor Recreation Industry Training Package)*

SRO YSB 001A	Use basic skills to sail a small boat in controlled conditions
SRO YSB 002A	Sail a small boat in light to moderate conditions using enhanced skills
SRO YSB 003A	Sail a small boat in moderate conditions using enhanced skills

Seafood Vessel Operations *(from Seafood Industry Training Package)*

SFICORE 104A	Meet workplace health and safety requirements
SFISHIP 211A	Take emergency action on board a vessel
SFISHIP 202A	Contribute to safe navigation

Commercial cookery and catering *(from Hospitality Training Package)*

THHCOR01A	Work with colleagues and customers	THBCC05A	Prepare and cook poultry and game
THHCOR02A	Work in a socially diverse environment	THBCC06A	Prepare and cook seafood
THHCOR03A	Follow health, safety and security procedures	THBCC07A	Identify and prepare meat
THHBKA01A	Organise and prepare food	THBCC08A	Prepare hot and cold desserts
THHBKA02A	Present food	THBCC09A	Prepare pastry, cakes and yeast goods
THHBKA03A	Receive and store stock	THBCC10A	Plan and prepare food for buffets
THHBKA04A	Clean and maintain premises	THBCC11A	Implement food safety procedures
THHBCC01A	Use basic methods of cookery	THIEBCC12A	Prepare diet based and preserved foods
THHBCC02A	Prepare appetisers and salads	THBCC13A	Plan and control menu-based catering
THHW02aA	Prepare sandwiches	THBCC14A	Organise bulk cooking operations
THHADCC02A	Plan, prepare and display a buffet	THBCC15A	Organise food service operations
THHADCC04A	Prepare portion controlled meat cuts	THS2CC1A	Monitor catering revenue and costs
THHADCC05A	Handle and serve cheese	THS2CC2A	Establish and maintain quality control
THHBCC03A	Prepare stocks and sauces	THS2CC3A	Develop a food safety plan
THBCC03aA	Prepare soups	THBCAT01A	Prepare foods according to specific dietary and cultural needs
THBCC04A	Prepare vegetables, eggs and farinaceous dishes		

Security *(from Hospitality Training Package)*

THHBTHS01A	Maintain the security of premises and property	THHBTHS08A	Escort and carry valuables
THHBTHS02A	Determine and use reasonable security force to control access to and exit from premises	THHBTHS09A	Control crowds
THHBTHS03A	Maintain safety of premises and personnel	THHBTHS11A	Interpret information from advanced security equipment
THHBTHS04A	Manage intoxicated persons	THHBTHS12A	Operate central monitoring/communication station
THHBTHS05A	Operate basic security equipment	THHBTHS16A	Provide lost and found facility
THHBTHS06A	Apprehend offenders	THHBTHS17A	Observe and monitor people
THHBTHS07A	Screen baggage and people to minimise security risk	THHADTHS01A	Plan and conduct evacuation of premises
		THHADTHS02A	Provide for safety of VIPS

Housekeeping *(from Hospitality Training Package)*

THHBH01A	Provide housekeeping services to guests	THHBH0314A	Prepare rooms for guests
THHBH02A	Clean premises and equipment	THHBH05A	Launder linen and guest clothes
		THHBH06A	Provide valet service

Engineering *(from Metal and Engineering Training Package)*

MEM 18.1 A	Use hand tools	MEM 5.6 A	Perform brazing and/or silver soldering
MEM 18.2 A	Use power tools/hand held operations	MEM 5.7 A	Manual heating thermal cutting and gouging
MEM 5.1 A	Manual soldering / desoldering electrical. electronic components	MEM 5.15 A	Weld using manual metal arc welding process
MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)	MEM 7.5 A	Perform general machining

Training and Assessment *(from Assessors and Workplace Trainers Training Package)*

BSZ401A*	Plan assessment	BSZ502A	Design and establish the training system
BSZ402A *	Conduct assessment	BSZ503A	Design and establish the assessment system
BSZ403A*	Review assessment	BSZ504A	Manage the training and assessment system
BSZ404A	Train small groups	BSZ505A	Evaluate the training and assessment system
BSZ405A	Plan and promote a training program	BSZ506A	Develop assessment procedures
BSZ406A	Plan a series of training sessions	BSZ507A	Develop assessment tools
BSZ407A	Deliver training sessions	BSZ508A	Design training courses
BSZ408A	Review training		
BSZ501A	Analyse competency requirements		

* These units will be considered as one unit towards a qualification within this training package.

Transport *(from Transport and Distribution Training Package)*

TDT RB11 98A	Maintain and use basic hand tools	TDT J2 97A	Apply quality systems
TDT D1 97A	Shift materials safely	TDT K1 97A	Use computer applications
TDT D2 97A	Use manual handling equipment	TDT K3 97A	Apply keyboard skills
TDT D3 98A	Handle hazardous substances/dangerous goods	TDT RL1 98A	Monitor and process attendance records
TDT RE2 98A	Work with travel agencies and sales outlets	TDT RL2 98A	Implement equal employment equity strategies
TDT E1 97A	Present workplace information	TDT RL3 98A	Promote effective workplace practice
TDT E3 97A	Participate in workplace communication	TDT L1 97A	Complete induction procedures
TDT E4 97A	Prepare workplace documents	TDT L3 97A	Conduct induction process
TDT E5 97A	Carry out workplace calculations	TDT O11 98A	Provide revenue protection measures
TDT E8 97A	Process workplace documentation	TDT O12 98A	Manage disruptive and/or unlawful behaviour
TDT RF1 98A	Investigate safety incidents	TDT O13 98A	Administer the security of assets and facilities
TDT F8 97B	Provide first aid in the workplace	TDT RQ1 98A	Maintain customer credit accounts and services
TDT G1 97A	Work effectively with others	TDT RQ2 98A	Maintain petty cash account
TDT G2 97A	Lead work team or group	TDT RQ3 98A	Sell products and services
TDT I2 97B	Apply customer service skills		
TDT J1 97A	Apply quality procedures		

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INTRODUCTION

The 2001 version of the Maritime Training Package is in addition to the previous Transport and Distribution Training Package developed by TDT, which includes the following:

- Road Transport Competency Standards and Qualifications
- Warehousing Competency Standards and Qualifications
- Stevedoring Competency Standards and Qualifications
- Rail Operations Competency Standards and Qualifications
- Rail Passenger Services Competency Standards and Qualifications
- Rail Freight Services Competency Standards and Qualifications
- Rail Civil Infrastructure Competency Standards and Qualifications

Each Competency Standards manual includes the framework that details the requirements for completion of a qualification, under the Australian Qualification Framework.

It is important that this manual be used in conjunction with the Assessment Guidelines. Users should also reference the Australian Recognition Framework.

The Maritime Sector acknowledges the need to apply selected cross industry standards and standards from other industries. These have not been fully reproduced in this Training Package. These standards are listed at the end of this document. To ensure currency and correct usage, Registered Training Organisations and Enterprises wishing to include these standards in the development of a qualification are required to source the latest version of the standards from the original developer. Further the standards are only to be used in building Maritime qualifications at the comparable AQF level of the original standards and qualification. A maritime contextualisation statement is also contained at the end of this manual. The statement should be read in conjunction with the existing Range of Variables and Evidence Guides of competency units concerned. The additional information in the contextualisation statement should be used to ensure that training programs and assessment processes based on the standards, and designed for use with Maritime sector trainees and staff relate in a meaningful way to key aspects and requirements of the Maritime sector context, particularly safety management and the protection of the marine environment.

The Maritime Training Package is subject to continuous revision. It is suggested that users confirm the status of this manual prior to use. Confirmation can be given from:

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AUSTRALIAN QUALIFICATIONS FRAMEWORK

The Maritime Training Package provides significant flexibility to Registered Training Organisations, enterprises and individuals in packaging units together which lead to a qualification.

This level of flexibility reflects the multiple job roles, enterprise requirements and changing technological nature of the industry. It is expected however that users of this Training Package select units, which packaged together, provide a coherent qualification, inclusive of all the competencies necessary to fulfil occupation requirements.

Importantly, the flexibility of packaging available within the qualifications framework must be considered within the responsibility of individuals, enterprises and/or Registered Training Organisations to package units together to meet legislative requirements and industry codes of practice necessary at an occupational level.

In packaging units together to form a training program, users should be aware of requirements set out in the Maritime Assessment Guidelines, and the Australian Recognition Framework. The qualification framework within this manual provides the units available within each qualification level and requirements for completion of a qualification.

MARITIME SECTOR QUALIFICATIONS

The Maritime qualifications are summarised in the tables on the following pages. The qualifications reflect the competency requirements for the occupational pathways of integrated ratings, deckhands, marine engine drivers, marine engineers and deck officers working on board vessels operating in international and Australian coastal and inshore waters.

The qualifications and the component competency units have been carefully designed in conjunction with Maritime Sector advisors to align closely with the regulatory requirements and framework of the various National, State and Territory marine authorities. As appropriate, cross-industry units from other industry training packages may be incorporated into the qualifications to meet specific enterprise needs. Details of a number of cross-industry units are provided in this booklet together with a maritime sector contextualisation statement. This list of cross-industry units is not exhaustive however. Registered Training Providers and enterprises may identify a need to use other cross-industry units not on the list. In such cases, TDT Australia should be contacted to confirm the appropriateness of the proposed inclusion.

Care needs to be taken by Registered Training Organisations when structuring qualifications that trainees are not only prepared and assessed for qualifications within the Australian Qualifications Framework but also the relevant certification requirements of the Australian Maritime Safety Authority and/or the relevant State/Territory marine authorities. Registered Training Organisations are advised to refer to the relevant marine authorities to confirm certification requirements, as well as requirements of marine authorities for training providers involved in training and competency assessment for the marine sector.

This Qualifications Framework does not have specific qualifications for **marine cooks**, although some catering competency units may be incorporated into the maritime sector qualifications through the cross-industry unit provisions outlined above. Marine Cooks would usually complete the relevant qualifications in the Hospitality Industry Training Package administered by Tourism Training Australia. Nonetheless, persons involved in marine cooking and catering will still need to fulfil the mandatory pre-sea competency requirements of all sea-going personnel as covered by the following maritime competency units and the related certification requirements of the relevant marine authorities:

- TDM ME01 01A Understand orders and be understood in relation to shipboard duties
- TDM MF07 01A Observe safe working practices
- TDM MF08 01A Comply with emergency procedures
- TDM MF09 01A Fight and extinguish fires
- TDM MF10 01A Provide first aid
- TDM MF11 01A Survive at sea in the event of vessel abandonment
- TDM MF12 01A Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDM ML02 01A Contribute to effective human relationships on board a vessel

It should be noted that in both training and assessment units TDM MF8 00A 'Comply with emergency procedures', TDM MF09 00A 'Fight and extinguish fires', TDM MF11 00A 'Survive at sea in the event of vessel abandonment', and TDM MF12 00A 'Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire' will usually be covered holistically by Registered Training Organisations during training and assessment as 'elements of shipboard safety'. This combination of units is equivalent to unit SFISHIP 211A 'Take emergency action on board a vessel' in the Seafood Industry Training Package.

Maritime Sector Qualifications Framework

DECK OPERATIONS

AQF	SUGGESTED QUALIFICATION TITLE	PROFILES COVERED		
		<i>MARITIME FUNCTIONAL CATEGORY</i>		
		<i>Management</i>	<i>Operational</i>	<i>Support</i>
AQF 6	Advanced Diploma in Transport and Distribution (Maritime Operations)	Master (Class 1) and (Class 2)	Chief Mate	
AQF 5	Diploma in Transport and Distribution (Maritime Operations)	Master (Class 3)	Off in charge of Nav Watch	
AQF 4	Certificate IV in Transport and Distribution (Maritime Operations)	Master (Class 4)		
AQF 3	Certificate III in Transport and Distribution (Maritime Operations)	Master (Class 5)	Coxswain (+options)	Integrated Rating
AQF 2	Certificate II in Transport and Distribution (Maritime Operations)		Coxswain (basic)	GP Deckhand (+ options)
AQF 1	Certificate I in Transport and Distribution (Maritime Operations)			GP Deckhand (basic) Basic entry skills

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate I in Transport & Distribution (Maritime Operations)

Rationale:

An entry level qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 1.

"Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities most of which may be routine and predictable. Applications may include a variety of employment-related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group."

Qualification Contents:

FIELD		UNIT	
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
F	Operational Quality and Safety	TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
R	Carry Out Operations on Equipment and Systems	TDM MR43 01A	Assist in mooring and anchor handling activities

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 1 unit chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

It should be noted that training and assessing units TDT MF8 00A 'Comply with emergency procedures', TDT MF9 00A 'Fight and extinguish fires', TDT MF11 00A 'Survive at sea in the event of vessel abandonment', and TDT MF12 00A 'Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire' will usually be covered holistically by Registered Training Organisations during training and assessment of 'elements of shipboard safety'. This combination of units is equivalent to unit SFISHIP 211A 'Take emergency action on board a vessel' in the Seafood Industry Training Package.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate II in Transport & Distribution (Maritime Operations)

Rationale:

An operational qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned AQF Level 2.

"Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes. Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team."

Qualification Contents:

FIELD	UNIT		
C	Manoeuvring	SRO YSB 001A	Use basic skills to sail a small boat in controlled conditions
		SRO YSB 002A	Sail a small boat in light to moderate conditions using enhanced skills
		SRO YSB 003A	Sail a small boat in moderate conditions using enhanced skills
B	Equipment Checking and Maintenance	TDM MB6 01A	Monitor condition and seaworthiness of a small vessel
C	Manoeuvre Vessel	TDM MC7 01A	Apply seamanship skills and techniques when operating a small vessel
		TDM MC9 01A	Manoeuvre a vessel less than 12 metres in length within inshore limits
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
		TDM ME5 01A	Transmit and receive information by marine radio or telephone
F	Operational Quality and Safety	TDM MF2 01A	Respond to navigational emergencies
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF32 01A	Apply regulations when operating a small vessel
		THHBKA04A	Clean and maintain premises
THHCOR03A	Follow health, safety and security procedures		
H	Navigation	TDM MH7 01A	Apply weather information when navigating a vessel
		TDM MH8 01A	Plan and navigate an inshore passage
		SFISHIP 202A	Contribute to safe navigation
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
R	Carry Out Operations on Equipment and Systems	TDM MR30 01A	Operate and carry out basic maintenance on small vessel marine propulsion systems
		TDM MR31 01A	Operate and carry out basic maintenance on auxiliary systems
		TDM MR32 01A	Operate and carry out basic routine maintenance on extra low voltage electrical systems, starter motors and alternators
		TDM MR43 01A	Assist in mooring and anchor handling activities
		THHBKA01A	Organise and prepare food
		THHWC02Aa	Prepare sandwiches
		THHADCC02A	Plan, prepare and display a buffet

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 11 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through a marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

It should be noted that training and assessing units TDT MF8 00A 'Comply with emergency procedures', TDT MF9 00A 'Fight and extinguish fires', TDT MF11 00A 'Survive at sea in the event of vessel abandonment', and TDT MF12 00A 'Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire' will usually be covered holistically by Registered Training Organisations during training and assessment of 'elements of shipboard safety'. This combination of units is equivalent to unit SFISHIP 211A 'Take emergency action on board a vessel' in the Seafood Industry Training Package.

In situations where navigational responsibilities at this level of qualification are likely to be limited, it is recommended that the Seafood Industry competency unit SFISHIP202A 'Contribute to safe navigation' is used. Where, navigational responsibilities are likely to be more extensive and where there is a likelihood of career progression to Certificate III and a wider range of navigational responsibilities, then the Maritime Industry competency unit TDT MH8 00A 'Plan and navigate an inshore passage' should be considered.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate III in Transport & Distribution (Maritime Operations)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned AQF Level 3.

"Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the selection of equipment, services or contingency measures and within known time constraints. Applications may involve some responsibility for others. Participation in teams including group or team coordination may be involved."

Qualification Contents:

FIELD	UNIT		
A	Handling Cargo and Vessel Stability	TDM MA11 01A	Maintain the stability of a vessel using simplified stability information
B	Equipment Checking and Maintenance	TDM MB01 01A	Perform routine remedial, preventative and survey maintenance tasks on a vessel
		TDM MB6 01A	Monitor condition and seaworthiness of a small vessel
		TDM MB7 01A	Slip vessel and maintain hull
		TDM MB20 01A	Assist engineer in the routine maintenance of main propulsion and ancillary machinery and systems
C	Manoeuvre Vessel	TDM MC7 01A	Apply seamanship skills and techniques when operating a small vessel
		TDM MC8 01A	Manoeuvre a vessel less than 24 metres in length within inshore limits
		TDM MC9 01A	Manoeuvre a vessel less than 12 metres in length within inshore limits
		TDM MC10 01A	Steer a commercial vessel under the direction of the Officer in Charge of the Watch
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties
		TDM ME5 001	Transmit and receive information by marine radio or telephone *
F	Operational Quality and Safety	TDM MF2 01A	Respond to navigational emergencies
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF18 01A	Apply medical first aid on board a vessel
		TDM MF19 01A	Operate life-saving appliances
		TDM MF23 01A	Operate emergency equipment and apply emergency procedures
		TDM MF32 01A	Apply regulations when operating a small vessel
		TDM MF35 01A	Contribute to maintaining a safe watch
		TDM MF43 01A	Carry out fast rescue craft operations
		BSXFMI409A	Implement and monitor continuous improvement systems and processes
		BSXFMI306A	Manage workplace information
		BSXFMI307A	Manage quality customer service
		THHBKA04A	Clean and maintain premises
		THHCOR03A	Follow health, safety and security procedures

FIELD		UNIT	
H	Navigation	TDM MH5 01A	Use radar to maintain safety of navigation
		TDM MH7 01A	Apply weather information when navigating a vessel
		TDM MH8 01A	Plan and navigate an inshore passage
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
		TDM ML3 01A	Establish and maintain a harmonious workplace environment
R	Carry Out Operations on Equipment and Systems	TDM MR1 01A	Operate and maintain steering gear arrangements
		TDM MR2 01A	Use and maintain deck machinery installed on a vessel
		TDM MR3 01A	Operate fuel, fresh and ballast water, bilge and fire pumping systems installed in a vessel
		TDM MR30 01A	Operate and carry out basic service checks on small vessel marine propulsion systems
		TDM MR31 01A	Operate and carry out basic servicing on auxiliary systems
		TDM MR32 01A	Operate and carry out basic routine servicing of marine extra low and low voltage electrical systems
		TDM MR33 01A	Perform routine rigging and lifting operations on board a vessel
		TDM MR34 01A	Operate deck machinery
		TDM MR43 01A	Assist in mooring and anchor handling activities
		TDM MR44 01A	Assist in completion of operations and maintenance documentation
		TDM MR45 01A	Provide support in completing cargo and bunkering operations
		TDM MR46 01A	Assist in basic welding, cutting and machining operations on a vessel
		TDM MR47 01A	Use and care for hand and power tools carried on a vessel
		TDM MR50 01A	Carry out basic food handling, preparation, stock control and storage on an off-shore support vessel or rig
		TDM MR51 01A	Carry out windlass operations on a rig
		TDM MR52 01A	Carry out dogging and cargo handling operations at a rig
		TDM MR53 01A	Carry out anchor handling, towage and supply duties at a rig
		THHBKA01A	Organise and prepare food
		THHWC02aA	Prepare sandwiches
		THHADCC02A	Plan, prepare and display a buffet
U	Environment	TDM MU4 01A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 17 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA and/or a marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate IV in Transport & Distribution (Maritime Operations)

Meeting the occupational requirements of a Master (Class 4)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 4.

"Performance of a broad range of skilled applications including requirements to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others."

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDM MA9 01A	Prepare a cargo plan for cargo loading and unloading operations
		TDM MA12 01A	Manage stress and dynamic factors affecting vessel's stability
B	Equipment Checking and Maintenance	TDM MB6 01A	Monitor condition and seaworthiness of a small vessel
C	Manoeuvre Vessel	TDM MC5 01A	Manoeuvre a vessel less than 80 metres in length in any prevailing conditions
		TDM MC6 01A	Manage a propulsion unit using the appropriate engine systems and support services
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
		TDM ME5 01A	Transmit and receive information by marine radio or telephone
		TDM ME8 01A	Transmit and receive information by GMDSS sub-systems and equipment
F	Operational Quality and Safety	TDM MF2 01A	Respond to navigational emergencies
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF13 01A	Manage marine fire fighting and prevention activities
		TDM MF18 01A	Apply medical first aid on board a vessel
		TDM MF20 01A	Prevent, control and fight fires on board a vessel
		TDM MF32 01A	Apply regulations when operating a small vessel
		TDM MF33 01A	Execute watchkeeping arrangements and procedures
		BSXFM1409A	Implement and monitor continuous improvement systems and processes
BSXFM1409A	Manage workplace information		
H	Navigation	TDM MH2 01A	Determine position of the vessel and the accuracy of the resultant position
		TDM MH6 01A	Plan and conduct a coastal passage and determine position
		TDM MH5 01A	Use radar to maintain safety of navigation
		TDM MH7 01A	Apply weather information when navigating a small vessel
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
		TDM ML3 01A	Establish and maintain a harmonious workplace environment

FIELD		UNIT	
N	Assessment	BSZ402A	Conduct assessment
U	Environment	TDM MU4 01A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 20 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through a marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

CHARACTERISTICS OF THE QUALIFICATION

Title:
Diploma of Transport & Distribution (Maritime Operations)

Rationale:
A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 5.

"The self-directed application of knowledge and skills, with substantial depth in some areas where judgement is required in planning and selecting appropriate equipment, services and techniques for self and others. Applications involve participation in development of strategic initiatives, as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team coordination and management may be involved.

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDM MA7 01A	Monitor the loading, stowage, securing and unloading of cargoes
		TDM MA8 01A	Monitor the care of cargoes during the voyage
B	Equipment Checking and Maintenance	TDM MB4 01A	Maintain seaworthiness of vessel
		TDM MB5 01A	Manage the maintenance of the vessel
C	Manoeuvre Vessel	TDM MC3 01A	Manoeuvre the vessel in normal conditions
		TDM MC4 01A	Manoeuvre the vessel and operate small power plants
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
		TDM ME2 01A	Communicate using standard marine navigational vocabulary
		TDM ME3 01A	Transmit and receive information by visual signalling
		TDM ME5 01A	Transmit and receive information by marine radio or telephone
		TDM ME8 01A	Transmit and receive information by GMDSS sub-systems and equipment
F	Operational Quality and Safety	TDM MF2 01A	Respond to navigational emergencies
		TDM MF3 01A	Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF 13 01A	Manage marine fire-fighting and prevention activities
		TDM MF 14 01A	Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers
		TDM MF 15 01A	Plan and implement special safety, maintenance and emergency procedures for chemical tankers
		TDM MF 16 01A	Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDM MF17 01A	Respond to distress signal at sea
		TDM MF18 01A	Apply medical first aid on board a vessel
		TDM MF19 01A	Operate lifesaving appliances
TDM MF20 01A	Prevent, control and fight fires on board a vessel		
TDM MF21 01A	Control safe access to and on vessel		
TDM MF29 01A	Maintain a safe navigational watch on a coastal voyage		
TDM MF30 01A	Maintain a safe navigational watch		

FIELD		UNIT	
F	Operational Quality and Safety cont.	TDM MF 43 01A	Carry out fast rescue craft operations
		BSXFMI505A	Manage operations to achieve planned outcomes
		BSXFMI509A	Implement and monitor continuous improvement systems and processes
H	Navigation	TDM MH4 01A	Plan and conduct a passage and determine position
		TDM MH5 01A	Use radar to maintain safety of navigation
		TDM MH6 01A	Plan and conduct a coastal passage and determine position
L	Human Resources	TDM ML2 01A	Contribute to effective human relationships on board a vessel*
		BSXFMI504A	Participate in, lead and facilitate work teams
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
U	Environment	TDM MU4 01A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 20 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA and/or a marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Advanced Diploma of Transport & Distribution (Maritime Operations)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 6.

"The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved. Significant judgement is required in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures."

Qualification Contents:

FIELD	UNIT		
A	Handling Cargo and Vessel Stability	TDM MA1 01A	Plan and ensure safe loading, stowage, securing and unloading of cargo
		TDM MA2 01A	Plan and ensure safe care of cargo during the voyage
		TDM MA3 01A	Plan and monitor the carriage of dangerous cargoes
		TDM MA4 01A	Manage procedures for the handling, loading and discharging of liquefied gas cargoes
		TDM MA5 01A	Manage procedures for the handling, loading and discharging of chemical cargoes
		TDM MA6 01A	Manage procedures for the handling, loading and discharging of oil cargoes
		TDM MA7 01A	Monitor the loading, stowage, securing and unloading of cargoes
		TDM MA8 01A	Monitor the care of cargoes during the voyage
		TDM MA10 01A	Control trim, stability and stress
		TDM MA16 01A	Manage loading and embarkation procedures on roll-on roll-off vessels
C	Manoeuvre Vessel	TDM MC1 01A	Manoeuvre and handle a vessel of 500 tonnage or more in <u>all</u> conditions
		TDM MC2 01A	Operate remote controls of propulsion plant and engineering systems and procedures
		TDM MC3 01A	Manoeuvre the vessel in normal conditions
E	Communications	TDM ME1 01A	Understand orders and be understood in relation to shipboard duties*
		TDM ME2 01A	Communicate using standard marine navigational vocabulary
		TDM ME3 01A	Transmit and receive information by visual signalling
		TDM ME5 01A	Transmit and receive information by marine radio or telephone
		TDM ME8 01A	Transmit and receive information by GMDSS sub-systems and equipment
F	Operational Quality and Safety	TDM MF1 01A	Assist in research and rescue operations
		TDM MF2 01A	Respond to navigational emergencies
		TDM MF3 01A	Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDM MF4 01A	Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDM MF5 01A	Develop emergency and damage control plans and handle emergency situations
		TDM MF6 01A	Organise and manage the provision of medical care on board a vessel
		TDM MF7 01A	Observe safe working practices*
		TDM MF8 01A	Comply with emergency procedures*
		TDM MF9 01A	Fight and extinguish fires*
		TDM MF10 01A	Provide first aid*
		TDM MF11 01A	Survive at sea in the event of vessel abandonment*
		TDM MF12 01A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDM MF 13 01A	Manage marine fire-fighting and prevention activities
		TDM MF14 01A	Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers

FIELD	UNIT		
F	Operational Quality and Safety (continued)	TDM MF16 01A	Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDM MF17 01A	Respond to distress signal at sea
		TDM MF18 01A	Apply medical first aid on board a vessel
		TDM MF19 01A	Operate lifesaving appliances
		TDT MF20 01A	Prevent, control and fight fires on board a vessel
		TDM MF26 01A	Establish watchkeeping arrangements and procedures
		TDM MF30 01A	Maintain a safe navigational watch
		TDM MF37 01A	Manage vessel operations
		TDM MF43 01A	Carry out fast rescue craft operations
		TDM MF44 01A	Apply safety regulations on roll-on roll-off vessels
H	Navigation	TDM MH1 01A	Plan a voyage and conduct navigation
		TDM MH2 01A	Determine position of the vessel and the accuracy of the resultant position
		TDM MH3 01A	Manage safe navigation through the use of radar and other navigational aids
		TDM MH9 01A	Forecast weather and oceanographic conditions
		TDM MH10 01A	Navigate a high speed vessel
L	Human Resources	TDM ML1 01A	Organise and manage the crew
		TDM ML2 01A	Contribute to effective human relationships on board a vessel*
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
U	Environment	TDM MU1 01A	Monitor compliance with legislative requirements and measures to ensure protection of the marine environment
		TDM MU4 01A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 34 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

COMPETENCY STANDARDS

- Are the criteria to be used for any assessment leading to national recognised qualifications
- Are required to provide sufficient detail for a proper assessment of competency
- Must reflect workplace competency needs, they are not a course of training
- Are made of building blocks called units. A collection of units of competency (Competency Standards) needs to cover the full range of work activities within an industry. Sometimes units of competency from other industry sectors may be used to reduce duplication. Assessments will group together relevant units of competency
- Are to be used for assessment of new or existing employees and may assist employees to assess their own skills and knowledge and identify where training is needed
- Need to be able to be used flexibly by enterprises to reflect the different job roles and functions of individuals as well as the different business activities of the enterprise
- Competency Standards are intended to describe industry's perspective of work requirements for the industry sector or across industry.
- Standards describe:
 - The kinds of skills, knowledge and attributes needed to be applied in work activities
 - The indicators that describe when someone performs these activities well
 - What employers and workers describe as required work competence
 - The criteria used for assessment of competency
- Standards are not curriculum documents or training programs. Standards provide a basis for assessment including the recognition of current competency within the National Training Framework.

STRUCTURE AND LAYOUT OF STANDARDS

Each unit of competency consists of:

- Elements
- Performance criteria
- Range of variables
- Evidence guide

Performance Criteria, Range of Variables and Evidence Guides together identify what must be assessed for a unit of competency within the framework provided by the elements statements. Units of Competency may be assessed (and learned) in an integrated fashion with other units of competency.

UNITS OF COMPETENCY

Describe a broad area of performance.

Units of competency must:

- Be transferable and integrate a number of skills
- Define a major skills area of industry
- Relate to realistic work place activities
- Allow contextualisation to particular workplaces, products, work systems and circumstances whilst maintaining transferability

Successful achievement of units of competency would normally require the use of several skills and the application of knowledge, attitudes and values in the workplace.

Contextualisation and customisation must maintain the integrity of the units of competency.

ELEMENTS OF COMPETENCY

Identify and describe actions of outcomes (performances) which are observable. They are the smallest logical, identifiable, discrete sub-groupings of actions and knowledge that make up a unit of competency.

They are the component activities of the unit.

An element defines the skills associated with the unit. Elements provide further information on the scope of the unit of competency.

PERFORMANCE CRITERIA

Outline what people do to display competency.

Performance criteria are as precise as possible.

They:

- Describe evidence that is observable
- Describe only essential aspects of performance
- Refer to the work requirements where practicable
- Describe aspects of work organisations and the overall work role
- Avoid specifying procedures or methods

RANGE OF VARIABLES

Specify the range of contexts and conditions in which the competency is valid. Information must include:

- Legislation, regulations, codes and conventions such as OHS and pollution control regulations, USL Code, AMSA Marine Orders, IMO Conventions and Codes, etc.
- The range of equipment, processes and procedures
- Particular locations and situations
- Requirements arising from enterprise procedures and industrial arrangements

EVIDENCE GUIDES

Cover the required evidence of competency including the critical aspects of a unit that include underpinning knowledge and the relationship of the unit to other units of competency.

The Evidence Guides provide information for assessors and candidates, supplementing information given in the Performance Criteria.

KEY COMPETENCIES

There are also competencies that underlie all work, the Key Competencies. Key competencies are integrated within the units of competency and are allocated to three performance levels.

Key Competencies are seen to have the capacity to assist in the transfer of knowledge and skill to new situations eg. different equipment or software, new processes.

1. *Collecting, analysing and organising information*

The capacity to locate information, sift and sort information in order to select what is required and present it in a useful way, and evaluate both the information itself and the sources and methods to obtain it.

2. *Communicating ideas and information*

The capacity to communicate effectively with others using a range of spoken, written, graphic and other non-verbal means of expression.

3. *Planning and organising activities*

The capacity to plan and organise one's own work activities, including making good use of time and resources, sorting out priorities and monitoring one's own performance.

4. Working with others in teams

The capacity to interact effectively with other people both on a one-to-one basis and in groups, including understanding and responding to the needs of a client and working effectively as a member of a team to achieve a shared goal.

5. Using mathematical ideas and techniques

The capacity to use concepts such as number, space and measurement and techniques such as estimation for practical purposes.

6. Solving problems

The capacity to apply problem solving strategies in purposeful ways, both in situations where the problem and the desired solution are clearly evident and in situations requiring critical thinking and a creative approach to achieve an outcome.

7. Using technology

The capacity to apply technology, combining the physical and sensory skills needed to operate equipment with the understanding of scientific and technological principles needed to explore and adapt systems. (Mayer, 1992)

KEY COMPETENCIES	PERFORMANCE LEVEL 1	PERFORMANCE LEVEL 2	PERFORMANCE LEVEL 3
1. Collecting, analysing and organising ideas and information	Access and record - single source	Access, select and record - more than one source	Access, evaluate and organise - range of sources
2. Communicating ideas and information	Simple - familiar setting	Complex - particular context	Complex - variety of contexts
3. Planning and organising activities	Under supervision	With guidance	Independently initiate and evaluate complex activity
4. Working with others and in teams	Familiar activities	Help formulate and achieve goals	Collaborate in complex activities
5. Using mathematical ideas and techniques	Simple tasks	Select appropriate complex tasks	Evaluate and adapt as appropriate for task
6. Solving problems	Routine - minimal supervision Exploratory - close supervision	Routine – independently Exploratory - with guidance	Complex problems Implement systematic approach; explain processes
7. Using technology	Reproduce or present basic product or service	Construct organise or operate products or services	Design or tailor products or services

TDM MA1 01A PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to plan and oversee the safe and efficient loading, stowage, security and unloading of cargo.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2

ELEMENT	PERFORMANCE CRITERIA
1. Plan the loading, stowage, security and unloading of cargo	<ul style="list-style-type: none"> a. The cargo to be loaded or unloaded is identified and its characteristics and dimensions established b. Required communications between the vessel and the shore terminal are conducted prior to the vessel's arrival concerning loading / unloading arrangements c. The longitudinal stresses acting on vessel's hull for the intended cargo configuration are calculated d. The trim and stability of the vessel during loading / unloading operations and when loaded are calculated including the use of a GZ curve e. The vessel's stowage plan is prepared and interpreted in accordance with company procedures
2. Load, stow and unload general cargo	<ul style="list-style-type: none"> a. Preparations for loading, stowage and unloading are carried out in accordance with procedures and stowage plan b. Relevant regulations, procedures and instructions pertaining to the type of cargo to be handled are accessed and interpreted prior to commencing operations c. Techniques used for cargo calculations and handling are selected and correctly applied according to the type of cargo to be loaded, stowed or unloaded d. Cargo is correctly identified, inspected and confirmed against documentation prior to commencement of loading, unloading and stowage operations e. Loading, stowage and unloading operations are carried out in accordance with procedures and stowage plan for the type of cargo involved f. Communication is clear, concise and acknowledged at all times according to good cargo handling practice and regulations
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. Tests and inspections on cargo handling equipment are conducted in accordance with regulations and company procedures b. Cargo handling hazards are identified and action is taken to minimise or eliminate risk to personnel, cargo, vessel and the environment c. Safety and hazard minimisation procedures and regulations are followed at all times during cargo handling operations d. Where relevant, precautions and procedures necessary for gas-freeing a tank and for the entry of personnel into a tank are correctly followed e. Where relevant, procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are correctly followed f. Action is taken in the event of a cargo handling incident or emergency to secure the cargo and the vessel and maintain the safety of the vessel and persons involved
4. Perform ballast management	<ul style="list-style-type: none"> a. Ballast requirements of port authority are identified and interpreted b. Ballast management procedures are carried out in accordance with company procedures and port authority requirements c. Ballast management problems are identified and necessary action taken to minimise risk to the environment

5. **Complete cargo handling documentation**

- a. Independent cargo surveyors are used in the loading stowage and unloading of cargo in accordance with company procedures
- b. Correct log book entries are made relating to cargo handling operations and incidents
- c. A letter of protest is used in any untoward incident relating to cargo operations and care
- d. All cargo handling documentation is completed in accordance with requirements and regulations

Range Of Variables

PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the planning and execution of a significant range of cargo handling techniques across a wide and often unpredictable variety of cargo types and operational contexts. Contribution to the development of a broad plan or strategy for cargo handling operations and stowage is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to cargo handling operations and procedures.
2. Worksite environment	<ul style="list-style-type: none"> a. Cargo may be loaded or unloaded from any Australian or international commercial vessel b. Cargo handling operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. at various shoreside loading and discharge terminals c. Types of cargo may include: <ul style="list-style-type: none"> c.1. general cargo c.2. containers c.3. various types of solid bulk materials c.4. various types of bulk liquids c.5. special and abnormal cargo such as: <ul style="list-style-type: none"> c.5.1. refrigerated cargo and containers c.5.2. pig iron, ingots and steel billets c.5.3. mineral concentrates c.5.4. extra heavy cargo d. Cargo handling equipment may include: <ul style="list-style-type: none"> d.1. single swinging derricks d.2. union purchase derricks d.3. ship-board cranes d.4. terminal based cranes d.5. pumps, valves and hoses e. Cargo handling hazards may include: <ul style="list-style-type: none"> e.1. faulty cargo handling equipment e.2. damaged cargo e.3. cargo handling operations in poor weather or sea conditions e.4. incorrectly stowed cargo e.5. incorrectly lashed or secured cargo e.6. using equipment beyond safe working limits e.7. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. cargo handling operational orders and instructions a.3. relevant sections of IMO STCW Convention and Code a.4. relevant sections of AMSA Marine Orders a.5. vessel's log a.6. vessel's 'Cargo Securing Manual' a.7. vessel's Register of Materials Handling Equipment a.8. vessel / shore safety checklist a.9. company cargo handling procedures a.10. cargo handling equipment manufacturer's instructions and recommended procedures a.11. instructions of relevant Maritime Authorities a.12. relevant Australian and international standards and regulatory requirements

Range Of Variables (continued)

PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. sections of IMO STCW Code and Convention related to cargo handling a.2. relevant sections of AMSA Marine Orders including a.2.1. Part 32 as it relates to cargo gear a.2.2. Part 34 as it relates to solid bulk cargoes a.2.3. Part 43 as it relates to livestock a.3. International Grain Code a.4. Lumber Loadline requirements and the Code of Safe Practice for Ships carrying Timber Deck Cargo a.5. IMO SOLAS Convention a.6. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and oversee cargo handling operations <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. across a representative range of typical cargo handling contexts a.2. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the handling of cargo during loading / unloading and stowage operations a.3. Identify typical cargo handling problems and hazards and take appropriate action a.4. Communicate effectively with others during cargo handling operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory cargo handling/vessel stability units that form part of a job role of the master of a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Convention and Codes and AMSA Marine Orders applicable to the management of cargo handling operations b. Relevant OH&S and cargo handling legislation, codes of practice, policies and procedures c. ISM Code Safety Management Procedures as they relate to cargo handling operations d. IMO SOLAS Convention e. Methods for handling and securing various types of cargo, including the operation of various types and configurations of lifting gear f. Regulations pertaining to cargo handling equipment and gear g. Typical cargo handling hazards and problems and appropriate preventative and remedial action and solutions h. Procedures for calculating the stresses on lifting gear used in cargo handling operations i. Procedures for determining the forces acting on equipment used to lash cargo j. Typical operational characteristics of different types of ship-board and terminal-based cargo handling equipment and facilities k. Ways of restricting vessel's stress levels within permitted limits during loading / discharging of dry bulk cargoes l. Effects of different types of cargo operations on vessel's trim and stability m. Procedures for calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal loadline zones n. Effects on cargo handling of wind and weather o. Ballast management issues and procedures p. Typical types and sizes of shipping containers q. Standard stowage position numbering systems used on container vessels r. Procedures for determining a vessel's displacement by draught survey s. Factors that affect the reading of a vessel's draught t. Procedures for calculating the longitudinal stresses acting on a vessel's hull using both manual and computer techniques u. Operational procedures and layouts of various types of shoreside terminals used to load and unload vessels v. Cargo handling communication techniques, including terminology used in cargo operations w. Cargo handling documentation requirements, including documentation to limit claims on cargo carried
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan and manage the actual cargo loading / unloading operations of a vessel; and/or b. plan and manage suitably-simulated cargo loading / unloading operations over an appropriate range of cargo handling situations, weather and operational conditions

Evidence Guide (continued)

PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 planning and overseeing cargo handling operations a.2 identifying and evaluating cargo handling problems and determining an appropriate courses of action a.3 identifying and implementing improvements to cargo handling procedures a.4 applying safety precautions relevant to cargo handling operations a.5 assessing operational capability of cargo handling equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 issue resolution procedures b.5 job procedures and work instructions b.6 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.7 quality procedures (where existing) b.8 security procedures b.9 following on-board housekeeping processes b.10 waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MA2 01A PLAN AND ENSURE SAFE CARE OF CARGO DURING A VOYAGE

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to plan and oversee the safe care of cargo during a voyage.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
1. Plan the care of cargo during a voyage	<ul style="list-style-type: none"> a. The cargo being carried is identified and its characteristics established prior to the voyage b. Relevant regulations, procedures and instructions pertaining to the type of cargo being carried are accessed and interpreted prior to voyage c. The vessel's cargo stowage plan is interpreted in accordance with company procedures d. The vessel's plan for the care of cargo during the voyage is prepared in accordance with company and customer requirements and relevant regulations
2. Oversee the care of cargo during a voyage	<ul style="list-style-type: none"> a. Cargo is correctly identified, inspected and status confirmed as required during the voyage b. Action required to maintain the well-being of cargo during the voyage is taken in accordance with company procedures and customer requirements c. Cargo sweat is controlled using shipboard ventilation and humidity control systems as required d. Where relevant, required monitoring and care of livestock is carried out as required by company and customer requirements and relevant regulations e. Communication with relevant personnel is clear, concise and acknowledged at all times according to good cargo care practice and regulations
3. Follow safety and hazard control procedures for cargo during a voyage	<ul style="list-style-type: none"> a. Cargo stowage hazards are identified and action is taken to minimise or eliminate risk to personnel, cargo, vessel and the environment b. Safety and hazard minimisation procedures and regulations related to cargo care are followed at all times during a voyage to maintain the safety of personnel, cargo and vessel c. Where relevant, precautions and procedures necessary for gas-freeing a tank and for the entry of personnel into a tank are correctly followed d. Where relevant, procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are correctly followed e. Action is taken in the event of a cargo related incident or emergency to secure the cargo and the vessel and maintain the safety of the vessel and persons involved
4. Complete cargo care documentation	<ul style="list-style-type: none"> a. Correct log book entries are made relating to cargo care operations and incidents during a voyage b. A letter of protest is used in any untoward incident relating to cargo operations and care c. All cargo reports and documentation are completed in accordance with requirements and regulations

Range Of Variables

PLAN AND ENSURE SAFE CARE OF CARGO DURING A VOYAGE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the planning and execution of a significant range of cargo care techniques across a wide and often unpredictable variety of cargo types and operational contexts. Contribution to the development of a broad plan or strategy for cargo stowage and care is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to cargo care operations and procedures.
2. Worksite environment	<ul style="list-style-type: none"> a. Cargo may be as carried on any Australian or international commercial vessel b. Cargo care operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather c. Types of cargo may include: <ul style="list-style-type: none"> c.1. general cargo c.2. containers c.3. various types of solid bulk materials c.4. various types of bulk liquids c.5. various types of liquefied gas c.6. special and abnormal cargo such as: <ul style="list-style-type: none"> c.6.1. refrigerated cargo and containers c.6.2. pig iron, ingots and steel billets c.6.3. livestock c.6.4. mineral concentrates c.6.5. extra heavy cargo d. Cargo care hazards may include: <ul style="list-style-type: none"> d.1. damaged cargo d.2. cargo security in poor weather or sea conditions d.3. incorrectly stowed cargo d.4. incorrectly lashed or secured cargo d.5. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. cargo care operational orders and instructions a.3. relevant sections of IMO STCW Convention and Code a.4. relevant sections of AMSA Marine Orders a.5. vessel's log a.6. vessel's 'Cargo Securing Manual' a.7. vessel's Register of Materials Handling Equipment a.8. vessel / shore safety checklist a.9. company cargo care procedures a.10. cargo care equipment manufacturer's instructions and recommended procedures a.11. instructions of relevant Maritime Authorities a.12. relevant Australian and international standards and regulatory requirements
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders including <ul style="list-style-type: none"> a.2.1. Part 34 as it relates to solid bulk cargoes a.2.2. Part 43 as it relates to livestock a.3. relevant international, Australian and State/Territory OH&S legislation a.4. International Grain Code a.5. Lumber Loadline requirements and the Code of Safe Practice for Ships carrying Timber Deck Cargo

Evidence Guide

PLAN AND ENSURE SAFE CARE OF CARGO DURING A VOYAGE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and oversee cargo care operations: <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. across a representative range of typical cargo carriage contexts a.2. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the care of cargo during a voyage a.3. Identify typical cargo care problems and hazards and take appropriate action a.4. Communicate effectively with others during cargo care operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Convention and Codes and AMSA Marine Orders applicable to the management of cargo care operations b. Relevant OH&S legislation, codes of practice, policies and procedures c. ISM Code Safety Management System d. Methods for caring for various types of cargo during a voyage e. Typical operational characteristics of different types of ship-board cargo care equipment and facilities f. Typical hazards and problems associated with the carriage of various types of cargo and appropriate preventative and remedial action and solutions g. Differences between vessel's sweat and cargo sweat and reasons for the formation of both h. Processes for the control of vessel and cargo sweat during a voyage including the use of shipboard ventilation and humidity control systems i. Effects of different types of cargo on vessel's trim and stability j. Procedures for calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal loadline zones k. Effects on cargo of wind, weather and sea conditions during a voyage l. Typical types and sizes of shipping containers m. Standard stowage position numbering systems used on container vessels n. Procedures for determining the forces acting on equipment used to lash cargo o. Procedures for calculating the longitudinal stresses acting on a vessel's hull using both manual and computer techniques p. Cargo care communication techniques q. Cargo care documentation requirements including documentation to limit claims on cargo carried
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan and manage the actual cargo care operations during the voyage of a vessel; and/or b. plan and manage suitably-simulated cargo care operations over an appropriate range of situations, weather and operational conditions

Evidence Guide (continued)

PLAN AND ENSURE SAFE CARE OF CARGO DURING A VOYAGE

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning and overseeing cargo care operations a.2 identifying and evaluating cargo care problems and determining an appropriate courses of action a.3 identifying and implementing improvements to cargo care procedures a.4 applying safety precautions relevant to cargo care operations a.5 assessing operational capability of cargo care equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 issue resolution procedures b.5 job procedures and work instructions b.6 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.7 quality procedures (where existing) b.8 security procedures b.9 following on-board housekeeping processes c. Action taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MA3 01A PLAN AND MONITOR THE CARRIAGE OF DANGEROUS CARGOES

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to plan and oversee the safe and efficient loading, stowage, security and unloading of dangerous cargoes.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan the loading, stowage, security and unloading of dangerous cargo</p>	<ul style="list-style-type: none"> a. The dangerous cargo to be loaded or unloaded is identified and its characteristics and dimensions established b. Required communications between the vessel and the shore terminal are conducted prior to the vessel's arrival concerning loading / unloading arrangements c. The longitudinal stresses acting on vessel's hull for the intended dangerous cargo stowage configuration are calculated d. The trim and stability of the vessel during loading / unloading operations and when loaded are calculated including the use of a GZ curve e. The vessel's stowage plan is prepared and interpreted in accordance with company procedures
<p>2. Load, stow and unload dangerous cargo</p>	<ul style="list-style-type: none"> a. Preparations for loading, stowage and unloading are carried out in accordance with procedures and stowage plan b. Relevant regulations, procedures and instructions pertaining to the type of dangerous cargo to be handled are accessed and interpreted prior to commencing operations c. Techniques used for dangerous cargo calculations and handling are selected and correctly applied according to the type of dangerous cargo to be loaded, stowed or unloaded d. Dangerous cargo is correctly identified, inspected and confirmed against documentation prior to commencement of loading, unloading and stowage operations e. Loading, stowage and unloading operations are carried out in accordance with procedures and stowage plan for the type of dangerous cargo involved f. Communication is clear, concise and acknowledged at all times according to good dangerous cargo handling practice and regulations
<p>3. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Tests and inspections on dangerous cargo handling equipment are conducted in accordance with regulations and company procedures b. Dangerous cargo handling hazards are identified and action is taken to minimise or eliminate risk to personnel, dangerous cargo, vessel and the environment c. Safety and hazard minimisation procedures and regulations are followed at all times during dangerous cargo handling operations d. Where relevant, precautions and procedures necessary for gas-freeing a tank and for the entry of personnel into a tank are correctly followed e. Where relevant, procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are correctly followed f. Action is taken in the event of a dangerous cargo handling incident or emergency to secure the dangerous cargo and the vessel and maintain the safety of the vessel and persons involved
<p>4. Perform ballast management</p>	<ul style="list-style-type: none"> a. Ballast requirements of port authority are identified and interpreted b. Ballast management procedures are carried out in accordance with company procedures and port authority requirements c. Ballast management problems are identified and necessary action taken to minimise risk to the environment

5. **Complete dangerous cargo handling documentation**
 - a. Independent cargo surveyors are used in the loading stowage and unloading of dangerous cargo in accordance with company procedures
 - b. Correct log book entries are made relating to dangerous cargo handling operations and incidents
 - c. A letter of protest is used in any untoward incident relating to cargo operations and care
 - d. All cargo handling documentation is completed in accordance with requirements and regulations

Range Of Variables

PLAN AND ENSURE SAFE LOADING,STOWAGE, SECURITY AND UNLOADING OF DANGEROUS CARGOES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the planning and execution of a significant range of dangerous cargo handling techniques across a wide and often unpredictable variety of dangerous cargo types and operational contexts. Contribution to the development of a broad plan or strategy for dangerous cargo handling operations and stowage is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to dangerous cargo handling operations and procedures.
2. Worksite environment	<ul style="list-style-type: none"> a. Dangerous cargo may be loaded or unloaded from any Australian or international commercial vessel b. Dangerous cargo handling operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. at various shoreside loading and discharge terminals c. Dangerous cargo may include the various classes of dangerous goods as detailed in the International Maritime Dangerous Goods (IMDG) Code including: <ul style="list-style-type: none"> c.1. oil and petroleum products c.2. corrosive and toxic chemicals c.3. liquefied gas c.4. toxic gas c.5. toxic solid bulk cargo c.6. explosives c.7. munitions c.8. radioactive cargo d. Cargo handling equipment may include: <ul style="list-style-type: none"> d.1. single swinging derricks d.2. union purchase derricks d.3. ship-board cranes d.4. terminal based cranes d.5. pumps, valves and hoses e. Dangerous cargo handling hazards may include: <ul style="list-style-type: none"> e.1. faulty cargo handling equipment e.2. damaged cargo e.3. cargo handling operations in poor weather or sea conditions e.4. incorrectly stowed dangerous cargo e.5. incorrectly lashed or secured dangerous cargo e.6. using equipment beyond safe working limits e.7. explosion e.8. fire e.9. spill of corrosive liquid e.10. spill or release of toxic liquid, gas or material e.11. radiation e.12. non-compliance with safe working procedures

Range Of Variables (continued)

PLAN AND ENSURE SAFE LOADING,STOWAGE, SECURITY AND UNLOADING OF DANGEROUS CARGOES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. dangerous cargo handling operational orders and instructions a.3. relevant sections of IMO STCW Convention and Code a.4. relevant sections of AMSA Marine Orders a.5. IMO SOLAS Convention a.6. vessel's log a.7. IMDG Code a.8. vessel's 'Cargo Securing Manual' a.9. vessel's Register of Materials Handling Equipment a.10. vessel / shore safety checklist a.11. company dangerous cargo handling procedures a.12. cargo handling equipment manufacturer's instructions and recommended procedures a.13. instructions of relevant Maritime Authorities a.14. relevant Australian and international standards and regulatory requirements
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of IMO STCW Code and Convention related to dangerous cargo handling a.2. relevant sections of AMSA Marine Orders including <ul style="list-style-type: none"> a.2.1. Part 32 as it relates to cargo gear a.2.2. Part 41 as it relates to dangerous cargoes a.3. relevant international, Australian and State/Territory OH&S legislation a.4. IMO SOLAS Convention a.5. ISM Code

Evidence Guide

PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF DANGEROUS CARGOES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none">a.1. Plan and oversee dangerous cargo handling operations<ul style="list-style-type: none">a.1.1. safely in both normal and emergency situationsa.1.2. in normal and adverse weather conditionsa.1.3. across a representative range of typical dangerous cargo handling contextsa.2. Exercise all required safety, environmental and hazard control precautions and procedures when overseeing the handling of dangerous cargo during loading / unloading and stowage operationsa.3. Identify typical dangerous cargo handling problems and hazards and take appropriate actiona.4. Communicate effectively with others during dangerous cargo handling operationsa.5. Complete all required dangerous cargo documentation requirements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none">a. Knowledge of IMO STCW 95 Convention and Code and AMSA Marine Orders applicable to the management of dangerous cargo handling operationsb. Relevant OH&S and dangerous cargo handling legislation, codes of practice, policies and proceduresc. ISM Code Safety Management Systemd. IMDG Codee. Dangerous goods identification codes and signage requirementsf. Methods for handling various types of dangerous cargog. Characteristics, hazards and problems of different types of dangerous cargo and associated preventative and remedial action and solutionsh. Typical operational characteristics of different types of ship-board and terminal-based cargo handling equipment and facilitiesi. Effects on dangerous cargo handling of wind, weather and sea conditionsj. Procedures for determining the forces acting on equipment used to lash dangerous cargok. Dangerous cargo handling communication techniquesl. Ballast management issues and proceduresm. Procedures for determining a vessel's displacement by draught surveyn. Factors that affect the reading of a vessel's draughto. Procedures for calculating the longitudinal stresses acting on a vessel's hull using both manual and computer techniquesp. Effects of different types of cargo operations on vessel's trim and stabilityq. Procedures for calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal loadline zonesr. Procedures for calculating the stresses on lifting gear used in cargo handling operationss. Dangerous cargo handling documentation including documentation to limit claims on cargo carried

Evidence Guide (continued)

PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF DANGEROUS CARGOES

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan and manage the actual dangerous cargo loading / unloading operations of a vessel; and/or b. plan and manage suitably-simulated dangerous cargo loading / unloading operations over an appropriate range of dangerous cargo handling situations, weather and operational conditions
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning and overseeing dangerous cargo handling operations a.2 identifying and evaluating dangerous cargo handling problems and determining an appropriate courses of action a.3 identifying and implementing improvements to dangerous cargo handling procedures a.4 applying safety precautions relevant to dangerous cargo handling operations a.5 assessing operational capability of cargo handling equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 issue resolution procedures b.5 job procedures and work instructions b.6 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.7 quality procedures (where existing) b.8 security procedures b.9 following on-board housekeeping processes b.10 waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3

TDM MA4 01A **MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF LIQUEFIED GAS CARGOES**

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to safely manage procedures for the handling, loading and discharging of liquefied gas cargoes on liquefied gas tankers, including use of checklists, cargo condition maintenance both on passage and in harbour, segregation of cargoes, transfer of liquefied gas cargoes, cleaning of tanks, changing of cargoes, sampling of liquefied gas cargoes, ballasting and deballasting, and following warming up and gas-freeing procedures, as well as the cooling down of a gas-free system from ambient temperature.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and AMSA Marine Orders – Part 3, Issue 5, 2Appendix 5

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan the loading, discharge and condition maintenance of liquefied gas cargo</p>	<p>a. Plans for the loading, discharge and condition maintenance of liquefied gas cargoes are obtained or prepared in accordance with company procedures, tanker's ISM Code Safety Management System, regulatory requirements and established maritime practice</p> <p>b. Checklists for use in the loading, discharge and condition maintenance of liquefied gas cargoes are obtained or developed</p> <p>c. Operational plans and procedures for the loading, discharge and condition maintenance of liquefied gas cargoes are documented and made available to relevant staff in accordance with tanker procedures and regulatory requirements</p>
<p>2. Manage the loading, discharge and condition maintenance of liquefied gas cargo</p>	<p>a. Operational plans and procedures for the loading, discharge and condition maintenance of liquefied gas cargoes are implemented in accordance with operational and regulatory requirements</p> <p>b. Personnel involved in liquefied gas operations are correctly supervised in accordance with company and regulatory requirements</p> <p>c. Cargo segregation and cargo transfer procedures are correctly carried out in accordance with operational and regulatory requirements</p> <p>d. Checklists are correctly used in accordance with tanker procedures</p> <p>e. The condition of liquefied gas cargo is correctly maintained in accordance with established procedures and liquefied gas tanker practice</p> <p>f. Liquefied gas cargo sampling and testing is carried out in accordance with established tanker procedures and regulatory requirements</p> <p>g. Established procedures and precautions are applied during tank cleaning operations</p> <p>h. The cool-down of a gas-free system from ambient temperature are closely followed in accordance with established operational procedures and safety precautions</p> <p>i. Warm-up and gas freeing procedures are implemented in accordance with established liquefied tanker practice and regulatory requirements</p> <p>j. Ballasting and de-ballasting procedures for a liquefied gas tanker are followed in accordance with operational requirements and regulatory requirements</p> <p>k. Required communication with relevant personnel is correctly and constantly maintained throughout loading, discharging, handling and condition maintenance operations involving liquefied gas cargo</p>

<p>3. Ensure the implementation of safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Appropriate personal protection clothing and equipment is correctly used throughout loading, discharge, handling and condition maintenance operations involving liquefied gas cargo b. Hazard minimisation and safety precautions for the loading, discharging and handling of liquefied gas products are carried out in accordance with regulatory requirements and established liquefied gas tanker practice c. Appropriate monitoring equipment is correctly used throughout loading, discharge, handling and condition maintenance operations d. Emergency situations during loading or discharging of cargo or cargo condition monitoring and maintenance are identified and acted upon in accordance with established tanker emergency procedures and regulatory requirements
<p>4. Implement pollution prevention measures</p>	<ul style="list-style-type: none"> a. Air and water pollution prevention procedures are implemented in accordance with established tanker practice and regulatory requirements b. Required action is taken in the event of a spillage, vapour release or the jettisoning of cryogenic liquids in accordance with regulatory requirements and established oil tanker procedures c. All relevant information is immediately reported to appropriate officials when a spill, vapour release, or the jettisoning of cryogenic liquids is detected or when a malfunction has occurred which may poses a risk of a spill or release d. Shore-based personnel are immediately notified of a spill, vapour release, or the jettisoning of cryogenic liquids e. Shipboard spill and vapour containment and emergency procedures are initiated in accordance with established tanker practice and regulatory requirements
<p>5. Complete cargo handling documentation</p>	<ul style="list-style-type: none"> a. Correct reports are completed relating to liquefied gas cargo handling operations and incidents in accordance with established procedures and regulatory requirements b. All cargo handling documentation is completed in accordance with requirements and regulations

Range Of Variables

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF LIQUEFIED GAS CARGOES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW 95 Code and Convention, ISM Code and tanker safety guides and port regulations related to liquefied gas cargo operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of operational and supervisory principles and procedures, safety precautions and hazard minimisation strategies to the management of the loading, discharge, handling and condition maintenance of cargo on a liquefied gas tanker. Contribution to the development of a broad plan for liquefied gas cargo handling and maintenance operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the handling and condition maintenance of cargo on a liquefied gas tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international liquefied gas tanker b. Liquefied gas cargo handling operations may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during warm-up and cool-down procedures b.6. during tank cleaning b.7. during liquefied gas cargo condition maintenance b.8. during liquefied gas cargo sampling c. Operational cargo handling cycle of a liquefied gas tanker may include: <ul style="list-style-type: none"> c.1. cool-down of a gas free system from ambient temperature c.2. liquefied gas loading preparation and operations c.3. maintenance operations during a loaded voyage c.4. liquefied gas discharging preparation and operations c.5. warm-up and gas-freeing operations c.6. tank-stripping and cleaning operations c.7. ballasting operations c.8. maintenance operations during a ballast voyage c.9. de-ballasting operations d. Liquefied gas cargo handling systems and equipment may include: <ul style="list-style-type: none"> d.1. pumps and pumping arrangements and vapour-return systems, piping systems and valves d.2. filters and strainers d.3. expansion devices d.4. flame screens d.5. commonly used inert gases d.6. storage, generation and distribution systems d.7. temperature and pressure monitoring systems d.8. cargo vent systems d.9. liquid re-circulation and re-liquefaction systems d.10. cargo gauging, instrumentation systems and alarms d.11. CO₂ and gas detection and monitoring systems d.12. cargo boil-off systems and auxiliary systems. e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks, goggles and breathing apparatus e.2. resuscitation equipment e.3. protective clothing, including headgear, gloves and footwear e.4. escape and rescue equipment f. Hazards associated with liquefied gas cargoes may include: <ul style="list-style-type: none"> f.1. sources of ignition leading to explosion and fire f.2. electrostatic generation leading to discharge f.3. environmental hazards to air and water f.4. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.5. release of toxic fluids, vapours and gases, involving skin contact, ingestion and inhalation f.6. corrosion hazards to personnel, vessel structures and equipment f.7. working in confined spaces

Range Of Variables (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF LIQUEFIED GAS CARGOES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. established tanker and company liquefied gas cargo operations procedures a.1. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to liquefied gas tankers a.4. 'Liquefied Gas Handling Principles on Ships and in Terminals' SIGTTO a.5. 'Tanker Safety Guide (Liquefied Gas)' ICS a.6. 'Ship to Ship Transfer Guide (Liquefied Gases)' ICS/OCIMF a.7. tanker manufacturer's instructions and recommended procedures a.8. OHS and pollution prevention procedures relevant to the handling of liquefied gas cargoes a.9. instructions of relevant Maritime Authorities concerning liquefied gas cargo operations a.10. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include:</p> <ul style="list-style-type: none"> a.1. sections of the IMO STCW 95 Code and Convention related to liquefied gas tankers a.2. relevant sections of AMSA Marine Orders a.3. instructions of relevant Maritime Authorities concerning liquefied gas cargo operations a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF LIQUEFIED GAS CARGOES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage the safe loading, discharge, handling and condition maintenance of cargo on a liquefied gas tanker a.2. Ensure all required safety and hazard control procedures are implemented during loading, discharge, handling and condition maintenance operations a.3. Identify typical problems that may occur during liquefied gas cargo loading, discharge, handling and condition maintenance operations and take appropriate action a.4. Identify emergency situations that may arise during liquefied gas operations and take appropriate action a.5. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to liquefied gas tanker cargo operations a.6. Communicate effectively with others during liquefied gas cargo handling and maintenance operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of the master of a liquefied gas tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for liquefied gas tankers b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. The basic principles and trends in liquefied gas tanker design and the cargo containment and handling systems <ul style="list-style-type: none"> c.1. types and design of liquefied gas tankers and their equipment c.2. cargo containment systems with special reference to rules, surveys, tank construction, materials, coatings, insulation and compatibility. c.3. cargo handling equipment, including pumps and pumping arrangements and vapour return systems, and piping systems and valves c.4. cargo conditioning systems including warm-up and cool-down procedures c.5. tank atmosphere control systems including the use of inert gas and nitrogen c.6. instrumentation of cargo containment and handling systems including that of gauging, sampling and temperature control and pressure monitoring systems d. Procedures and regulatory requirements for loading, discharge, handling and condition monitoring of liquefied gas cargo including: <ul style="list-style-type: none"> d.1. cargo loading and discharging preparations and procedures d.2. checklists d.3. cargo condition maintenance on passage and in harbour d.4. segregation of cargoes d.5. procedures for cargo transfer and changing cargoes d.6. tank cleaning procedures d.7. cargo sampling d.8. ballasting and de-ballasting d.9. warm up and gas-freeing procedures d.10. cooling down of a gas-free system from ambient temperature and the safety precautions involved. d.11. emergency procedures, i.e. pre-planned action in the event of leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty e. Cargo tank vent systems and procedures <ul style="list-style-type: none"> e.1. types of filters, strainers, expansion devices and flame screens used e.2. the storage, generation and distribution systems for the most commonly used inert gas systems e.3. liquid recirculation and re-liquefaction systems e.4. cargo boil-off systems and auxiliary systems e.5. the function and use of gas detection and monitoring systems and CO₂ monitoring systems e.6. the fire-fighting, safety and rescue systems appropriate for liquefied gas tankers f. Liquefied gas cargo handling systems and equipment and the procedures for their use

Evidence Guide (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF LIQUEFIED GAS CARGOES

<p>2. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> g. Principles of liquefied gas cargo containment, including: <ul style="list-style-type: none"> g.1. containment systems g.2. rules g.3. surveys g.4. tank construction g.5. materials g.6. coatings g.7. insulation g.8. compatibility h. The properties and characteristics of liquefied gases and their vapours, including: <ul style="list-style-type: none"> h.1. the definition of gas h.2. simple gas laws h.3. the gas equation h.4. density of gases h.5. diffusion and mixing of gases h.6. compression of gases h.7. liquefaction of gases h.8. refrigeration of gases h.9. critical temperature h.10. the practical significance of flashpoint h.11. upper and lower explosive limits h.12. auto-ignition temperature h.13. compatibility of gases h.14. reactivity h.15. polymerization h.16. inhibitors. i. The properties of single liquids including: <ul style="list-style-type: none"> i.1. densities of liquids and vapours i.2. variation with temperature i.3. vapour pressure and temperature i.4. enthalpy, vaporization and boiling liquids j. The nature and properties of solutions, including: <ul style="list-style-type: none"> j.1. the solubility of gases in liquids j.2. miscibility between liquids j.3. effects of temperature change j.4. densities of solutions and dependence on temperature and concentration j.5. effects of dissolved substances on melting and boiling points j.6. hydrates, their formation and dispersion j.7. hygroscopicity j.8. drying of air and other gases j.9. dewpoint and low-temperature effects. k. Principles of toxicity of liquefied gas, including <ul style="list-style-type: none"> k.1. the modes by which liquefied gases and their vapours may be toxic k.2. the toxic properties of inhibitors and of products of combustion of both materials of construction and of liquefied gases carried k.3. acute and chronic effects of toxicity, k.4. systemic poisons and irritants k.5. the Threshold Limit Value (TLV) k.6. hazards of skin contact, inhalation and ingestion k.7. medical first aid and administering of antidotes. l. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of liquefied gas cargo
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to manage the safe loading, discharge, handling and condition maintenance of cargo on a liquefied gas tanker, and/or b. manage the safe loading, discharge, handling and condition maintenance of cargo on a on board an operational liquefied gas tanker

Evidence Guide (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF LIQUEFIED GAS CARGOES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 managing the safe loading, discharge, handling and condition maintenance of cargo on a liquefied gas tanker</p> <p>a.2 identifying and evaluating liquefied gas cargo handling problems and determining appropriate courses of action</p> <p>a.3 identifying and implementing improvements to liquefied gas cargo handling procedures</p> <p>a.4 applying safety and hazard control precautions relevant to liquefied gas cargo handling operations</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant sections of IMO STCW 95 Code and AMSA Marine Orders</p> <p>b.2 OHS regulations and hazard prevention policies and procedures</p> <p>b.3 ISM Code safety management system procedures and work instructions on the conduct of maintenance on liquefied gas tankers</p> <p>b.4 relevant manufacturer's guidelines relating to the use of liquefied gas cargo handling plant and equipment, including instructions on equipment capability and limitations</p> <p>b.5 following on-board housekeeping processes</p> <p>b.6 pollution management processes</p> <p>c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	3	3	3

TDM MA5 01A **MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES**

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to safely manage procedures for the handling, loading and discharging of chemical cargoes on chemical tankers, including completion of required cargo calculations, development and implementation of chemical loading and discharging plans and procedures, operation of vapour-return systems, use of checklists, chemical cargo maintenance, completion of gas-freeing and tank-cleaning operations, proper use of absorption and wetting agents and detergents, use and maintenance of inert atmospheres, safe control of entry into pump-rooms and confined spaces, correct use of detecting and safety equipment, and proper disposal of waste and washings.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and f the AMSA Marine Orders – Part 3, Issue 5, Appendix 5

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan the loading, discharge and condition maintenance of chemical cargo</p>	<ul style="list-style-type: none"> a. Plans for the loading, discharge and condition maintenance of chemical cargoes are obtained or prepared in accordance with company procedures, tanker's ISM Code Safety Management System, regulatory requirements and established maritime practice b. Checklists for use in the loading, discharge and condition maintenance of chemical cargoes are obtained or developed c. Operational plans and procedures for the loading, discharge and condition monitoring and maintenance of chemical cargoes are documented and made available to relevant staff in accordance with tanker procedures and regulatory requirements
<p>2. Manage the loading, discharge and condition maintenance of chemical cargo</p>	<ul style="list-style-type: none"> a. Operational plans and procedures for the loading, discharge and condition monitoring and maintenance of chemical cargoes are implemented in accordance with operational and regulatory requirements b. Personnel involved in chemical cargo handling and maintenance operations are correctly supervised in accordance with company and regulatory requirements c. Cargo segregation and cargo transfer procedures are correctly carried out in accordance with operational and regulatory requirements d. Checklists are correctly used in accordance with tanker procedures e. The condition of chemical cargo is correctly maintained in accordance with established procedures and chemical tanker practice f. Chemical cargo gauging, sampling and testing is carried out in accordance with established tanker procedures and regulatory requirements g. Established procedures and precautions are applied during tank cleaning and gas-freeing operations h. Cargo temperature control systems and their associated instrumentation and alarms are correctly monitored and maintained i. Chemical cargo venting systems, vapour return system and accommodation ventilation and air-lock systems are correctly used j. Ballasting and de-ballasting procedures for a chemical tanker are followed in accordance with operational requirements and regulatory requirements k. Required communication with relevant personnel is correctly and constantly maintained throughout loading, discharging, handling and condition maintenance operations involving chemical cargo

<p>3. Ensure the implementation of safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Appropriate personal protection clothing and equipment is correctly used throughout loading, discharge, handling and condition maintenance operations involving chemical cargo b. Hazard minimisation and safety precautions for the loading, discharging and handling of chemical products are carried out in accordance with regulatory requirements and established chemical tanker practice c. Appropriate monitoring equipment is correctly used throughout loading, discharge, handling and condition maintenance operations d. Emergency situations during loading or discharging of cargo or cargo condition monitoring and maintenance are identified and acted upon in accordance with established tanker emergency procedures and regulatory requirements
<p>4. Implement pollution prevention measures</p>	<ul style="list-style-type: none"> a. Air and water pollution prevention procedures are implemented in accordance with established tanker practice and regulatory requirements b. Required action is taken in the event of a chemical spillage in accordance with regulatory requirements and established oil tanker procedures c. All relevant information is immediately reported to appropriate officials when a spill is detected or when a malfunction has occurred which may poses a risk of a spill d. Shore-based personnel are immediately notified of a chemical spill e. Shipboard spill containment and emergency procedures are initiated in accordance with established tanker practice and regulatory requirements
<p>5. Complete cargo handling documentation</p>	<ul style="list-style-type: none"> a. Correct reports are completed relating to chemical cargo handling operations and incidents in accordance with established procedures and regulatory requirements b. All cargo handling documentation is completed in accordance with requirements and regulations

Range Of Variables

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW 95 Code and Convention, ISM Code, tanker safety guides and port regulations related to chemical tanker cargo operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of operational and supervisory principles and procedures, safety precautions and hazard minimisation strategies to the management of the loading, discharge, handling and condition maintenance of cargo on a chemical tanker. Contribution to the development of a broad plan for chemical cargo handling and maintenance operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the handling and condition maintenance of cargo on a chemical tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international chemical tanker b. Chemical cargo handling operations may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during chemical cargo condition monitoring and maintenance b.6. during chemical cargo sampling c. Operational cargo handling cycle of a chemical tanker may include: <ul style="list-style-type: none"> c.1. chemical cargo loading preparation and operations c.2. cargo monitoring and maintenance operations during a loaded voyage c.3. chemical cargo discharging preparation and operations c.4. tank-stripping and cleaning operations c.5. ballasting operations c.6. maintenance operations during a ballast voyage c.7. de-ballasting operations d. Chemical cargo handling systems and related equipment may include: <ul style="list-style-type: none"> d.1. chemical cargo pumps and pumping arrangements and venting and vapour return systems, piping systems and valves d.2. tank temperature control systems and alarms d.3. filters and strainers d.4. gas freeing systems d.5. storage, generation and distribution systems d.6. temperature and pressure monitoring systems d.7. cargo vent systems d.8. cargo vapour return systems d.9. tank cleaning systems d.10. liquid re-circulation and re-liquefaction systems d.11. cargo gauging, instrumentation systems and alarms e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks and goggles e.2. protective clothing, including headgear, gloves and footwear e.3. breathing apparatus e.4. resuscitation equipment e.5. escape and rescue equipment f. Hazards associated with chemical cargoes may include: <ul style="list-style-type: none"> f.1. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.2. environmental hazards to air and water f.3. spills or release of toxic fluids, vapours and gases, involving skin contact, inhalation and ingestion f.4. corrosion hazards to personnel, vessel structures and equipment f.5. working in confined spaces

Range Of Variables (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. established tanker and company chemical cargo operations procedures a.1. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to chemical tankers a.4. 'Safety in Chemical Tankers' ICS a.5. 'Tanker Safety Guide (Chemical Tankers) ICS a.6. 'International Safety Guide for Oil Tankers and Terminals' ICS/OCIMF a.7. 'Ship to Shore Safety Checklist' ICS/OCIMF a.8. 'Ship to Ship Transfer Guide (Petroleum) ICS/OCIMF a.9. tanker manufacturer's instructions and recommended procedures a.10. OHS and pollution prevention procedures relevant to the handling of chemical cargoes a.11. instructions of relevant Maritime Authorities concerning chemical cargo operations a.12. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include:</p> <ul style="list-style-type: none"> a.1. sections of the IMO STCW 95 Code and Convention related to chemical tankers a.2. relevant sections of AMSA Marine Orders a.3. instructions of relevant Maritime Authorities concerning chemical cargo operations a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none">a. Assessment must confirm appropriate knowledge and skills to:<ul style="list-style-type: none">a.1. Manage the safe loading, discharge, handling and condition maintenance of cargo on a chemical tankera.2. Ensure all required safety and hazard control procedures are implemented during loading, discharge, handling and condition monitoring and maintenance operationsa.3. Identify typical problems that may occur during chemical cargo loading, discharge, handling and condition maintenance operations and take appropriate actiona.4. Identify emergency situations that may arise during chemical operations and take appropriate actiona.5. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to chemical tanker cargo operationsa.6. Communicate effectively with others during chemical cargo handling and maintenance operations
2. Interdependent assessment of units	<ul style="list-style-type: none">a. This unit of competency must be assessed in conjunction with other units that form part of a job role of the master of a chemical tanker.
3. Required knowledge and skills	<ul style="list-style-type: none">a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for chemical tankersb. Relevant OH&S and pollution control legislation, codes of practice, policies and proceduresc. Procedures and regulatory requirements for loading, discharge, handling and condition monitoring of chemical cargo including:<ul style="list-style-type: none">c.1. typical calculations required when coordinating the handling of chemical cargoc.2. procedures for the preparation of loading and discharge plans for multiple grade tanker cargoes with due regard to cargo segregation and cargo care on passage.c.3. cargo loading and discharging preparations and proceduresc.4. the purpose and use of check lists, including the Vessel/Shore checklistc.5. the importance of correct supervision and the use of monitoring equipment when handling chemical cargoesc.6. cargo condition monitoring and maintenance on passage and in harbourc.7. principles and procedures for the segregation of cargoesc.8. procedures for cargo transfer and changing cargoesc.9. the use and maintenance of inert atmospheres during cargo operationsc.10. procedures for controlling entry into pumprooms and confined spacesc.11. the principle of operation of gas detection and safety equipmentc.12. gas detection and safety equipment requirements for various shipboard scenarios on a chemical tankerc.13. procedures to prevent air and water pollution including disposal of wastes and washingsc.14. the procedure for tank cleaning and gas freeing operations, including the use of absorption, wetting agents and detergentsc.15. cargo gauging, sampling and testingc.16. ballasting and de-ballastingc.17. emergency procedures, i.e. pre-planned action in the event of spillages, leaks, fire, collision, stranding, emergency cargo discharge and personnel casualtyd. Chemical cargo handling systems and equipment and the procedures for their usee. Principles of chemical cargo containment, including:<ul style="list-style-type: none">e.1. containment systemse.2. rulese.3. surveyse.4. tank constructione.5. materialse.6. coatingse.7. temperature controle.8. insulatione.9. compatibility

Evidence Guide (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

<p>3. Required knowledge and skills (continued)</p>	<p>f. The properties and characteristics of chemicals and their vapours, including:</p> <ul style="list-style-type: none"> f.1. the characteristics of chemicals typically carried f.2. toxicity of various chemical cargoes f.3. critical temperatures of typical chemical cargoes f.4. hazards of typical chemical cargoes and measures for hazard control f.5. safety guides applicable for typical chemical cargoes carried <p>g. Principles of toxicity of chemicals, including</p> <ul style="list-style-type: none"> g.1. the modes by which chemicals and their vapours may be toxic g.2. the toxic properties of inhibitors and of products of combustion of both materials of construction and of chemicals carried g.3. acute and chronic effects of toxicity, g.4. systemic poisons and irritants g.5. the Threshold Limit Value (TLV) g.6. hazards of skin contact, inhalation and ingestion g.7. medical first aid and administering of antidotes. <p>h. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of chemical cargo</p>
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to manage the safe loading, discharge, handling and condition maintenance of cargo on a chemical tanker, and/or b. manage the safe loading, discharge, handling and condition maintenance of cargo on a on board an operational chemical tanker
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 managing the safe loading, discharge, handling and condition maintenance of cargo on a chemical tanker a.2 identifying and evaluating chemical cargo handling problems and determining appropriate courses of action a.3 identifying and implementing improvements to chemical cargo handling procedures a.4 applying safety and hazard control precautions relevant to chemical cargo handling operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the conduct of maintenance on liquefied gas tankers b.4 relevant manufacturer's guidelines relating to the use of chemical cargo handling plant and equipment, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes b.6 pollution management processes c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MA6 01A **MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF OIL CARGOES**

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to safely manage procedures for the handling, loading and discharging of oil cargoes on oil tankers, including completion of required cargo calculations, development and implementation of oil cargo loading and discharging plans and procedures (both vessel-to-shore and vessel-to-vessel), completion of crude oil washing and tank-cleaning operations, use and maintenance of inert atmospheres, correct use of gas detecting and safety equipment, following proper ballasting and deballasting procedures, and implementing water pollution prevention measures.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and the AMSA Marine Orders – Part 3, Issue 5, Appendix 5

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan the loading, discharge and condition maintenance of oil cargo</p>	<ul style="list-style-type: none"> a. Plans for the loading, discharge and condition maintenance of oil cargoes are obtained or prepared in accordance with company procedures, tanker's ISM Code Safety Management System, regulatory requirements and established maritime practice b. Checklists for use in the loading, discharge and condition maintenance of oil cargoes are obtained or developed c. Operational plans and procedures for the loading, discharge, vessel-to-vessel transfer, and monitoring and maintenance of oil cargoes are documented and made available to relevant staff in accordance with tanker procedures and regulatory requirements
<p>2. Manage the loading, discharge and condition maintenance of oil cargo</p>	<ul style="list-style-type: none"> a. Operational plans and procedures for the loading, discharge, vessel-to-vessel transfer, and condition maintenance of oil cargoes are implemented in accordance with operational and regulatory requirements b. Personnel involved in oil operations are correctly supervised in accordance with company and regulatory requirements c. Oil cargo vessel-to-vessel transfer procedures are correctly carried out in accordance with operational and regulatory requirements d. Checklists are correctly used in accordance with tanker procedures e. Oil cargo is correctly monitored and maintained in accordance with established procedures and oil tanker practice f. Oil cargo sampling and testing is carried out in accordance with established tanker procedures and regulatory requirements g. Established procedures and precautions are applied during tank cleaning operations h. Load-on-top, ballasting and de-ballasting procedures for a oil tanker are followed in accordance with operational requirements, established oil tanker practice and regulatory requirements i. Required communication with relevant personnel is correctly and constantly maintained throughout loading, discharging, handling and condition maintenance operations involving oil cargo

<p>3. Ensure the implementation of safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Appropriate personal protection clothing and equipment is correctly used throughout loading, discharge, handling and condition maintenance operations involving oil cargo b. Hazard minimisation and safety precautions for the loading, discharging and handling of oil products are carried out in accordance with regulatory requirements and established oil tanker practice c. Appropriate monitoring equipment is correctly used throughout loading, discharge, handling and condition maintenance operations d. Emergency situations during loading or discharging of cargo or cargo condition monitoring and maintenance are identified and acted upon in accordance with established tanker emergency procedures and regulatory requirements
<p>4. Implement pollution prevention measures</p>	<ul style="list-style-type: none"> a. Air and water pollution prevention procedures are implemented in accordance with established tanker practice and regulatory requirements b. Required action is taken in the event of an oil spillage in accordance with regulatory requirements and established oil tanker procedures c. All relevant information is immediately reported to appropriate officials when a spill is detected or when a malfunction has occurred which may poses a risk of a spill d. Shore-based personnel are immediately notified of an oil spill e. Shipboard spill containment and emergency procedures are initiated in accordance with established tanker practice and regulatory requirements
<p>5. Complete cargo handling documentation</p>	<ul style="list-style-type: none"> a. Correct reports are completed relating to oil cargo handling operations and incidents in accordance with established procedures and regulatory requirements b. All cargo handling documentation is completed in accordance with requirements and regulations

Range Of Variables

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF OIL CARGOES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW 95 Code and Convention, ISM Code, tanker safety guides and port regulations related to oil tanker cargo operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of operational and supervisory principles and procedures, safety precautions and hazard minimisation strategies to the management of the loading, discharge, handling and condition maintenance of cargo on a oil tanker. Contribution to the development of a broad plan for oil cargo handling, monitoring and maintenance operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the handling, monitoring and maintenance of cargo on a oil tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international oil tanker b. Oil cargo handling operations may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during tank cleaning b.6. during crude oil washing procedures b.7. during oil cargo monitoring and maintenance b.8. during oil cargo sampling c. Operational cargo handling cycle of a oil tanker may include: <ul style="list-style-type: none"> c.1. oil loading preparation and operations c.2. load-on-top operations c.3. monitoring and maintenance operations during a loaded voyage c.4. oil discharging preparation and operations c.5. tank-stripping and cleaning operations c.6. ballasting operations c.7. maintenance operations during a ballast voyage c.8. de-ballasting operations d. Oil cargo handling systems and equipment may include: <ul style="list-style-type: none"> d.1. pumps and pumping arrangements and venting and vapour-return systems, piping systems and valves d.2. filters and strainers d.3. expansion devices d.4. flame screens d.5. commonly used inert gases d.6. storage, generation and distribution systems d.7. temperature and pressure monitoring systems d.8. inert gas systems d.9. gas-freeing systems d.10. cargo gauging, instrumentation systems and alarms d.11. gas detection and monitoring systems e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks and goggles e.2. breathing apparatus e.3. resuscitation equipment e.4. protective clothing, including headgear, gloves and footwear e.5. escape and rescue equipment f. Hazards associated with oil cargoes may include: <ul style="list-style-type: none"> f.1. sources of ignition leading to explosion and fire f.2. electrostatic generation leading to discharge f.3. environmental hazards to air and water f.4. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.5. spills or release of toxic fluids, vapours and gases, involving skin contact and inhalation f.6. corrosion hazards to personnel, vessel structures and equipment f.7. working in confined spaces

Range Of Variables (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF OIL CARGOES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. established tanker and company oil cargo operations procedures a.1. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to oil tankers a.4. 'International Safety Guide for Oil Tankers and Terminals' ICS/OCIMF a.5. 'Ship to Ship Transfer Guide (Petroleum)' ICS/OCIMF a.6. 'Clean Seas Guide for Oil Tankers (Retention of Oil Residues on Board)' ICS/OCIMF a.7. material data safety sheets a.8. tanker manufacturer's instructions and recommended procedures a.9. OHS procedures relevant to the handling of oil cargoes a.10. instructions of relevant Maritime Authorities concerning oil cargo operations a.11. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include:</p> <ul style="list-style-type: none"> a.1. sections of the IMO STCW 95 Code and Convention related to oil tankers a.2. relevant sections of AMSA Marine Orders a.3. instructions of relevant Maritime Authorities concerning oil cargo operations a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF OIL CARGOES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage the safe loading, discharge, handling and condition maintenance of cargo on a oil tanker a.2. Ensure all required safety and hazard control procedures are implemented during loading, discharge, handling and condition maintenance operations a.3. Identify typical problems that may occur during oil cargo loading, discharge, handling and condition maintenance operations and take appropriate action a.4. Identify emergency situations that may arise during oil operations and take appropriate action a.5. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to oil tanker cargo operations a.6. Communicate effectively with others during oil cargo handling and maintenance operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of the master of a oil tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for oil tankers b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures a. The basic principles and trends in oil tanker design and the cargo containment and handling systems. <ul style="list-style-type: none"> a.1. typical piping and pumping arrangements a.2. typical deck arrangements a.3. cargo tank arrangements a.4. types of cargo pumps and their application to various types of oil and petroleum cargo a.5. tank cleaning, gas freeing and inerting systems a.6. the major components of an inert gas plant a.7. cargo tank venting and accommodation ventilation systems and procedures a.8. the requirements of shipboard gauging systems and their associated instrumentation and alarms a.9. the requirements for cargo heating systems on oil tankers a.10. the safety aspects of electrical systems on oil tankers b. Procedures and regulatory requirements for loading, discharge, handling and condition monitoring of oil cargo including: <ul style="list-style-type: none"> b.1. cargo loading and discharging preparations and procedures b.2. loading and discharge plans for multiple grade tanker cargoes with due regard to cargo segregation and cargo care on passage. b.3. loading and discharging procedures including vessel-to-vessel transfers b.4. the use of check lists including the vessel/shore checklist. b.5. the importance of correct supervision and use of monitoring equipment b.6. the procedure for tank cleaning and gas freeing operations b.7. crude oil washing procedures b.8. the use and maintenance of inert gas atmospheres during cargo handling operations and its role in the gas freeing process b.9. regulations and procedures for the control of entry into pumprooms and confined spaces b.10. the principle of operation of gas detection equipment b.11. appropriate gas detection equipment for given shipboard scenarios b.12. the use of load-on-top techniques are explained. b.13. proper ballasting and de-ballasting procedures are described. b.14. procedures to prevent air and water pollution including disposals of wastes and washings b.15. emergency procedures, i.e. pre-planned action in the event of leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty c. Oil cargo handling systems and equipment and the procedures for their use d. The chemical and physical characteristics of oil cargoes, including: <ul style="list-style-type: none"> d.1. the basic chemistry of hydrocarbons and simple chemical reactions d.2. the physical characteristics of various types of oil cargoes d.3. the practical significance of flashpoint, flammable range and auto-ignition temperature

Evidence Guide (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF OIL CARGOES

<p>3. Required knowledge and skills (continued)</p>	<p>e. The hazards associated with oil cargoes, including:</p> <ul style="list-style-type: none"> e.1. an understanding of the types of hazards and their causes e.2. safety and hazard minimisation procedures used on oil tankers e.3. the sources of ignition that may be present on tankers e.4. the principles of electrostatic generation are described, and the possible situations which might lead to a discharge aboard a tanker e.5. the design features of the vessels which minimise or eliminate the major hazards e.6. the health hazards of oil cargoes and the means to prevent safety incidents <p>f. Principles and procedures for emergency operations on an oil tanker, including:</p> <ul style="list-style-type: none"> f.1. the importance of developing tanker emergency plans f.2. techniques for emergency shutdown of cargo operations f.3. actions to be taken in the event of failure of services essential to oil cargo f.4. actions to be taken following a collision, grounding or spillage, including a vapour release from an oil tanker f.5. the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, rescue equipment, decontamination equipment and protective clothing and equipment f.6. the procedures for entry into and effecting a rescue from enclosed spaces <p>g. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of oil cargo</p>
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to manage the safe loading, discharge, handling and condition maintenance of cargo on a oil tanker, and/or b. manage the safe loading, discharge, handling and condition maintenance of cargo on a on board an operational oil tanker
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 managing the safe loading, discharge, handling and condition maintenance of cargo on a oil tanker a.2 identifying and evaluating oil cargo handling problems and determining an appropriate courses of action a.3 identifying and implementing improvements to oil cargo handling procedures a.4 applying safety and hazard control precautions relevant to oil cargo handling operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the conduct of maintenance on liquefied gas tankers b.4 relevant manufacturer's guidelines relating to the use of oil cargo handling plant and equipment, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes b.6 pollution management processes c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF OIL CARGOES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MA7 01A MONITOR THE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to monitor and maintain the safe and efficient loading, stowage, security and unloading of cargo on a commercial vessel.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2

ELEMENT	PERFORMANCE CRITERIA
<p>1. Supervise the loading, stowage and unloading of general cargo</p>	<ul style="list-style-type: none"> a. Instructions are given to crew and others involved in the cargo operations in accordance with the plan for loading, unloading or stowage of the cargo b. Preparations for loading, stowage and unloading are monitored in accordance with procedures and stowage plan c. Compliance with relevant regulations, procedures and instructions pertaining to the type of cargo to be handled is checked prior to and during operations d. Techniques used for cargo calculations and handling are monitored to ensure their appropriateness according to the type of cargo to be loaded, stowed or unloaded e. Checks are made to ensure that cargo is correctly identified, inspected and confirmed against documentation prior to commencement of loading, unloading and stowage operations f. Loading, stowage and unloading operations are monitored against procedures and stowage plan for the type of cargo involved g. Communication is clear, concise and acknowledged at all times according to good cargo handling practice and regulations
<p>2. Ensure compliance with safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Safety and hazard control management plan for cargo operations is implemented in accordance with company procedures and regulatory requirements b. Checks are made to ensure tests and inspections on cargo handling equipment are correctly conducted in accordance with regulations and company procedures c. Cargo handling hazards are identified and action is taken to minimise or eliminate risk to personnel, cargo, vessel and the environment d. Safety and hazard minimisation procedures and regulations are maintained at all times during cargo handling operations e. Where relevant, precautions and procedures necessary for gas-freeing a tank and for the entry of personnel into a tank are supervised f. Where relevant, procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are supervised g. Action is taken in the event of a cargo handling incident or emergency to secure the cargo and the vessel and maintain the safety of the vessel and persons involved h. In the event of a safety incident or emergency, a safety incident report and other required documentation on a safety incident is prepared and processed in accordance with company procedures
<p>3. Supervise ballast management operations</p>	<ul style="list-style-type: none"> a. Checks are made to ensure ballast requirements of port authority are identified and interpreted b. Ballast management procedures are supervised in accordance with company procedures and port authority requirements c. Ballast management problems are identified and necessary action taken to minimise risk to the environment

4. **Complete cargo handling documentation**

- a. Independent cargo surveyors are used in the loading stowage and unloading of cargo in accordance with company procedures
- b. Correct log book entries are made relating to cargo handling operations and incidents
- c. A letter of protest is used in any untoward incident relating to cargo operations and care
- d. All cargo handling documentation is completed in accordance with requirements and regulations

Range Of Variables

MONITOR THE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed relatively independently within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the monitoring and supervision of a significant range of cargo handling operations across a wide and often unpredictable variety of cargo types and operational contexts. Monitoring and overseeing the implementation of a broad plan or strategy for cargo handling operations and stowage is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires limited responsibility in the management of functions related to cargo handling operations and procedures.
2. Worksite environment	<ul style="list-style-type: none"> a. Cargo may be loaded or unloaded from any Australian or international commercial vessel b. Cargo handling operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. at various shoreside loading and discharge terminals c. Types of cargo may include: <ul style="list-style-type: none"> c.1. general cargo c.2. containers c.3. various types of solid bulk materials c.4. various types of bulk liquids c.5. special and abnormal cargo such as: <ul style="list-style-type: none"> c.5.1. refrigerated cargo and containers c.5.2. pig iron, ingots and steel billets c.5.3. mineral concentrates c.5.4. extra heavy cargo d. Cargo handling equipment may include: <ul style="list-style-type: none"> d.1. single swinging derricks d.2. union purchase derricks d.3. ship-board cranes d.4. terminal based cranes d.5. pumps, valves and hoses e. Cargo handling hazards may include: <ul style="list-style-type: none"> e.1. faulty cargo handling equipment e.2. damaged cargo e.3. cargo handling operations in poor weather or sea conditions e.4. incorrectly stowed cargo e.5. incorrectly lashed or secured cargo e.6. using equipment beyond safe working limits e.7. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. cargo handling operational orders and instructions a.3. relevant maritime regulations a.4. vessel's log a.5. vessel's 'Cargo Securing Manual' a.6. vessel's Register of Materials Handling Equipment a.7. vessel / shore safety checklist a.8. company cargo handling procedures a.9. cargo handling equipment manufacturer's instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards and regulatory requirements

Range Of Variables (continued)

MONITOR THE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. sections of IMO STCW 95 Code and Convention related to cargo handling a.2. relevant sections of AMSA Marine Orders including a.2.1. Part 32 as it relates to cargo gear a.2.2. Part 34 as it relates to solid bulk cargoes a.2.3. Part 43 as it relates to livestock a.3. Australian USL Code a.4. relevant international, Australian and State/Territory OH&S legislation a.5. International Grain Code a.6. Lumber Loadline requirements and the Code of Safe Practice for Ships carrying Timber Deck Cargo

Evidence Guide

MONITOR THE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor and supervise cargo handling operations <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. across a representative range of typical cargo handling contexts a.2. Ensure compliance with all required safety, environmental and hazard control precautions and procedures when overseeing the handling of cargo during loading / unloading and stowage operations a.3. Identify typical cargo handling problems and hazards and take appropriate action a.4. Communicate effectively with others during cargo handling operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory cargo handling/vessel stability units that form part of a job role of an officer on a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S and cargo handling legislation, codes of practice, policies and procedures c. Procedures and documentation required in the event of a safety incident when managing cargo-handling operations d. Methods for handling various types of cargo e. Operational characteristics of different types of ship-board and terminal-based cargo handling equipment and facilities f. Ways of restricting vessel's stress levels within permitted limits during loading / discharging of dry bulk cargoes g. Typical cargo handling hazards and problems and appropriate preventative and remedial action and solutions h. Effects of different types of cargo operations on vessel's trim and stability i. Procedures for carrying out calculations involving weights, capacities, stowage factors, load densities, etc., including: <ul style="list-style-type: none"> i.1. calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal loadline zones i.2. calculating the stresses on lifting gear used in cargo handling operations i.3. determining a vessel's displacement by draught survey i.4. determining the forces acting on equipment used to lash cargo i.5. calculating the longitudinal stresses acting on a vessel's hull using both manual and computer techniques j. Effects on cargo handling of wind and weather k. Ballast management issues and procedures l. Typical types and sizes of shipping containers m. Standard stowage position numbering systems used on container vessels n. Factors that affect the reading of a vessel's draught o. IMDG Code p. Cargo handling communication techniques q. Cargo handling documentation requirements including documentation to limit claims on cargo carried
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. monitor and supervise suitably-simulated cargo loading / unloading operations over an appropriate range of cargo handling situations, weather and operational conditions; and/or b. monitor and supervise the actual cargo loading / unloading operations of a vessel

Evidence Guide (continued)

MONITOR THE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 monitoring and supervising cargo handling operations a.2 identifying and evaluating cargo handling problems and determining an appropriate courses of action a.3 identifying and implementing improvements to cargo handling procedures a.4 applying safety precautions relevant to cargo handling operations a.5 assessing operational capability of cargo handling equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.6 security procedures b.7 following on-board housekeeping processes c. Action taken promptly to report and/or rectify accidents and safety incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
<p>Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MA8 01A MONITOR THE CARE OF CARGO DURING A VOYAGE

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to monitor and supervise the safe care of cargo during a voyage of a commercial vessel.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2, and the section of the Australian USL Code dealing with the competency requirements of a Master Class 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Monitor the care of cargo during a voyage</p>	<ul style="list-style-type: none"> a. The cargo being carried is identified and its characteristics established prior to the voyage b. Relevant regulations, procedures and instructions pertaining to the type of cargo being carried are accessed, interpreted and applied during the voyage c. The vessel's cargo stowage plan is interpreted in accordance with company procedures d. The vessel's plan for the care of cargo during the voyage is implemented in accordance with company and customer requirements and relevant regulations e. Action required to maintain the well-being of cargo during the voyage is initiated and monitored in accordance with company procedures and customer requirements f. The control of cargo sweat using shipboard ventilation and humidity control systems is monitored and supervised g. Where relevant, required supervision of the care of livestock is carried out as required by company and customer requirements and relevant regulations h. Communication with relevant personnel is clear, concise and acknowledged at all times according to good cargo care practice and regulations
<p>2. Monitor compliance with safety and hazard control procedures for cargo during a voyage</p>	<ul style="list-style-type: none"> a. Cargo stowage hazards are identified and action is taken to minimise or eliminate risk to personnel, cargo, vessel and the environment b. Compliance with safety and hazard minimisation procedures and regulations related to cargo care is monitored at all times during a voyage to maintain the safety of personnel, cargo and vessel c. Action is taken in the event of a cargo-related incident or emergency to rectify the problem, secure the cargo and the vessel and maintain the safety of the vessel and persons involved d. Where relevant, precautions and procedures necessary for gas-freeing a tank and for the entry of personnel into a tank are supervised e. Where relevant, procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are supervised
<p>3. Complete cargo care documentation</p>	<ul style="list-style-type: none"> a. Correct log book entries are made relating to cargo care operations and incidents during a voyage and other documentation is completed as required by company procedures and statutory regulations b. A letter of protest is used in any untoward incident relating to cargo operations and care c. All cargo reports and documentation are completed in accordance with requirements and regulations

Range Of Variables

MONITOR THE SAFE CARE OF CARGO DURING A VOYAGE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant regulations. b. Work is performed relatively independently within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the monitoring and supervision of a significant range of cargo care operations across a wide and often unpredictable variety of cargo types and operational contexts. Monitoring and supervising the implementation of a broad plan or strategy for cargo care operations and stowage is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires limited responsibility in the management of functions related to cargo care operations and procedures.
2. Worksite environment	<ul style="list-style-type: none"> a. Cargo may be as carried on any Australian or international commercial vessel b. Cargo care operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible sea and weather conditions c. Types of cargo may include: <ul style="list-style-type: none"> c.1. general cargo c.2. containers c.3. various types of solid bulk materials c.4. various types of bulk liquids c.5. various types of liquefied gas c.6. special and abnormal cargo such as: <ul style="list-style-type: none"> c.6.1. refrigerated cargo and containers c.6.2. pig iron, ingots and steel billets c.6.3. livestock c.6.4. mineral concentrates c.6.5. extra heavy cargo d. Cargo care hazards may include: <ul style="list-style-type: none"> d.1. damaged cargo d.2. cargo security in poor weather or sea conditions d.3. incorrectly stowed cargo d.4. incorrectly lashed or secured cargo d.5. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. cargo care operational orders and instructions a.3. relevant maritime regulations a.4. vessel's log a.5. vessel's 'Cargo Securing Manual' a.6. vessel's Register of Materials Handling Equipment a.7. vessel / shore safety checklist a.8. company cargo care procedures a.9. cargo care equipment manufacturer's instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards and regulatory requirements

Range Of Variables (continued)

MONITOR THE SAFE CARE OF CARGO DURING A VOYAGE

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none">a. Applicable procedures and codes may include<ul style="list-style-type: none">a.1. relevant sections of IMO STCW 95 Code and Conventiona.2. relevant sections of AMSA Marine Orders including<ul style="list-style-type: none">a.2.1. Part 34 as it relates to solid bulk cargoesa.2.2. Part 43 as it relates to livestocka.3. Australian USL Codea.4. ISM Codea.5. relevant international, Australian and State/Territory OH&S legislationa.6. International Grain Codea.7. Lumber Loadline requirements and the Code of Safe Practice for Ships carrying Timber Deck Cargo

Evidence Guide

MONITOR THE SAFE CARE OF CARGO DURING A VOYAGE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor cargo care operations: <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. across a representative range of typical cargo carriage contexts a.2. Exercise all required safety, environmental and hazard control precautions and procedures when monitoring and supervising the care of cargo during a voyage a.3. Identify typical cargo care problems and hazards and take appropriate action a.4. Communicate effectively with others during cargo care operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other cargo handling/vessel stability units that form part of a job role of an officer on a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation, codes of practice, policies and procedures c. Principles of cargo care, including: <ul style="list-style-type: none"> c.1. causes of cargo damage, their effect and preventative measures c.2. methods of temperature control of reefer cargoes c.3. causes effects and prevention of sweat, including the control of vessel and cargo sweat during a voyage including the use of shipboard ventilation and humidity control systems c.4. differences between vessel's sweat and cargo sweat and reasons for the formation of both c.5. principles of cargo ventilation including methods and systems c.6. function of dunnage c.7. cargo damage survey methods d. Procedures and documentation required in the event of a safety incident when managing cargo care operations during a voyage e. Methods for caring for various types of cargo during a voyage f. Operational characteristics of different types of ship-board cargo care equipment and facilities g. Hazards and problems associated with the carriage of various types of cargo and appropriate preventative and remedial action and solutions h. Effects of different types of cargo on vessel's trim and stability i. Procedures for carrying out calculations involving weights, capacities, stowage factors, load densities, etc., including: <ul style="list-style-type: none"> i.1. calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal loadline zones i.2. determining a vessel's displacement by draught survey i.3. determining the forces acting on equipment used to lash cargo i.4. calculating the longitudinal stresses acting on a vessel's hull using both manual and computer techniques j. Effects on cargo of wind, weather and sea conditions during a voyage k. Typical types and sizes of shipping containers l. Standard stowage position numbering systems used on container vessels m. IMDG Code n. Cargo care communication techniques o. Cargo care documentation requirements including documentation to limit claims on cargo carried
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan and manage suitably-simulated cargo care operations over an appropriate range of situations, weather and operational conditions; and/or b. plan and manage the actual cargo care operations during the voyage of a vessel

Evidence Guide (continued)

MONITOR THE SAFE CARE OF CARGO DURING A VOYAGE

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 planning and overseeing cargo care operations a.2 identifying and evaluating cargo care problems and determining an appropriate courses of action a.3 applying safety precautions relevant to cargo care operations a.4 assessing operational capability of cargo care equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 manufacturer's guidelines relating to the use of relevant vessel's machinery, including instructions on equipment capability and limitations b.6 security procedures b.7 following on-board housekeeping processes <p>c. Action taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MA9 01A PREPARE A CARGO PLAN FOR CARGO LOADING AND UNLOADING OPERATIONS

Field MA Handling Cargo and Vessel Security

DESCRIPTION:

This unit involves the skills and knowledge required to prepare a cargo operations plan for a commercial vessel of up to 80 metres in length, including the procedures for loading, unloading and distributing cargo on the vessel, appropriate emergency procedures for incidents involving dangerous and hazardous cargoes, suitable procedures for cargo monitoring and specifications for safety procedures that conform with maritime practice and OH&S requirements.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Master Class 4.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Develop plan for safe cargo operations</p>	<p>a. The cargo to be loaded or unloaded is identified and its characteristics and dimensions established</p> <p>b. Relevant regulations, procedures and instructions pertaining to the type of cargo to be loaded and unloaded are accessed and interpreted prior to developing plan for cargo operations</p> <p>c. The conditions of assignment of loadlines, their maintenance and use are correctly interpreted and applied</p> <p>d. Required communications between the vessel and the shore terminal prior to the vessel's arrival at a port are specified in the cargo operations plan</p> <p>e. Procedures for calculating the longitudinal stresses acting on vessel's hull for the planned cargo configurations and distributions are in accordance with maritime practice and company guidelines</p> <p>f. Procedures for calculating the trim and stability of the vessel during loading / unloading operations are in accordance with maritime practice and company guidelines</p> <p>g. Techniques to be used for cargo identification, inspection, calculations and handling are outlined in the plan including any special procedures for dangerous and hazardous cargoes</p> <p>h. The vessel's cargo operations plan is prepared and interpreted in accordance with established procedures</p>
<p>2. Incorporate safety and hazard control procedures in cargo operations plan</p>	<p>a. Appropriate tests and inspections on cargo handling equipment are included in plan in accordance with regulations</p> <p>b. Cargo handling hazards are identified and action is planned to minimise or eliminate risk to personnel, cargo, vessel and the environment</p> <p>c. Specifications are provided for safety and hazard minimisation procedures and regulations to be followed at all times during cargo handling operations</p> <p>d. Where relevant, precautions and procedures necessary for gas-freeing a tank and for the entry of personnel into a tank are correctly specified in the plan</p> <p>e. Where relevant, procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are correctly specified in the plan</p> <p>f. Information is provided in the plan of procedures to be taken in the event of a cargo handling incident or emergency to secure the cargo and the vessel and maintain the safety of the vessel and persons involved</p>
<p>3. Complete cargo handling documentation</p>	<p>a. Cargo operations plan is documented and stored in accordance with company procedures and maritime requirements</p> <p>b. Cargo operations plan is communicated to others using appropriate methods</p>

Range Of Variables

PREPARE A CARGO PLAN FOR CARGO LOADING AND UNLOADING OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others. It involves the conduct of routine procedures for the planning of cargo loading and unloading operations onboard a vessel and the specification of solutions to a defined range of typical cargo loading and unloading situations. Some discretion and judgement is required in anticipating and allowing for possible cargo loading and unloading problems, safety hazards and contingencies and the actions to be taken in these eventualities.
2. Worksite environment	<ul style="list-style-type: none"> a. Cargo loading and unloading plan may relate to any Australian commercial vessel up to 80 metres in length b. Cargo loading and unloading operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather b.3. at various shoreside loading and discharge terminals c. Types of cargo may include: <ul style="list-style-type: none"> c.1. general cargo c.2. containers c.3. various types of solid bulk materials c.4. various types of bulk liquids c.5. special and abnormal cargo such as: <ul style="list-style-type: none"> c.5.1. refrigerated cargo and containers c.5.2. pig iron, ingots and steel billets c.5.3. mineral concentrates c.5.4. dangerous or hazardous cargo c.5.5. extra heavy cargo d. Cargo handling equipment may include: <ul style="list-style-type: none"> d.1. block and tackle d.2. single swinging derricks d.3. union purchase derricks d.4. ship-board cranes d.5. terminal based cranes d.6. pumps, valves and hoses e. Cargo handling hazards may include: <ul style="list-style-type: none"> e.1. faulty cargo handling equipment e.2. damaged cargo e.3. cargo handling operations in poor weather or sea conditions e.4. incorrectly stowed cargo e.5. incorrectly lashed or secured cargo e.6. using equipment beyond safe working limits e.7. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant regulations a.2. cargo handling operational orders and instructions a.3. relevant sections of Australian USL Code a.4. vessel / shore safety checklist a.5. cargo handling procedures a.6. cargo handling equipment manufacturer's instructions and recommended procedures a.7. instructions of relevant Maritime Authorities

Evidence Guide

PREPARE A CARGO PLAN FOR CARGO LOADING AND UNLOADING OPERATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan cargo loading and unloading operations across a representative range of typical cargo handling contexts for a vessel up to 80 metres in length a.2. Ensure compliance with all required safety, environmental and hazard control precautions and procedures when planning the handling of cargo during loading / unloading and stowage operations a.3. Identify typical cargo handling problems and hazards and plan for appropriate action a.4. Communicate effectively with others when developing a cargo operations plan
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of master of a vessel of up to 80 metres in length.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant regulations b. Relevant OH&S and cargo handling legislation and policies c. Procedures and documentation required in the event of a safety incident during cargo operations d. Typical operational characteristics of different types of ship-board and terminal-based cargo handling and securing equipment and facilities e. Methods for handling various types of cargo including purchases and tackle f. Basic ways of restricting vessel's stress levels within permitted limits during cargo operations on a small vessel g. Effects of different types of cargo operations on vessel's trim and stability h. Procedures for calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal loadline zones i. Procedures for calculating the stresses on lifting gear used in cargo handling operations j. Typical cargo handling hazards and problems and appropriate preventative and remedial action and solutions k. Effects on cargo handling of wind and weather l. Cargo identification codes including IMDG code and Bulk Cargo Code m. Ballast management issues and procedures n. Typical types and sizes of shipping containers o. Basic procedures for determining a vessel's displacement by draught survey p. Factors that affect the reading of a vessel's draught q. Procedures for determining the forces acting on equipment used to lash cargo r. Basic procedures for calculating the longitudinal stresses acting on a vessel's hull using both manual and computer techniques s. Cargo handling communication techniques t. Cargo handling documentation requirements including documentation to limit claims on cargo carried
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. monitor and supervise suitably-simulated cargo loading / unloading operations over an appropriate range of cargo handling situations, weather and operational conditions; and/or b. monitor and supervise the actual cargo loading / unloading operations of a vessel

Evidence Guide (continued)

PREPARE A CARGO PLAN FOR CARGO LOADING AND UNLOADING OPERATIONS

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning cargo loading and unloading operations a.2 identifying and evaluating cargo handling problems and determining appropriate courses of action a.3 determining stress levels that may occur during cargo loading and unloading operations a.4 assessing operational capability of cargo handling equipment a.5 specifying safety precautions to be used during cargo loading and unloading operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of cargo handling machinery, including instructions on equipment capability and limitations c. Action taken promptly to report and/or rectify accidents and safety incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	2	2	2	1

TDM MA10 01A CONTROL TRIM, STABILITY AND STRESS

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to control the trim and stability of a commercial vessel and the stresses on its hull and structure both under normal operating conditions and in the event of flooding following damage to one or more compartments.

The unit is consistent with the related functional standard in Sections A II/1 and A III/1 of the STCW 95 Code and Appendix 2 and Appendix 3 of Marine Orders Part 3.

ELEMENT	PERFORMANCE CRITERIA
1. Control of the trim and stability of a vessel under normal operating conditions	<ul style="list-style-type: none">a. Stability analysis and weight distribution planning are conducted at a time, frequency and scope appropriate to the proposed nature of the voyage or vessel operationb. Weight distribution is organised to maintain the vessel within acceptable stability limits for anticipated operation situations likely to be experienced during the voyagec. Calculations are made to determine the draught and centre of gravity of the vessel after adding, removing or shifting weightd. Trim, draughts and list of the vessel are controlled as required to ensure they are suitable to progress all anticipated vessel operations
2. Control of the trim and stability of a vessel in the event of damage and consequent flooding	<ul style="list-style-type: none">a. Damage to the vessel and the nature of flooding of compartments is promptly assessedb. The effects upon vessel stability of flooded and flooding compartments is evaluatedc. A suitably strategy for maintaining or restoring trim and stability is devisedd. Where stress limits of a vessel are unavoidably exceeded as a consequence of damage and/or flooding, appropriate action is initiated to ensure the safety of shipboard personnel including where necessary abandoning the vessel
3. Manage the stress conditions of the vessel	<ul style="list-style-type: none">a. Stress limits of vessel are assessed in accordance with maritime principles and vessel manufacturer's specificationsb. Stability of vessel is monitored at a frequency and scope relevant to the nature and speed of vessel operations or emergency and is sufficient to enable stress and stability to be maintained within acceptable limits at all timesc. Appropriate action is taken promptly where weight distribution has or could exceed acceptable safety limits to ensure that the safety of the vessel and its passengers, crew and load is maximised

Range Of Variables

CONTROL TRIM, STABILITY AND STRESS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of fundamental principles of vessel construction and theories of trim and stability and stress in the development and implementation of measures to preserve the trim and stability of a vessel across a wide and often unpredictable range of normal and emergency operational contexts. The development of a broad strategy and techniques for controlling vessel trim, stability and stress is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in technical, organisational and leadership functions related to controlling the trim and stability of vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) b. Measures to control the trim and stability of the vessel may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while loading and unloading b.4. while underway b.5. during berthing and unberthing operations b.6. while anchoring or mooring b.7. when bunkering c. Measures to control the trim and stability of the vessel may include: <ul style="list-style-type: none"> c.1. adjusting weight distribution of load c.2. pumping ballast water to compensate for load distribution c.3. pumping of flooded compartments c.4. implementing damage control measures to maximise watertight integrity of hull where it has been damaged
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. IMO Conventions and Codes a.4. AMSA Marine Orders a.5. IMO SOLAS Convention a.6. vessel's log a.7. 'Trim and Stability Booklet' a.8. company procedures a.9. vessel manufacturer's instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards a.12. Class Society Rules
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO Codes and Conventions related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders concerning vessel trim and stability a.3. IMO SOLAS Convention a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

CONTROL TRIM, STABILITY AND STRESS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor and control the trim and stability of the vessel <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. when loading and unloading a.1.4. when underway a.1.5. in berthing and unberthing operations a.1.6. when anchoring or mooring a.1.7. when bunkering a.2. Communicate effectively with others concerning operations to maintain the trim, stability and stresses of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master or chief mate on a ship of 500 gross tonnage or more, or a chief engineer officer or second engineer officer on a ship of 3,000kW propulsion power or more. The second engineer must also be able to take over the chief engineer's duties in an emergency situation.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of the IMO Conventions and Codes and AMSA Marine Orders b. Relevant OH&S legislation, codes of practice, policies and procedures c. Theory and calculations of vessel stability and dynamics including: <ul style="list-style-type: none"> c.1. computation of hydrostatic stability data of a ship c.2. calculation of a ship's centre of gravity, centre of buoyancy and metacentre c.3. calculation of the transverse and longitudinal stability using hydrostatic data c.4. calculation of the moment of statical stability at small angles of heel c.5. determination of the centre of gravity of a ship using an inclining experiment and effect of suspended weights c.6. determining the required correction for the height of centre of gravity (kg) for the free surface effect c.7. determination of the values of the righting lever and construction of righting lever curves c.8. Calculations for change of draught, trim and heel when entering different water densities and due to bilging of compartments. c.9. changes to draught, trim and heel due to adding or removing fuel, ballast or cargo c.10. displacement, wetted surface, form coefficients, tonne per centimetre immersion, application of Simpson's rules to first and second moments of area, centroids and centres of pressure. d. Potential problems related to the control of trim and stability for vessels of 500 gross tonnage or more and appropriate action and solutions, including: <ul style="list-style-type: none"> d.1. free surface of a liquid d.2. shift of cargo d.3. wind heel d.4. handling of heavy weights d.5. excessive trim d.6. large swell conditions d.7. dry docking d.8. grounding e. Principles of synchronous rolling and methods for its control, including an understanding of the effect on the rolling period of a vessel due to the radius of gyration f. Causes and repercussions of a heeling vessel g. Principle features of the structure of a vessel h. Properties and application of materials used in vessel construction i. Construction, layout and subdivision requirements of a typical vessel, including and understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead j. Typical construction features, stress characteristics, forces on ships under various conditions or ships of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) k. The principal stresses which act on the structure of a vessel, including panting and pounding. l. Steps involved interpreting and analysing a vessel's dynamic stability and comparing it against the IMO's minimum stability criteria m. Basic procedures and precautions for the repair and maintenance of a vessel n. Effects of density of sea water on the draught and freeboard of a vessel

Evidence Guide (continued)

CONTROL TRIM, STABILITY AND STRESS

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> o. Features of the load-line and draught marks of a vessel and procedures for carrying out related calculations p. Procedures for calculating the required load distribution to achieve the desired trim q. Typical problems related to the control of trim and stability for ships of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) and appropriate action and solutions, including: <ul style="list-style-type: none"> q.1. problems concerning the strength of structural members to resist liquid pressure and loading due to a head of liquid. q.2. problems involving shearing force and bending moments of a loaded ship in still water. r. Simple treatment of vibration. s. Bilge and ballast systems. t. Leveling arrangements for damaged side compartments.
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to maintain the trim and stability of a vessel in a range of operational situations, and/or b. maintain the trim and stability of a vessel in a range of operational situations either: <ul style="list-style-type: none"> b.1. using a simulator, meeting the requirements of Section A I/12 of the IMO STCW Code, over an appropriate range of simulated loading and operational situations b.2. in appropriate practical situations on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 controlling the trim and stability and managing the stresses of a vessel a.2 identifying and evaluating trim, stability and stress problems and determining an appropriate courses of action a.3 identifying and implementing improvements to procedures for the control of trim and stability of a vessel a.4 applying safety precautions relevant to manoeuvring operations a.5 assessing trim and stability of vessel in both normal and emergency situations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and Codes and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the trim, stability and stress limits of the vessel b.6 quality procedures (where existing) b.7 procedures to protect the integrity and security of the vessel's hull b.8 environmental protection procedures when pumping ballast water c. Action taken promptly to report and/or rectify out-of-limit trim, stability and stresses of the vessel in accordance with manufacturer's instructions, statutory requirements and company procedures d. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MA11 01A MAINTAIN THE STABILITY OF A VESSEL USING BASIC STABILITY INFORMATION

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to maintain the stability of a small commercial vessel using basic stability information.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Master Class 5.

ELEMENT	PERFORMANCE CRITERIA
1. Interpret basic stability criteria	<ul style="list-style-type: none"> a. Vessel's stability data book is located, accessed and correctly interpreted b. Interpreted basic stability data for the vessel is applied to maintain the stability of the small vessel in accordance with regulations
2. Manage the stability of a small vessel	<ul style="list-style-type: none"> a. The stability of the small vessel is monitored appropriately in accordance with the nature and speed of vessel's operations or an emergency situation where it exists b. Information obtained from the vessel's basic stability data book is used to maintain the vessel in a stable condition during operations c. Appropriate and prompt action is taken where stability factors have or could exceed acceptable safety limits d. Special precautions are taken where vessel operations may affect the stability and watertight integrity of the vessel e. Degree of vessel security is appropriate for the anticipated weather and sea conditions and planned vessel operations f. Prompt and appropriate action is taken where weight distribution is compromising vessel safety g. Timely and appropriate action is taken in anticipation of environmental changes that may affect the stability of the vessel h. Appropriate action is taken in emergency situations to maintain the stability of vessel within safe limits i. Instructions to others concerning vessel stability and related action are appropriate, timely, clear and concise

Range Of Variables

MAINTAIN THE STABILITY OF A VESSEL USING BASIC STABILITY INFORMATION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within defined operational procedures, with responsibility for own outputs and limited responsibility for others in maintaining the stability of a small vessel. It involves the application of basic principles of vessel stability when operating a small vessel within a range of predictable operational and emergency contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel up to 24 metres in length engaged on a coastal voyage b. Measures to control the stability of the vessel may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while loading and unloading b.4. while underway b.5. during berthing and unberthing operations b.6. while anchoring or mooring c. Factors that may have an adverse effect on small vessel stability which require special precautions and stability management include: <ul style="list-style-type: none"> c.1. effects of suspended weights when using cargo or fishing gear to load and discharge heavy weights c.2. dangers on board a fishing vessel when clearing a net which is caught fast on an underwater obstruction c.3. free surface effects c.4. water on the deck c.5. bilging c.6. poor security of cargo stowage c.7. movement of heavy items or stores and equipment on board vessel c.8. flooding in the event of damage to the hull c.9. alterations to the structure/construction of the vessel c.10. use and replenishment of consumables during a voyage such as fuel, food, etc. d. Means of managing the stability of a small vessel include: <ul style="list-style-type: none"> d.1. closing openings d.2. taking precautions during vessel operations that potentially alter the stress and stability conditions of the vessel d.3. taking precautions when using lifting equipment and associated gear d.4. managing the position, stowage and lashing of cargo, stores and equipment d.5. action to avoid or minimise cargo shift during a voyage d.6. managing the distribution of load on vessel d.7. ballast management d.8. damage control measures to maintain, stabilise or restore the watertight integrity of the hull during an emergency
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. vessel's stability data book a.3. relevant maritime regulations a.4. vessel's log a.5. small vessel manufacturer's instructions and recommended procedures a.6. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. sections of the Australian USL Code dealing with small vessel stability a.2. relevant Australian and State/Territory OH&S legislation

Evidence Guide

MAINTAIN THE STABILITY OF A VESSEL USING BASIC STABILITY INFORMATION

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage the stability of a small vessel <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. when loading and unloading a.1.4. when underway a.1.5. in berthing and unberthing operations a.1.6. when anchoring or mooring a.2. Communicate effectively with others concerning operations to maintain the stability of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a small commercial vessel up to 24 metres in length engaged on coastal voyages.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Basic stability theory including: <ul style="list-style-type: none"> c.1. principles of stability c.2. terms and definitions c.3. basic physics of stability c.4. relationship between weight and buoyancy in relation to floating bodies c.5. reserve buoyancy c.6. equilibrium c.7. impact of design and hull shape on stability d. Principle design features of small vessels related to stability and watertight integrity, including: <ul style="list-style-type: none"> d.1. principal parts of a small vessel and their function in relation to its stability and its structural and watertight integrity d.2. advantages and disadvantages of various materials used in the construction of small vessels d.3. openings in the hull and on the main deck of a small vessel and the safe working practices that must be followed to maintain watertight integrity d.4. maintenance and survey requirements necessary to maintain the watertight integrity of a small vessel e. The principal factors which affect the operational stability of a small vessel and the related measures that can be taken to maintain stability, including: <ul style="list-style-type: none"> e.1. adding and removing weights e.2. water on deck e.3. slack tanks e.4. roll period e.5. stiff and tender vessel e.6. additions and alterations to vessel f. An understanding of the information contained in the basic stability data book supplied to each small vessel and how this information is used to maintain the vessel in a stable condition during operations g. Effects of density of sea water on the draught and freeboard of a small vessel h. Factors which affect the rolling period of a small vessel i. Relationship between light displacement, loaded displacement and deadweight tonnage j. Differences between transverse and longitudinal stability and the causes of list and trim k. Conditions of stable, neutral and unstable equilibrium and the effects of disturbing a vessel from the upright l. Steps involved in bringing an unstable vessel to a stable condition m. Actions to be taken to contain flooding in the event of underwater damage to the hull n. Effects on the stability of a small vessel that has been 'bilged' o. Problems that may occur concerning the stability of small vessels up to 24 metres engaged on coastal voyages and appropriate precautionary/remedial action and solutions p. Maritime communication techniques

Evidence Guide (continued)

MAINTAIN THE STABILITY OF A VESSEL USING BASIC STABILITY INFORMATION

<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to maintain stability of a small vessel in a range of operational situations, and/or b. maintain the stability of a small vessel in a range of operational situations either: <ul style="list-style-type: none"> b.1. using an appropriate small vessel simulator over an appropriate range of simulated stability situations b.2. in appropriate practical situations during seetime on an operational commercial or training small vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 managing the stability and stresses of a small vessel a.2 identifying and stability problems and determining an appropriate courses of action a.3 identifying and implementing improvements to procedures for the management of the stability of a vessel a.4 applying safety precautions relevant to the maintenance of the stability of a small vessel a.5 assessing the stability of vessel in both normal and emergency situations using basic stability data b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to the stability of the small vessel b.5 procedures to protect the integrity and security of the vessel's hull b.6 environmental protection procedures when pumping ballast and bilge water c. Action taken promptly to report and/or rectify factors adversely affecting the stability of the small vessel d. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2

TDM MA12 01A MANAGE STRESS AND DYNAMIC FACTORS AFFECTING A SMALL VESSEL'S STABILITY

Field MA Handling Vessel and Cargo Stability

DESCRIPTION:

This unit involves the skills and knowledge required to manage the stress and dynamic factors affecting the stability of a small commercial vessel using basic stability criteria. This includes interpreting basic stability criteria, carrying out required stability calculations, correlating and interpreting calculated stability data, managing stability and stress conditions within safety parameters and communicating the stability information to others as required.

The unit is consistent with the sections of the Australian USL Code dealing with the competency requirements of a Master Class 4

ELEMENT	PERFORMANCE CRITERIA
1. Interpret basic stability criteria	<ul style="list-style-type: none"> a. Basic stability data book is located, accessed and interpreted in accordance with established procedures b. Interpreted basic stability data for the vessel is applied to stability analysis and the management of vessel stability in accordance with regulations
2. Calculate, correlate and interpret basic stability data	<ul style="list-style-type: none"> a. Basic stability calculations are accurately carried out in accordance with procedures and regulations b. Calculated stability data are correlated with basic stability criteria and interpreted correctly c. Tests and checks that are performed using computer-based stability programs are conducted at a frequency and scope that conform to manufacturer's instructions d. Spurious or false information from stability analysis is promptly recognised and re-calculated or ignored
3. Take action to manage stress and dynamic factors affecting vessel stability	<ul style="list-style-type: none"> a. The monitoring of stability and stress conditions of vessel is at a frequency and scope relevant to the nature and speed of vessel's operations or emergency and is sufficient to enable stress and stability to be maintained within acceptable limits at all times b. Appropriate action is taken promptly where stress and stability factors have or could exceed acceptable safety limits c. Appropriate precautions are taken where vessel operations may affect the stress and stability conditions of the vessel d. Degree of vessel security is appropriate for anticipated weather and sea conditions and necessary vessel operations e. Prompt and appropriate action is taken where weight distribution is compromising vessel safety f. Timely and appropriate action is taken in anticipation of environmental changes that may affect stresses and stability of the vessel. g. Action taken in emergency situations is appropriate to the significance of the situation and designed to maintain stresses and stability of vessel within safe limits h. Instructions to others are clear, concise, appropriate and timely
4. Maintain records of stability management	<ul style="list-style-type: none"> a. Appropriate records are kept of all action taken to monitor and manage the stress and dynamic factors affecting a vessel's stability b. Relevant information on vessel stability and action to manage stress and dynamic factors affecting vessel stability are correctly communicated to others as required

Range Of Variables

MANAGE STRESS AND DYNAMIC FACTORS AFFECTING VESSEL'S STABILITY

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in achieving the specified quality and quantity of outcomes. It involves the management of the stress and dynamic factors affecting a vessel's stability. Some discretion and judgement is required in anticipating and allowing for possible stress and stability problems, hazards and contingencies and the actions to be taken in these eventualities.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel engaged on coastal voyages b. Management of the stress and dynamic factors affecting a vessel's stability may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while loading and unloading b.4. while underway b.5. during berthing and unberthing operations b.6. while anchoring or mooring b.7. prior to departure b.8. in anticipation of adverse sea and weather conditions c. Factors that may have an adverse effect on vessel stability which require special precautions and stability management include: <ul style="list-style-type: none"> c.1. effects of suspended weights when using cargo or fishing gear to load and discharge heavy weights c.2. dangers on board a fishing vessel when clearing a net which is caught fast on an underwater obstruction c.3. free surface effects c.4. water on the deck c.5. bilging c.6. poor security of cargo stowage c.7. movement of heavy items or stores and equipment on board vessel c.8. flooding in the event of damage to the hull c.9. alterations to the structure/construction of the vessel c.10. use and replenishment of consumables during a voyage such as fuel, food, etc. d. Means of managing the stress and dynamic factors affecting the stability of a vessel include: <ul style="list-style-type: none"> d.1. closing openings d.2. taking precautions during vessel operations that potentially alter the stress and stability conditions of the vessel d.3. taking precautions when using lifting equipment and associated gear d.4. managing the position, stowage and lashing of cargo, stores and equipment d.5. action to avoid or minimise cargo shift during a voyage d.6. managing the distribution of load on vessel d.7. ballast management d.8. damage control measures to maintain, stabilise or restore the watertight integrity of the hull during an emergency
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. vessel's basic stability data book a.3. sections of the Australian USL Code dealing with vessel stability a.4. vessel's log a.5. vessel manufacturer's instructions and recommended procedures a.6. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. related to vessels of 500 gross tonnage or more a.2. relevant sections of Australian USL Code concerning the stability of small commercial vessels a.3. relevant Australian and State/Territory OH&S legislation

Evidence Guide

MANAGE STRESS AND DYNAMIC FACTORS AFFECTING VESSEL'S STABILITY

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Interpreting information obtain from a vessel's stability data book a.2. Carry out calculations associated with vessel stability using the required stability criteria, including interpreting and correlating the resultant data a.3. Manage the stress and dynamic factors affecting the stability of a small commercial vessel a.4. Communicate effectively with others concerning measures required to control the stability of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a small commercial vessel engaged on a coastal voyage.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. The principal stresses which act on the structure of a small vessel d. Construction features and stress characteristics for small commercial vessels engaged on coastal voyages e. Principles of small vessel stability including appropriate stability criteria required under regulatory requirements for the types of vessel concerned f. An understanding of the information contained in the simplified stability data book supplied to each small vessel and how this information is used to maintain the vessel in a stable condition during operations g. Procedures for carrying out calculations associated with vessel stability using basic stability criteria calculations, including interpreting and correlating the resultant data h. Factors which affect the rolling period of a vessel i. Relationship between light displacement, loaded displacement and deadweight tonnage j. Conditions of stable, neutral and unstable equilibrium and the effects of disturbing a vessel from the upright k. Steps involved in bringing an unstable vessel to a stable condition l. Problems and the stress and dynamic factors affecting the stability of small vessels engaged in coastal voyages and appropriate precautionary/remedial action and solutions m. Procedures for managing the stress and stability conditions of a vessel in preparation for adverse sea and weather conditions n. Procedures for managing the stress and stability conditions of a vessel during emergency situations that may involve flooding and/or damage to the hull and structure of the vessel o. Effects of density of sea water on the draught and freeboard of a vessel including the effects on a vessels draught when moving from fresh to salt water and vice versa p. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to manage the stress and dynamic factors affecting the stability of a small vessel in a range of operational situations, and/or b. assist in the management of the stress and dynamic factors affecting the stability of a small vessel engaged on a coastal voyage in a range of operational situations, either: <ul style="list-style-type: none"> b.1. using a suitable simulator over an appropriate range of simulated loading and operational situations b.2. in appropriate practical situations on an operational commercial or training vessel possible operation of a vessel during seetime training

Evidence Guide (continued)

MANAGE STRESS AND DYNAMIC FACTORS AFFECTING VESSEL'S STABILITY

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1 managing of the stress and dynamic factors affecting the stability of a small commercial vessel engaged on a coastal voyage</p> <p>a.2 calculating and interpreting data associated with stability management</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1 relevant maritime regulations</p> <p>b.2 OHS regulations and hazard prevention policies and procedures</p> <p>b.3 job procedures and work instructions</p> <p>b.4 relevant vessel manufacturer's guidelines relating to the trim, stability and stress limits of the vessel</p> <p>b.5 procedures to protect the integrity and security of the vessel's hull</p> <p>b.6 environmental protection procedures when pumping ballast water</p> <p>c. Action taken promptly to report and/or rectify out-of-limit trim, stability and stresses of the vessel</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	2	2	3	2	2

TDM MA16 01A MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

Field MA Handling Cargo and Vessel Stability

DESCRIPTION:

This unit involves the skills and knowledge required to manage the loading / unloading and embarkation / disembarkation procedures on roll-on roll-off vessels, including planning the loading / unloading operations and stability of the vessel, managing the loading / unloading and embarkation / disembarkation procedures, and supervising the opening, closing and securing the hull openings on a roll-on roll-off passenger vessel

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and e AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan the loading, and stability of the vessel</p>	<ul style="list-style-type: none"> a. Stability and stress information for a roll-on roll-off vessel is obtained and interpreted b. Stability and trim for various conditions of loading are calculated using stability calculators or computer programs provided c. Load factors are calculated for decks in accordance with established procedures d. The impact of ballast and fuel transfers on stability, trim and stress are calculated in accordance with established procedures e. Weight distribution is organised to maintain the vessel within acceptable stability limits for anticipated operation situations likely to be experienced during the voyage f. Calculations are made to determine the draught and centre of gravity of the vessel after adding, removing or shifting weight g. Trim, draughts and list of the vessel are controlled as required to ensure they are suitable to progress all anticipated vessel operations h. Plans for the loading / unloading, embarkation / disembarkation, and ballast and fuel management are prepared in accordance with established procedures, vessel's ISM Code Safety Management System, and regulatory requirements i. Checklists for use in the loading and embarkation of an ro-ro vessel are obtained or developed j. Operational plans and procedures for the loading/unloading, embarkation/disembarkation, and ballast and fuel management are documented and made available to relevant staff in accordance with tanker procedures and regulatory requirements
<p>2. Manage the loading / unloading and embarkation / disembarkation procedures</p>	<ul style="list-style-type: none"> a. Ramps are lowered and hoisted in accordance with established procedures b. Vehicles, rail cars and other cargo transport units are loaded and discharged in accordance with established procedures and loading plan c. Retractable vehicle decks are set-up and stowed in accordance with established procedures d. Special safeguards, procedures and requirements regarding the carriage of dangerous goods on board roll-on roll-off vessels are applied in accordance with regulations e. Passengers are embarked and disembarked in accordance with established procedures and embarkation plan f. Appropriate special attention is provided during embarkation and disembarkation procedures for disabled persons and persons needing assistance

<p>3. Open, close and secure hull openings on a roll-on roll-off passenger vessel</p>	<ul style="list-style-type: none"> a. Established procedures are properly applied for the opening, closing and securing of bow, stern and side doors and ramps and the operation of associated systems b. Appropriate checks are made to confirm the watertight integrity of the vessel prior to departure c. Problems with the operation of bow, stern and side doors and ramps and associated systems are promptly reported in accordance with established procedures d. Surveys on the proper sealing of hull openings on the vessel are conducted in accordance with established procedures and regulatory requirements
<p>4. Complete cargo handling and passenger embarkation / disembarkation documentation</p>	<ul style="list-style-type: none"> a. Correct reports are completed relating to cargo and vehicle loading / unloading and passenger embarkation / disembarkation operations and incidents in accordance with established procedures and regulatory requirements b. All documentation is completed in accordance with requirements and regulations

Range Of Variables

MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW 95 Code and Convention, ISM Code, roll-on roll-off vessel safety guides and port regulations related to roll-on roll-off vessel operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of operational and supervisory principles and procedures, safety precautions and hazard minimisation strategies to the management of the loading / unloading, vessel stability and the embarkation / disembarkation of passengers on a roll-on roll-off vessel. Contribution to the development of a broad plan for cargo handling, vessel stability and the embarkation / disembarkation of passengers is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the loading / unloading, and embarkation / disembarkation of passengers on a roll-on roll-off vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international roll-on roll-off passenger and vehicular transport vessel b. Loading / unloading, and embarkation/disembarkation of passengers on a roll-on roll-off vessel may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal situations b.2. under any possible operational conditions c. Types of cargo may include: <ul style="list-style-type: none"> c.1. road vehicles including cars trucks, buses, etc. c.2. rail cars c.3. other forms of transport units c.4. containers on transport units c.5. general cargo c.6. dangerous goods d. Measures to control the trim and stability of the vessel may include: <ul style="list-style-type: none"> d.1. adjusting weight distribution of load d.2. pumping ballast water to compensate for load distribution d.3. pumping of flooded compartments d.4. implementing damage control measures to maximise watertight integrity of hull where it has been damaged e. Cargo handling hazards may include: <ul style="list-style-type: none"> e.1. faulty cargo handling equipment e.2. damaged cargo e.3. cargo handling operations in poor weather or sea conditions e.4. incorrectly stowed dangerous cargo e.5. incorrectly stowed cargo e.6. poor ventilation on vehicle decks e.7. incorrectly lashed or secured cargo/vehicles, rail cars or other transport units e.8. incorrect procedures for opening, closing and securing the hull openings of the vessel e.9. using equipment beyond safe working limits e.10. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. established vehicle loading/discharging procedures a.4. established passenger embarkation/disembarkation procedures a.5. passenger lists a.6. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to roll-on roll-off vessels a.7. 'Trim and Stability Booklet' a.8. material data safety sheets a.9. IMDG Code a.10. vessel manufacturer's instructions and recommended procedures a.11. OHS procedures relevant to roll-on roll-off vessels a.12. instructions of relevant Maritime Authorities concerning the operation of roll-on roll-off vessels a.13. relevant Australian and international standards

Range Of Variables (continued)

MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include: a.1. sections of the IMO STCW 95 Code and Convention related to roll-on roll-off vessels a.2. relevant sections of AMSA Marine Orders a.3. IMDG Code a.4. Code of Practice for Cargo Stowage and Securing a.5. MARPOL Convention a.6. SOLAS Convention a.7. instructions of relevant Maritime Authorities concerning the operation of roll-on roll-off vessels a.8. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan the loading / unloading, and stability of a roll-on roll-off vessel a.2. Manage the cargo loading / unloading and passenger embarkation / disembarkation procedures on a roll-on roll-off vessel a.3. Ensure the correct opening, closing and securing of hull openings on a roll-on roll-off passenger vessel a.4. Complete cargo handling and passenger embarkation / disembarkation documentation a.5. Identify typical problems that may occur during cargo loading / unloading and passenger embarkation / disembarkation and take appropriate action a.6. Apply relevant international conventions, IMO and national codes, ro ro vessel operations guides and port regulations related to ro ro vessel operations a.7. Communicate effectively with others during cargo handling and passenger embarkation / disembarkation operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other competency units that form part of a job role of the master of a roll-on roll-off vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for roll-on roll-off vessels b. Relevant OH&S and pollution control legislation and policies c. Procedures and regulatory requirements for cargo loading / unloading and passenger embarkation / disembarkation on roll-on roll-off vessels, including: <ul style="list-style-type: none"> c.1. cargo loading and discharging preparations and procedures c.2. the use of cargo check lists and passenger lists, including the vessel/shore checklist. c.3. regulations and procedures for the control of entry into confined spaces c.4. proper ballasting and de-ballasting procedures c.5. emergency procedures d. Maritime communication techniques as they are applied in cargo / vehicle handling and passenger embarkation / disembarkation procedures on a roll-on roll-off passenger vessel e. Cargo handling systems and equipment and the procedures for their use f. The basic principles and trends in vessel design and the cargo handling systems on roll-on roll-off vessels, including: <ul style="list-style-type: none"> f.1. typical deck arrangements f.2. an understanding of freeboard and bulkhead deck, vehicle decks, passenger spaces, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead f.3. arrangements for the opening, closing and securing of bow, stern and side doors and ramps and associated systems f.4. factors that affect the stability, trim and stress on a roll-on roll-off vessel f.5. ventilation and atmosphere control systems f.6. arrangements for setting up and stowing retractable vehicle decks g. Properties and application of materials used in the construction of roll-on roll-off vessels h. The characteristics of dangerous cargoes, including: <ul style="list-style-type: none"> h.1. the physical characteristics of various types of dangerous cargo h.2. handling precautions and stowing procedures for classes of dangerous cargo as per IMDG Code and materials data safety sheets h.3. the practical significance of flashpoint, flammable range and auto-ignition temperature for various classes of dangerous cargo i. Principles and procedures for emergency operations on roll-on roll-off vessel, including: <ul style="list-style-type: none"> i.1. the importance of developing emergency plans i.2. techniques for emergency shutdown of cargo operations i.3. actions to be taken in the event of failure of services essential to the well-being of passengers and cargo i.4. actions to be taken following a collision or grounding i.5. the correct procedures for the use of personal protection clothing and equipment and lifesaving appliances i.6. the procedures for entry into and effecting a rescue from enclosed spaces

Evidence Guide (continued)

MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> j. Theory and calculations of vessel stability and dynamics including: <ul style="list-style-type: none"> j.1. computation of hydrostatic stability data of a ship j.2. calculation of a ship's centre of gravity, centre of buoyancy and metacentre j.3. calculation of the transverse and longitudinal stability using hydrostatic data j.4. calculation of the moment of statical stability at small angles of heel j.5. determination of the centre of gravity of a ship using an inclining experiment and effect of suspended weights j.6. determining the required correction for the height of centre of gravity (kg) for the free surface effect j.7. determination of the values of the righting lever and construction of righting lever curves j.8. Calculations for change of draught, trim and heel when entering different water densities and due to bilging of compartments. j.9. changes to draught, trim and heel due to adding or removing fuel, ballast or cargo j.10. displacement, wetted surface, form coefficients, tonne per centimetre immersion, application of Simpson's rules to first and second moments of area, centroids and centres of pressure. k. Potential problems related to the control of trim and stability for roll-on roll-off vessels and appropriate action and solutions, including: <ul style="list-style-type: none"> k.1. free surface of a liquid k.2. shift of cargo k.3. wind heel k.4. handling of heavy weights k.5. excessive trim k.6. large swell conditions k.7. dry docking k.8. grounding l. Principles of synchronous rolling and methods for its control, including an understanding of the effect on the rolling period of a vessel due to the radius of gyration m. Causes and repercussions of a heeling vessel n. Mandatory knowledge and skills in personal survival techniques, fire fighting and fire prevention required of all seafarers, as per Section A VI/1 of the IMO STCW 95 Code
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to manage cargo / vehicle handling and passenger embarkation / disembarkation procedures on a roll-on roll-off passenger vessel, and/or b. manage cargo / vehicle handling and passenger embarkation / disembarkation procedures on a roll-on roll-off passenger vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning the loading / unloading, and stability of a roll-on roll-off passenger vessel a.2 managing the loading / unloading and embarkation /disembarkation procedures on a roll-on roll-off passenger vessel a.3 confirming the correct opening, closing and securing of the hull openings a.4 identifying and evaluating cargo / vehicle handling and passenger embarkation / disembarkation problems and determining appropriate courses of action a.5 identifying and implementing improvements in cargo / vehicle handling and passenger embarkation / disembarkation procedures a.6 applying safety and hazard control precautions relevant to cargo / vehicle handling and passenger embarkation / disembarkation operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on cargo / vehicle handling and passenger embarkation / disembarkation on a roll-on roll-off passenger vessel b.4 relevant manufacturer's guidelines relating to the use of cargo handling plant and equipment, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes b.6 pollution management processes c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB1 01A PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to perform routine remedial, preventative and survey deck maintenance on commercial vessels. This includes carrying out basic deck maintenance, cleaning tasks, marine painting and checks on deck machinery and systems.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Perform basic deck maintenance</p>	<ul style="list-style-type: none"> a. Checks of deck surfaces are carried out in accordance with planned maintenance system b. Any deterioration or corrosion of a vessel's deck surfaces is identified and appropriate maintenance action initiated or carried out in accordance with planned maintenance system c. Minor faults and imperfections in painted surfaces are repaired in accordance with procedures d. Weathered surfaces are restored using cleaners and liquid abrasives in accordance with OH&S and pollution control requirements, planned maintenance procedures and manufacturer's instructions e. Tools and equipment are correctly identified and used in accordance with OH&S requirements, company procedures and equipment manufacturer's instructions f. Marine surfaces are prepared for the application of the required marine coating g. Maintenance materials are obtained, handled, prepared and applied in accordance with OH&S and pollution control requirements, company procedures and manufacturer's instructions h. Records of maintenance work carried out are completed in accordance with procedures
<p>2. Carry out cleaning activities</p>	<ul style="list-style-type: none"> a. Appropriate chemicals, cleaning agents and equipment are selected to clean an assigned area of the vessel b. Manufacturer's warning and instructions regarding the use of chemicals and cleaning agents are read, understood and applied c. Cleaning tasks are completed in the assigned area in accordance with procedures and manufacturer's instructions d. Chemicals, cleaning agents and equipment are correctly stored after use
<p>3. Select and apply appropriate paint systems for areas aboard a vessel</p>	<ul style="list-style-type: none"> a. Appropriate paints and painting equipment for a particular surface are selected in accordance with planned maintenance procedures and the paint manufacturer's instructions b. Marine paints are applied using appropriate application equipment in accordance with OH&S requirements, planned maintenance procedures and manufacturer's instructions c. Problems in the application of paints are identified and reported and/or appropriate remedial action initiated d. Debris from maintenance activities is disposed of, or stored, in accordance with established procedures e. Paint and painting equipment are correctly stored after use
<p>4. Check and perform basic maintenance on deck fittings, equipment and systems</p>	<ul style="list-style-type: none"> a. Tools and equipment for basic maintenance are correctly identified and used in accordance with OH&S requirements, planned maintenance procedures and equipment manufacturer's instructions b. Maintenance materials are obtained, handled, prepared and applied in accordance with OH&S and pollution control requirements, company procedures and manufacturer's instructions c. Defective deck fittings, equipment and systems are identified and reported, repaired and/or replaced as required by planned maintenance procedures d. Maintenance equipment is correctly cleaned and stored after use e. Debris and unused materials are disposed of or returned to store in accordance with OH&S and pollution control requirements, planned maintenance procedures and manufacturer's instructions

3. Follow safety and hazard control procedures

- a. Personal protection equipment (PPE) is used in accordance with regulations and OHS policy
- b. Maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, ship and the environment
- c. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times during maintenance and repair operations
- d. Where relevant, procedures and precautions necessary for entry, after authorisation by a responsible officer, into confined spaces on a vessel are correctly followed

Range Of Variables

PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations and instructions from the relevant deck/engineer officer. b. Work is performed within planned maintenance procedures, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality of maintenance outcomes.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Maintenance of a vessel may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. when berthed or moored b.3. when slipped or in dry dock c. Maintenance may include: <ul style="list-style-type: none"> c.1. identification of any deterioration of a deck areas, machinery and fittings c.2. cleaning of areas of the vessel c.3. repairs of minor faults and imperfections in painted surfaces c.4. identification of faulty equipment or fittings and arranging for repair or replacement c.5. restoration of weathered surfaces c.6. preparation of marine surfaces prior to the application of the prescribed marine coating c.7. selection and application of appropriate marine paints for particular surfaces d. Maintenance tools and equipment may include: <ul style="list-style-type: none"> d.1. hand tools including chipping hammers and scrapers d.2. electric power tools such as grinders, sanders and drills, d.3. pneumatic power tools such as grinders, sanders and drills d.4. marine preservative finish application equipment such as brushes, spay guns, rollers d.5. rinsing and storing equipment d.6. personal protection clothing and equipment such as: <ul style="list-style-type: none"> d.6.1. eye and ear protection d.6.2. safety boots d.6.3. dust and fume masks including various cartridges e. Deterioration of vessel's deck areas, machinery and fittings may include: <ul style="list-style-type: none"> e.1. corrosion to deck, fittings and equipment e.2. weathering of surfaces e.3. wearing of fittings and equipment
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. IMO STCW Convention and Code a.3. AMSA Marine Orders a.4. planned maintenance system a.5. maintenance records a.6. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.7. instructions, specifications and recommended procedures of manufacturers of maintenance tools and materials
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to the maintenance of vessels a.2. relevant sections of AMSA Marine Orders related to the maintenance of vessels a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Perform basic deck maintenance a.2. Carry out cleaning activities a.3. Select and apply appropriate paint systems for areas aboard a vessel a.4. Check and perform basic maintenance on deck fittings, equipment and systems a.5. Exercise all required safety, environmental and hazard control precautions and procedures during planned maintenance operations a.6. Communicate effectively with others when carrying out maintenance procedures onboard a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of an integrated rating.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant regulations b. ISM Code Safety Management System as it relates to planned vessel maintenance c. Relevant OH&S regulations and policies d. Procedures for the checking the deck areas, machinery and fittings of a vessel as part of planned routine maintenance procedures e. The nature and causes of corrosion of marine surfaces and structures and the available methods for its control f. Corrosion control measures including surface preparation and painting and antifouling g. Paints and painting equipment used in marine maintenance and the related procedures and precautions to be taken for preparation, application and storage h. Safety, environmental and hazard control precautions and procedures relevant to planned maintenance operations i. Procedures for the disposal of debris and waste during planned maintenance activities j. Storage principles of paints, chemicals and cleaning agents used in planned maintenance operations k. Procedures for the correct entry into a confined space onboard a vessel including OHS precautions, testing of unknown atmospheres, use of a confined space entry permit, and procedures as defined in the ISM Code Safety Management System l. Principle features of the structure of vessels m. A basic understanding of the properties and application of materials used in vessel construction n. Construction, layout and subdivision requirements of a typical vessel, including an understanding of freeboard and weather deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead o. Maritime communication techniques needed during slipping and maintenance operations p. Problems related to planned maintenance systems for deck areas, machinery and fittings and appropriate action and solutions q. Deck maintenance records that must be maintained on a vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out planned routine maintenance on deck areas, machinery and fittings onboard a vessel, and/or a.2. carry out planned routine maintenance on deck areas, machinery and fittings onboard a commercial or training vessel

Evidence Guide (continued)

PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. performing basic deck maintenance a.2. carrying out cleaning activities a.3. selecting and applying appropriate paint systems for areas aboard a vessel a.4. checking and performing basic maintenance on deck fittings, equipment and systems a.5. applying safety precautions relevant to planned routine maintenance operations <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant regulations b.2. OHS regulations and hazard prevention policies and procedures b.3. ISM Code Safety Management System b.4. job procedures and work instructions b.5. relevant vessel manufacturer's guidelines relating to planned routine maintenance procedures b.6. environmental protection procedures when carrying out maintenance operations <p>c. Action is taken promptly to report and/or rectify issues and problems identified during planned routine maintenance</p> <p>d. Work is completed systematically to the required standard</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	2

TDM MB4 01A MAINTAIN SEAWORTHINESS OF VESSEL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to maintain the seaworthiness of a commercial vessel, including action to preserve the watertight integrity of the vessel and to ensure that stability conditions comply with the intact stability criteria of the International Maritime Organisation under all conditions of loading.

The unit is consistent with the related functional standards in Section A III/1 and III/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Appendix 3

ELEMENT	PERFORMANCE CRITERIA
<p>1. Maintain watertight integrity of the vessel at all times</p>	<ul style="list-style-type: none"> a. Work to maintain seaworthiness of vessel is planned and carried out in accordance with company procedures and established safety rules and regulations b. Coverage and frequency of checks and inspections on the vessel's seaworthiness complies with the company procedures and established safety rules and MES and IMO regulations c. Repairs and corrosion control are initiated and coordinated in accordance with company procedures and vessel and equipment manufacturer's instructions d. Degree of vessel security is commensurate with anticipated weather and sea conditions and necessary vessel operations e. Action taken in anticipation of environmental changes is timely and appropriate to the change f. Precautions are taken to ensure that vessel and on-board powered equipment is operated in accordance with manufacturer's instructions and codes of safe working practice g. Action taken in emergency situations is appropriate to the significance of the situation and designed to maximise watertight integrity h. Instructions to officers, crew and others are clear, concise and made at an appropriate time and place i. Records on actions taken to carry out repairs and corrosion control and to ensure watertight integrity are complete, accurate and comply with statutory, commercial and enterprise requirements.
<p>2. Ensure the vessel's stress and stability for all stages of the voyage</p>	<ul style="list-style-type: none"> a. Stability calculations and weight distribution planning is conducted at a time, frequency and scope appropriate to the proposed nature of the voyage or operation b. Weight distribution is designed to maintain the vessel within acceptable stability and stress limits for all stages of the voyage c. Trim, draughts and list are adjusted as required to safely and efficiently progress all vessel operations d. 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 within acceptable limits at all times e. Action taken where weight distribution is compromising vessel safety, is prompt and designed to maximise safety f. Tests and checks using computer-based stability programs or other appropriate methods are conducted at a frequency and scope that conform to manufacturer's instructions g. Spurious or incorrect information from stress and stability calculations that is promptly recognised and recalculated h. Records of stress and stability calculations and action to maintain trim, stability and stress levels are maintained in accordance with company procedures and regulatory requirements

Range Of Variables

MAINTAIN SEAWORTHINESS OF VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW Conventions and Codes. b. Work is performed relatively independently within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of vessel construction principles and stability and stress techniques to the management of the seaworthiness of a vessel across a wide and often unpredictable variety of operational contexts. Monitoring and supervising the implementation of a broad plan or strategy for the maintenance of the seaworthiness of a vessel is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires limited responsibility in the management of the maintenance of the seaworthiness of a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Seaworthiness of a vessel must be maintained: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of sea, weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when bunkering b.7. when loading/unloading cargo c. Action taken to check the seaworthiness of a vessel may include: <ul style="list-style-type: none"> c.1. routine inspections c.2. checks prior to departure c.3. checks on completion of a voyage c.4. checks on completion of maintenance activities c.5. checks in anticipation of a change in sea and weather conditions c.6. checks during an emergency which may have caused damage or changes to the stability and stresses of the vessel d. Means of maintaining the security and stability of a vessel include: <ul style="list-style-type: none"> d.1. closing openings d.2. taking precautions when using lifting equipment and associated equipment d.3. position, stowage and lashing of cargo, stores and equipment d.4. action to avoid or minimise cargo shift during a voyage d.5. distribution of load on vessel d.6. ballast management d.7. measures to avoid corrosion and metal fatigue on the hull d.8. damage control measures to maintain, stabilise or restore the watertight integrity of the hull e. Maintenance may include: <ul style="list-style-type: none"> e.1. repairs to equipment, components and vessel's structure and appliances e.2. surface preparation and painting e.3. antifouling e.4. lubrication e.5. replacement of faulty equipment or components f. Stability and stress parameters may include: <ul style="list-style-type: none"> f.1. transverse stability – both dynamic and static f.2. longitudinal stability f.3. free surface effect f.4. torsion f.5. bending moments f.6. shear forces f.7. abnormal stability and stresses experienced in emergency and damage situations

Range Of Variables (continued)

MAINTAIN SEAWORTHINESS OF VESSEL

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. IMO Conventions and Class Rules a.4. AMSA Marine Orders a.5. 'Trim and Stability Booklet' a.6. company procedures a.7. maintenance schedules and records a.8. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.9. instructions of relevant Maritime Authorities related to the seaworthiness of vessels a.10. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO Conventions related to the seaworthiness of vessels a.2. ISM Code a.3. relevant sections of AMSA Marine Orders related to the seaworthiness of vessels a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MAINTAIN SEAWORTHINESS OF VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor and evaluate the seaworthiness of the vessel under normal and emergency situations a.2. Take appropriate action to maintain trim, stability and stresses of the vessel within safe limits a.3. Take appropriate preventative and remedial action to maintain the security and watertight integrity of the vessel's hull a.4. Initiate and coordinate maintenance, repair or replacement of faulty or damaged equipment or vessel's structure in accordance with company procedures and manufacturer's instructions a.5. Identify typical problems related to trim stability and stress of a vessel and the watertight integrity of the hull and take appropriate action in conjunction with other officers and crew a.6. Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations a.7. Communicate effectively with others when taking action to maintain the seaworthiness of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a navigational watch on a vessel of 500 gross tonnage or more, or officer in charge of an engineering watch on a vessel of 3,000kW propulsion power or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of the IMO STCW 95 Code and AMSA Marine Orders dealing with the seaworthiness of vessels b. ISM Code and associated ship's Safety Management System and procedures c. Relevant OH&S and pollution control legislation and policies d. Procedures for the checking and inspecting a vessel's seaworthiness to ensure compliance with the company procedures and established safety rules and regulations e. Principles and procedures to ensure the watertight integrity of a vessel's hull in both normal and emergency situations f. Damage control measures that may be required to maintain the integrity of the hull in a range of typical emergency situations that could occur on a vessel g. Procedures for the initiation and coordination of repair and/or replacement procedures h. Corrosion control measures including surface preparation and painting and antifouling i. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations j. Theory and calculations of vessel stability and dynamics including: <ul style="list-style-type: none"> j.1. computation of hydrostatic stability data of a vessel j.2. calculation of a vessel's metacentre j.3. calculation of the transverse and longitudinal stability using hydrostatic data j.4. calculation of the moment of statical stability at small angles of heel j.5. determination of the centre of gravity of a vessel using an inclining experiment j.6. determining the required correction for the height of centre of gravity for the free surface effect j.7. determination of the values of the righting lever and construction of righting lever curves j.8. calculations for change of draught and trim when entering different water densities k. Principle features of the structure of a vessel l. A basic understanding of the properties and application of materials used in vessel construction m. Construction, layout and subdivision requirements of a typical vessel, including and understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead n. Typical construction features and stress characteristics for vessels of 500 gross tonnage or more or 3,000 kW propulsion power or more o. The principal stresses which act on the structure of a vessel p. Effects of density of sea water on the draught and freeboard of a vessel q. Features of the load-line and draught marks of a vessel and methods for performing related calculations r. Maritime communication techniques needed s. Problems related to the control of trim, stability and stresses of vessels and appropriate action and solutions t. Records that must be maintained on the seaworthiness of a vessel

Evidence Guide (continued)

MAINTAIN SEAWORTHINESS OF VESSEL

4. Resource implications	<p>Access is required to opportunities to either:</p> <ol style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to maintain the seaworthiness of a vessel in a range of operational situations, and/or b. assist in maintaining the seaworthiness of a vessel in a range of operational situations either: <ol style="list-style-type: none"> b.1. using a simulator, meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of simulated loading and operational situations b.2. in appropriate practical situations on an operational commercial or training vessel possible operation of a vessel during seetime training
5. Consistency in performance	<ol style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ol style="list-style-type: none"> a.1 carrying out routine and emergency checks and inspections of a vessel's seaworthiness a.2 identifying and evaluating problems concerning the trim, heel, stability and stresses on a vessel and the integrity of its hull and determining an appropriate courses of action a.3 initiating and coordinating maintenance activities required to ensure the seaworthiness of a vessel a.4 applying safety precautions relevant to maintenance operations a.5 identifying and implementing improvements to procedures for maintaining the seaworthiness of a vessel b. Shows evidence of application of relevant workplace procedures including: <ol style="list-style-type: none"> b.1 relevant sections of IMO Conventions and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to the trim, stability and stress limits of the vessel b.5 procedures to protect the integrity and security of the vessel's hull b.6 environmental protection procedures when pumping ballast water c. Action taken promptly to report and/or rectify out-of-limit trim, stability and stresses of the vessel or problems with the integrity of the vessel's hull in accordance with manufacturer's instructions, statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ol style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ol style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ol style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MB5 01A MANAGE THE MAINTENANCE OF THE VESSEL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to manage the maintenance of a commercial vessel, including administration of a planned maintenance system, planning for docking and slipping of the vessel, following inspection and maintenance procedures, and selection and safe use of equipment and materials.

The unit is consistent with the section in the Australian USL Code dealing with competency requirements for a Master Class 3.

ELEMENT	PERFORMANCE CRITERIA
1. Administer a planned maintenance system	<ul style="list-style-type: none"> a. Plan for the routine preventative maintenance of a vessel is correctly interpreted and implemented b. Arrangements are made for maintenance activities to be carried out at the required times c. Repairs to vessel's hull or equipment and/o repair or replacement of equipment or components are organised in accordance with procedures
2. Docking and slipping of vessel	<ul style="list-style-type: none"> a. Type of slipway, dock or vessel lifting facility is identified and its suitability for the type of hull assessed b. Hull data is correctly interpreted and recorded c. Appropriate plan is prepared for procedures to be taken on-board vessel prior to, during and on completion of the proposed slipping or docking operations d. Cradle is correctly prepared prior to the slipping of the vessel e. Appropriate precautions are taken prior to slipping and refloating of the vessel and when shoring/supporting the vessel f. Vessel is correctly refloated after slipping and maintenance operations
3. Carry out inspection and maintenance procedures	<ul style="list-style-type: none"> a. Inspections of the vessel's hull, equipment and components are carried out in accordance with company maintenance schedules and vessel manufacturer's instructions b. Any deterioration of a vessel's structure and fittings is identified and appropriate maintenance action initiated c. Minor faults and imperfections in painted surfaces are repaired in accordance with company procedures d. Weathered surfaces are restored using cleaners and liquid abrasives in accordance with OH&S and pollution control requirements, company procedures and manufacturer's instructions e. Lubricants are applied to moving parts of vessel's equipment in accordance with OH&S and pollution control requirements, company maintenance schedules and manufacturer's instructions f. Marine surfaces are prepared for the application of the prescribed marine coating g. Appropriate preservatives or finishes for a particular surface are selected using the criteria specified in the manufacturer's instructions h. Marine preservatives or finishes are applied using appropriate application equipment in accordance with OH&S requirements, company procedures and manufacturer's instructions i. Problems in the application of marine preservatives and finishes and other maintenance materials and chemicals are identified and reported and/or appropriate remedial action initiated j. Records of maintenance work carried out are completed in accordance with company procedures

4. **Select and use maintenance equipment and materials**
 - a. Tools and equipment are correctly identified and used in accordance with OH&S requirements, company procedures and equipment manufacturer's instructions
 - b. Maintenance materials are obtained, handled, prepared and applied in accordance with manufacturer's instructions and OH&S and pollution control requirements
 - c. Defective equipment and materials are identified and reported, repaired and/or replaced as required
 - d. Maintenance equipment is correctly cleaned and stored after use
 - e. Unused materials are disposed of or returned to store in accordance with established procedures and manufacturer's instructions

Range Of Variables

MANAGE THE MAINTENANCE OF THE VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work requires limited responsibility for the management of the maintenance and slipping procedures onboard a vessel. c. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the conduct of routine maintenance procedures onboard vessel and the application of solutions to a defined range of unpredictable maintenance problems. Planning and administering the routine maintenance and slipping procedures for a vessel is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Maintenance of a vessel may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. when berthed or moored b.3. when slipped or in dry dock c. Maintenance may include: <ul style="list-style-type: none"> c.1. routine maintenance inspections c.2. identification of any deterioration of a vessel's structure and fittings c.3. repairs of minor faults and imperfections in painted surfaces c.4. identification of faulty equipment or fittings and arranging for repair or replacement c.5. restoration of weathered surfaces c.6. application of lubricants to moving parts of vessel's equipment c.7. preparation of marine surfaces prior to the application of the prescribed marine coating c.8. selection and application of appropriate marine preservatives or finishes for particular surfaces d. Maintenance tools and equipment may include: <ul style="list-style-type: none"> d.1. hand tools including chipping hammers and scrapers d.2. greasing and lubrication tools d.3. electric power tools such as grinders, sanders and drills, d.4. pneumatic power tools such as grinders, sanders and drills d.5. marine preservative finish application equipment such as brushes, spay guns, rollers d.6. rinsing and storing equipment d.7. protective clothing and equipment such as: <ul style="list-style-type: none"> d.7.1. eye and ear protection d.7.2. safety boots d.7.3. dust and fume masks e. Deterioration of vessel's structure and fittings may include: <ul style="list-style-type: none"> e.1. corrosion to hull fittings and equipment e.2. decay to timber surfaces e.3. osmosis and underwater blistering to painted and fibreglass finishes f. Slipping and docking may involve: <ul style="list-style-type: none"> f.1. patent slip f.2. mobile lift equipment (travel lift) f.3. lift platforms (hydraulic/cable) f.4. single point lifts (cranes) f.5. graving, floating and slave docks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. maintenance schedules and records a.3. company maintenance procedures a.4. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.5. instructions of relevant Maritime Authorities related to the maintenance of vessels
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW Code and Convention related to the seaworthiness of vessels a.2. relevant sections of AMSA Marine Orders (1997) related to the maintenance of vessels a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MANAGE THE MAINTENANCE OF THE VESSEL

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Administer and carry out routine maintenance procedures a.2. Carry out procedures to slip or dock a vessel in preparation for maintenance a.3. Initiate and coordinate maintenance, repair or replacement of faulty or damaged equipment or vessel's structure in accordance with company procedures and manufacturer's instructions a.4. Identify typical problems related to the maintenance of a vessel and take appropriate action in conjunction with other officers and crew a.5. Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations a.6. Communicate effectively with others when administering the maintenance procedures onboard a vessel
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a navigational watch.
3. Required knowledge and skills	a. Knowledge of sections of relevant maritime regulations b. Relevant OH&S and pollution control legislation and policies c. Procedures for the checking and inspecting a vessel as part of routine maintenance procedures to ensure compliance with the company requirements and established safety rules and regulations d. Procedures for the initiation and coordination of repair and/or replacement procedures on board vessels e. The nature and causes of corrosion of marine surfaces and structures and the available methods for its control f. Corrosion control measures, including surface preparation and painting and antifouling g. Preservatives and finishes used in marine maintenance and the related procedures and precautions to be taken for preparation, application and storage h. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations i. Principle features of the structure of a vessel j. A basic understanding of the properties and application of materials used in vessel construction k. Construction, layout and subdivision requirements of a typical vessel, including and understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead l. Slipping and docking procedures suitable for various types of hull forms m. Maritime communication techniques needed during slipping and maintenance operations n. Typical problems related to the slipping and maintenance of vessels and appropriate action and solutions o. Maintenance records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities

Evidence Guide (continued)

MANAGE THE MAINTENANCE OF THE VESSEL

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to administer maintenance on board a vessel, and/or b. administer maintenance procedures on an operational commercial or training vessel during seetime training
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 carrying out routine maintenance inspections a.2 identifying and evaluating maintenance problems and determining appropriate courses of action a.3 initiating and coordinating maintenance activities onboard a vessel a.4 applying safety precautions relevant to maintenance operations a.5 identifying and implementing improvements to routine maintenance procedures b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to routine maintenance procedures b.5 environmental protection procedures when carrying out maintenance operations c. Action is taken promptly to report and/or rectify maintenance problems d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	1	2	2

TDM MB6 01A MONITOR CONDITION AND SEAWORTHINESS OF A SMALL VESSEL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to monitor the condition and seaworthiness of a small commercial vessel, including an awareness of the fundamental principles of vessel construction, load line conditions of assignment, structural elements to restrain fires, design characteristics that contribute to watertight integrity and regulatory requirements for seaworthiness. It also includes the ability to identify structural components on drawings and on an actual vessel, and indications of any deterioration in the hull and fittings of a vessel.

The unit is consistent with the relevant sections in the Australian USL Code dealing with the competency requirements of a coxswain, Master (Class 4) and Master (Class 5).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Monitor the condition of the vessel</p>	<ul style="list-style-type: none"> a. Work to monitor condition and seaworthiness of the vessel is planned and carried out in accordance with procedures and safety regulations b. Coverage and frequency of checks and inspections on the vessel complies with the procedures c. Checks of the integrity of the vessel's hull are correctly carried out including the use of a testing tank where required d. Action taken in anticipation of environmental changes is timely and appropriate to the change e. Action taken in emergency situations is appropriate to the significance of the situation and ensures watertight integrity f. Precautions are taken to ensure that vessel and on-board powered equipment is operated in accordance with manufacturer's instructions and regulations
<p>2. Rectify identified problems with the condition of the vessel</p>	<ul style="list-style-type: none"> a. Any deterioration of the vessel's hull or structure is examined and reported and appropriate action is initiated to fix the identified problem b. Repairs and corrosion control are initiated and coordinated in accordance with procedures and manufacturer's instructions c. Communication with owners, officers, crew and others concerning the condition and seaworthiness of the vessel and related action is clear, concise and made at an appropriate time and place d. Records on problems identified and actions taken to carry out repairs and corrosion control and to ensure watertight integrity are complete, accurate and comply with requirements.

Range Of Variables

MONITOR CONDITION AND SEAWORTHINESS OF A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs in relation to specified quality standards and some responsibility for others. It involves the conduct of routine monitoring of the condition and seaworthiness of a vessel and the specification of solutions to a defined range of typical problems concerning deterioration of a vessel's hull, structure and equipment. Some discretion and judgement may be required in initiating action to report and rectify identified problems with the condition and seaworthiness of the vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small Australian commercial vessel b. Seaworthiness of a vessel must be maintained: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of sea, weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Action taken to monitor the condition and seaworthiness of a small vessel will depend on the limits of responsibility of the person concerned and may include: <ul style="list-style-type: none"> c.1. routine inspections c.2. checks prior to departure c.3. checks on completion of a voyage c.4. checks on completion of maintenance activities c.5. checks in anticipation of a change in sea and weather conditions c.6. use of testing tanks to check watertight integrity c.7. checks during an emergency which may have caused damage or changes to the seaworthiness of the vessel d. Repairs and maintenance procedures for a small vessel will depend on the limits of responsibility of the person concerned and may include: <ul style="list-style-type: none"> d.1. repairs to equipment, components, hull and vessel's structure d.2. surface preparation and painting d.3. antifouling d.4. lubrication d.5. replacement of faulty equipment or components
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant regulations a.2. procedures for monitoring of the condition and seaworthiness of vessel a.3. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.4. instructions of relevant Maritime Authorities related to the seaworthiness of vessels a.5. maintenance schedules and records
4. Applicable Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. sections of Australian USL Code related to the seaworthiness of vessels a.2. relevant Australian and State/Territory OH&S legislation

Evidence Guide

MONITOR CONDITION AND SEAWORTHINESS OF A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor and evaluate the condition and seaworthiness of a small vessel under normal and emergency situations a.2. Identify any deterioration of the vessel's hull, structure or equipment a.3. Take appropriate preventative and remedial action to maintain the security and watertight integrity of the vessel's hull a.4. Initiate and coordinate maintenance, repair or replacement of faulty or damaged equipment or vessel's structure in accordance with company procedures and manufacturer's instructions a.5. Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations a.6. Communicate effectively with others when taking action to maintain the seaworthiness of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a coxswain or a master on a small commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant regulations b. Relevant OH&S legislation and policies c. Procedures for the checking and inspecting a vessel's seaworthiness d. The principle stresses which act on the structure of a vessel e. Principles and procedures to ensure the watertight integrity of a vessel's hull in both normal and emergency situations f. Damage control measures that may be required to maintain the integrity of the hull in a range of typical emergency situations that could occur on a small vessel g. Procedures for the initiation and coordination of repair and/or replacement on board small vessels h. Corrosion control measures including surface preparation and painting and antifouling i. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations j. A basic understanding of the properties and application of materials used in vessel construction k. Construction, layout and subdivision requirements of various types of small vessels, including an understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments and the bulkhead of the vessel l. Records that must be maintained concerning the seaworthiness of a vessel m. The safe working limits of rigging and gear
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to monitor the condition and the seaworthiness of a small vessel in a range of operational situations, and/or b. assist in maintaining the seaworthiness of a vessel in a range of operational situations either: <ul style="list-style-type: none"> b.1. using a suitable simulator over an appropriate range of simulated loading and operational situations b.2. in appropriate practical situations on an operational commercial or training vessel possible operation of a vessel during training

Evidence Guide (continued)

MONITOR CONDITION AND SEAWORTHINESS OF A SMALL VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out routine and emergency monitoring of a vessel's seaworthiness a.2 identifying and evaluating problems concerning the condition of a vessel and the integrity of its hull and determining an appropriate courses of action a.3 initiating and coordinating any required repair or maintenance activities to ensure the seaworthiness of a vessel a.4 applying safety precautions relevant to monitoring, repair and maintenance operations <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to the seaworthiness the vessel b.5 procedures to protect the integrity and security of the vessel's hull <p>c. Action taken promptly to report and/or rectify problems with the seaworthiness of a vessel and the integrity of its hull</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MB7 01A SLIP VESSEL AND MAINTAIN HULL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to slip a commercial vessel of up to 24 metres in length and to carry out all required maintenance procedures to manage hull deterioration and the watertight integrity of the vessel. This includes carrying out slipping procedures, implementing safety procedures when vessel is out of the water, identifying deterioration of fittings and hull, checking the watertight integrity of the vessel, and initiating required remedial action to rectify identified damage or deterioration.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Master Class 5.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Docking and slipping of a small vessel</p>	<ul style="list-style-type: none"> a. Type of slipway, dock or vessel lifting facility is identified and its suitability for the type of hull assessed b. Hull data is correctly interpreted and recorded c. Appropriate plan is prepared for procedures to be taken on-board vessel prior to, during and on completion of the proposed slipping or docking operations d. Cradle is correctly prepared prior to the slipping of the vessel e. Appropriate precautions are taken prior to slipping and refloating of the vessel and when shoring/supporting the vessel f. Safety precautions for both personnel and the vessel are correctly implemented onboard when the vessel is out of the water g. Vessel is correctly refloated after slipping and maintenance operations
<p>2. Carry out inspection and maintenance procedures</p>	<ul style="list-style-type: none"> a. Checks of the vessel's hull, equipment and components are carried out in accordance with maintenance schedules and vessel manufacturer's instructions b. Any deterioration of a vessel's structure and fittings is identified and appropriate maintenance action initiated or carried out in accordance with company procedures and established nautical practice c. Minor faults and imperfections in painted surfaces are repaired in accordance with company procedures d. Weathered surfaces are restored using cleaners and liquid abrasives e. Lubricants are applied to moving parts of vessel's equipment in accordance with manufacturer's instructions f. Marine surfaces are prepared and the appropriate finish applied in accordance with the manufacturer's instructions g. Records of maintenance work carried out are completed in accordance with established procedures
<p>3. Maintain watertight integrity of a small vessel</p>	<ul style="list-style-type: none"> a. Checks on the watertight integrity of the vessel are carried out in accordance with company procedures and safety regulations b. Dangers to watertight integrity are identified and appropriate action is taken to report and rectify or minimise the hazards c. Repairs and corrosion control are initiated and carried out in accordance with company procedures and manufacturer's instructions d. Records of repairs and corrosion control and action to ensure watertight integrity are complete, accurate and comply with company procedures

4. **Select and use maintenance equipment and materials**
 - a. Tools and equipment are correctly identified, selected and used
 - b. Maintenance materials are obtained, handled, prepared and applied in accordance with established procedures and manufacturer's instructions
 - c. Defective equipment and materials are identified and reported, repaired and/or replaced as required by established procedures
 - d. Maintenance equipment is correctly cleaned and stored after use
 - e. Unused materials are disposed of or returned to store in accordance with OH&S and pollution control requirements and manufacturer's instructions

Range Of Variables

SLIP VESSEL AND MAINTAIN HULL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime requirements. b. Work is performed within defined operational procedures, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality of maintenance outcomes. It involves the organisation and conduct of specified maintenance procedures onboard the vessel and the application of solutions to a variety of predictable maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 24 metres in length b. Maintenance of a vessel may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. when berthed or moored b.3. when slipped or in dry dock c. Basic maintenance may include: <ul style="list-style-type: none"> c.1. routine inspections of the watertight integrity of the vessel c.2. identification of any deterioration of a vessel's hull, structure, fittings, propeller and underwater equipment c.3. cleaning and polishing c.4. checking and replacing sacrificial anodes d. Underwater equipment may include: <ul style="list-style-type: none"> d.1. sea valves and strainers d.2. bearings d.3. lock-pin d.4. skin fittings e. Maintenance tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools including chipping hammers and scrapers e.2. electric power tools such as grinders, sanders and drills, e.3. pneumatic power tools such as grinders, sanders and drills e.4. protective clothing and equipment such as: <ul style="list-style-type: none"> e.4.1. eye and ear protection e.4.2. safety boots and helmet e.4.3. dust and fume masks f. Deterioration of vessel's structure and fittings may include: <ul style="list-style-type: none"> f.1. corrosion to hull fittings and equipment f.2. decay of timber surfaces f.3. deterioration of propellers and underwater equipment g. Action to maintain watertight integrity of vessel may include: <ul style="list-style-type: none"> g.1. closing of sea valves g.2. repair of corrosion g.3. closing of hatches g.4. checks on hull fittings
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. planned maintenance procedures a.3. maintenance schedules and records a.4. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.5. instructions, specifications and recommended procedures of manufacturers of maintenance tools and materials a.6. instructions of relevant Maritime Authorities related to the maintenance of vessels
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code a.2. relevant Australian and State/Territory OH&S legislation

Evidence Guide

SLIP VESSEL AND MAINTAIN HULL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Organise and carry out routine maintenance and checks of water tight integrity of a vessel up to 24 metres in length a.2. Carry out procedures to slip or dock a vessel in preparation for inspections and maintenance a.3. Initiate and coordinate maintenance, repair or replacement of faulty or damaged equipment or vessel's structure a.4. Identify typical problems related to the maintenance of a vessel and take appropriate action a.5. Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations a.6. Communicate effectively with others when administering the maintenance procedures onboard a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master of a trading vessel up to 24 metres in length.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Procedures for the checking and inspecting a small vessel as part of routine maintenance procedures d. Procedures for the initiation and coordination of repair and/or replacement procedures on board small vessels e. The nature and causes of corrosion of marine surfaces and structures and the available methods for its control, including surface preparation and painting and antifouling f. Preservatives and finishes used in marine maintenance and the related procedures and precautions to be taken for preparation, application and storage g. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations h. Principle features of the structure of vessels up to 24 metres in length, including: <ul style="list-style-type: none"> h.1. a basic understanding of the properties and application of materials used in vessel construction h.2. the construction features, layout and subdivision requirements of a typical small vessel, including and understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments and the bulkhead of the vessel i. Slipping and docking procedures suitable for various types of hull forms used in vessels up to 24 metres in length j. Maritime communication techniques needed during slipping and maintenance operations k. Problems that may arise concerning the slipping and maintenance of vessels up to 24 metres in length and appropriate action and solutions l. Maintenance records that must be maintained on a small vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to slip a small vessel up to 24 metres in length carry out routine maintenance and operations to maintain the watertight integrity of the hull, and/or b. carry out procedures on an operational commercial or training vessel up to 24 metres in length to: <ul style="list-style-type: none"> b.1. slip and refloat the vessel b.2. undertake routine maintenance b.3. undertake operations to maintain the watertight integrity of the vessel

Evidence Guide (continued)

SLIP VESSEL AND MAINTAIN HULL

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 slipping and refloating a small vessel up to 24 metres in length a.2 carrying out routine maintenance a.3 checking and maintaining the watertight integrity of a small vessel up to 24 metres in length a.4 applying safety precautions relevant to slipping, refloating and maintenance operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to slipping and routine maintenance procedures b.5 environmental protection procedures when carrying out maintenance operations c. Action is taken promptly to report and/or rectify issues and problems identified with slipping and maintaining the vessel and when checking the integrity of the vessel's hull d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDT MB20 01A ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to assist the engineer in the routine maintenance of main propulsion and ancillary machinery and systems, including working as part of a team and under supervision on the basic maintenance of diesel engines, marine steam turbines, steam boilers, pumps, heat exchangers, fresh water generators, compressed air systems, steering systems, engine room safety systems, electrical systems, refrigeration systems and engine room systems. It includes assistance in the checking and keeping of some maintenance data records.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Assist in the routine maintenance of main and ancillary machinery and associated systems</p>	<ul style="list-style-type: none"> a. Assist the Engineer to perform planned basic routine maintenance of main propulsion and ancillary machinery and associated systems. b. Signs of malfunction in main propulsion and ancillary machinery and associated systems are reported to the engineer c. Maintenance tasks on the main propulsion and ancillary machinery and associated systems required of an integrated rating are completed under the supervision of the engineer d. Records of maintenance activities are completed as directed and in accordance with established practice
<p>2. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precautions and regulations are followed when working in engine-room and ancillary machinery and associated spaces b. Operational hazards are identified and action is taken in conjunction with the engineer and other team members to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces , after authorization by a responsible officer, on a vessel are correctly followed d. Understanding of the types of appropriate action that the Engineer may initiate in the event of a failure or emergency associated with main propulsion and ancillary machinery and associated systems to isolate and secure the plant and equipment and the vessel and maintain the safety of the vessel and persons involved so that the integrated rating can give assistance if required. e. Shipboard emergency and contingency plans are followed in the event of a failure or emergency associated with main propulsion and ancillary machinery and associated systems (including engineroom explosion/fire and hull-breach)

Range Of Variables

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in accordance with relevant regulations. b. Work is performed under the direction and supervision of the engineer, within defined practice and procedures with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the assistance to the engineer in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems on a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. The vessel may be any Australian or international commercial vessel of 3,000 kW propulsion power or more b. Assistance in the basic maintenance of the main propulsion and ancillary machinery and associated systems may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchored or moored b.6. while in dry dock c. Propulsion plant configurations may include: <ul style="list-style-type: none"> c.1. low speed, medium and high speed diesel propulsion c.2. stern tube bearing c.3. CPP c.4. direct drive shaft c.5. diesel electric c.6. steam turbine c.7. gas turbine c.8. reduction gears c.9. thrust blocks, detuners and shaft bearings d. main propulsion and ancillary machinery and associated systems may include: <ul style="list-style-type: none"> d.1. steam turbine, diesel, diesel electric and gas turbine propulsion systems and controls d.2. steam boilers d.3. steering gear, stabilizers, bow thrusters, rudders d.4. fluid power systems and controls d.5. pumps and pumping systems d.6. ancillary systems and controls, including <ul style="list-style-type: none"> d.6.1. fresh and salt water cooling systems d.6.2. lubricating oil cooling systems d.6.3. fuel, oil, gas, coal d.6.4. air starting d.6.5. lubrication d.6.6. onboard air compressors and compressed air and control air systems d.6.7. waste management and pollution control systems as per the MARPOL Convention d.6.8. sewage plant d.7. fixed fire fighting installations and fire control systems e. Emergencies may include: <ul style="list-style-type: none"> e.1. loss of propulsion e.2. loss of steerage e.3. flooding of engine room e.4. fire or explosion in engine room e.5. loss of refrigeration e.6. loss of water making ability e.7. fuel oil, lubrication oil, steam and gas leaks e.8. loss of electrical power e.9. pump failure e.10. overheating and overspeed of machinery, governors, emergency trips e.11. electric shock

Range Of Variables (continued)

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>f. Potential hazards during operation of main propulsion and ancillary machinery and associated systems may include:</p> <ul style="list-style-type: none"> f.1 operating equipment beyond safe working limits f.2 moving and rotating machinery f.3 working in confined spaces f.4 faulty machinery equipment handling equipment and lifting gear f.5 non-compliance with safe working procedures f.6 hot pipes and valves (steam, fuel oil, lubricating oil) f.7 cold pipes and valves (refrigeration and liquefied gas cargoes) f.8 flammable liquids, vapours and fuel f.9 working at heights f.10 moving heavy loads using unsafe lifting procedures f.11 unsecured machinery, components or equipment f.12 slippery deck f.13 poor housekeeping procedures f.14 sharp tools and implements f.15 power tools f.16 dangerous atmosphere f.17 overspeed of electrical machinery, emergency trips f.18 noxious and dangerous cargoes f.19 machinery overload
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. planned maintenance systems, procedures and engineer's instructions a.3. running sheets, operations logs and other records a.4. computer database of running information a.5. vessel's survey procedures and instructions as they relate to the main propulsion and ancillary machinery and associated systems a.6. vessel's safety and emergency contingency plans and procedures a.7. relevant sections of national and international regulations, IMO Conventions and Codes
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules related to the main propulsion and ancillary machinery and associated systems on vessels of 3,000 kW propulsion power or more a.2. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Assist the engineer in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems a.2. Identify and report to the engineer signs of malfunction in the main and ancillary machinery and associated systems a.3. Exercise all required safety, environmental and hazard control precautions and procedures when assisting in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems a.4. Communicate effectively with the engineer and other team members others during maintenance activities
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory competency units that form part of a job role of an integrated rating.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S and pollution control legislation and policies c. Procedures required of an integrated rating if assisting the Engineer in the performance of inspections, maintenance and data recording on main propulsion and ancillary machinery and systems, including: <ul style="list-style-type: none"> c.1. parameters to be measured and recorded c.2. the types of machinery faults that should be recognised by an integrated rating c.3. procedures for soot blowing boiler tubes c.4. procedures for draining scavenge spaces c.5. procedures for assisting the engineer, if required, in the warming through and shut down of a marine diesel engine plant c.6. procedures for the preparation of tools and equipment used in maintenance operations c.7. procedures for the cleaning of propulsion and ancillary machinery (as required of an integrated rating) c.8. procedures for identifying and rectifying basic faults in a lifeboat engine c.9. procedures for the warming through of a steam line and the prevention of water hammer c.10. procedures for the lubrication of machinery (as required of an integrated rating) c.11. procedures on domestic piping/pumping systems (as required of an integrated rating) c.12. procedures for assisting the engineer in the isolation of systems for maintenance activities d. A basic understanding of the operational characteristics and normal performance of the main and ancillary machinery and associated control systems e. Typical hazards and problems that can occur in the engine-room at any time as well as during the maintenance of main and ancillary machinery and associated systems. f. Elementary principles of diesel engine basic maintenance, including: <ul style="list-style-type: none"> f.1. the operating cycles and types of diesel engines f.2. the major components of marine diesel engines and their functions f.3. the maintenance 'running-sheets' to be recorded by an integrated rating f.4. basic maintenance on diesel engines to be conducted by an integrated rating under the supervision of an engineer g. Elementary principles of marine steam turbine basic maintenance, including: <ul style="list-style-type: none"> g.1. steam flow through a typical marine turbine g.2. the major components of marine steam turbines and their functions g.3. the maintenance 'running-sheets' to be recorded by an integrated rating g.4. basic maintenance on marine steam turbines to be conducted by an integrated rating under the supervision of an engineer

Evidence Guide (continued)

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> h. Elementary principles of marine steam boiler basic maintenance, including: <ul style="list-style-type: none"> h.1. the uses of steam on board a vessel h.2. the methods of generating steam on board a vessel h.3. the features, elements, functions and applications of low, medium and high pressure boilers h.4. basic maintenance on marine steam boilers to be conducted by an integrated rating under the supervision of an engineer i. Elementary principles of marine shafting systems and their basic maintenance, including: <ul style="list-style-type: none"> i.1. propeller types i.2. the features and functions of thrust blocks, intermediate bearings, gear box and stern tube i.3. the methods of achieving astern motion on a vessel i.4. basic maintenance on marine shafting systems to be conducted by an integrated rating under the supervision of an engineer j. Elementary principles and functions of marine ancillary systems and their basic maintenance, including: <ul style="list-style-type: none"> j.1. various valve and pump types commonly encountered on vessels and their functions j.2. various types of heat exchangers commonly encountered on vessels and their functions j.3. fresh water generators j.4. pollution control and waste handling equipment j.5. steering mechanisms j.6. electrical distributions systems including an awareness of the license restrictions of the statutory electrical authorities j.7. refrigeration systems j.8. centrifuge purifiers j.9. sea water systems j.10. fresh water cooling systems j.11. lubricating oil systems j.12. fuel oil systems j.13. compressed air system j.14. seed water system j.15. steam / condensate system k. Manufacturer's warnings and instructions concerning the handling and use of chemicals and cleansing agents l. Procedures for the use of personal protection clothing and equipment (PPE) m. Procedures and precautions for entering, after authorization by a responsible officer, confined spaces on a vessel n. Freezer space and engine-room escape procedures o. Dangers associated with compressed air and high pressure fluids and related precautions p. Hazards and dangers associate with electricity and related precautions q. Dangers associated with lubricating operating steering mechanisms and related precautions r. Operational and maintenance records that must be maintained on a vessel s. Knowledge and ability to read and interpret material safety data sheets t. Maritime communication techniques needed during the maintenance of main propulsion and ancillary machinery and associated systems
<p>3. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to assist the engineer in the planned routine maintenance of the main propulsion and ancillary machinery and associated systems on a vessel; and/or b. assist the engineer in the planned routine maintenance of the main propulsion and ancillary machinery and associated systems on a commercial or training vessel of 3,000 kW propulsion power or more

Evidence Guide (continued)

ASSIST ENGINEER IN THE ROUTINE MAINTENANCE OF MAIN PROPULSION AND ANCILLARY MACHINERY AND SYSTEMS

4. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. assisting the engineer in the planned basic routine maintenance of the main propulsion and ancillary machinery and associated systems a.2. applying safety precautions relevant to the main propulsion and ancillary machinery and associated system a.3. completing documentation and records as directed b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. OHS regulations pollution control and hazard prevention regulations and policies b.3. ISM Code safety management system procedures, quality procedures and work instructions b.4. following on-board housekeeping processes c. Action taken promptly to report signs of malfunctions in main and ancillary machinery and associated systems in accordance with regulations, shipboard procedures and the ISM Code d. Work is completed systematically to required standard
5. Context for assessment	<ul style="list-style-type: none"> a. Assessment of this unit must include approved arrangements for the assessment of knowledge and practical competence b. Assessment of knowledge and competence may occur: <ul style="list-style-type: none"> b.1. at a recognised maritime training institution, and/or b.2. concurrently with practical assessment <ul style="list-style-type: none"> b.2.1. at a recognised maritime training institution through practical exercises and case studies that suitably-simulate the operation of main and ancillary machinery, and/or associated systems, and/or b.2.2. during seetime on a working or training vessel of 3,000 kW propulsion power or more c. Approved practical assessment may occur: <ul style="list-style-type: none"> c.1.1. at a recognised maritime training institution through practical exercises and case studies that suitably-simulate the operation of main and ancillary machinery, and/or associated systems, and/or c.1.2. during seetime on a working or training vessel of 3,000kW propulsion power or more d. Assessment of competence must comply with the relevant regulatory requirements.

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	2	1	1	1

TDM MC1 01A MANOEUVRE AND HANDLE A VESSEL OF 500 GROSS TONNAGE OR MORE UNDER ALL CONDITIONS

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to manoeuvre a commercial vessel of 500 gross tonnage or more under all possible weather and operational conditions, including berthing, mooring and anchoring operations and manoeuvring during an emergency.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
1. Manoeuvre the vessel for required operations in normal conditions	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operation and keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, weather, tide, headreach and stopping distances c. Alterations of heading or power are smooth and controlled at all times d. Communication is clear, concise and acknowledged at all times according to good seamanship e. Suitable mode of steering is selected for the manoeuvre with respect to the area, wind and sea conditions f. Constant rate of turn techniques are used to achieve constant radius turns during manoeuvres g. Vessel propulsion is controlled as required to progress the operation and complement helm movements h. Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvres i. Adequate resources are organised prior to and during operations
2. Manoeuvre vessel with the assistance of tugs	<ul style="list-style-type: none"> a. Manoeuvres with the assistance of tugs are carried out to control vessel's speed, attitude and direction when required b. Precautions are taken during manoeuvres to minimise interaction effects and other hazards when working with tugs during manoeuvres c. Communication with tugs is maintained throughout manoeuvres
3. Handle vessel when under way	<ul style="list-style-type: none"> a. The effects on vessel performance of shallow and restricted waters, ice, banks, tidal conditions and passing vessel's and own vessel's bow and stern waves are regularly evaluated and the implications for vessel handling assessed b. Appropriate alterations to vessel heading and power are made in response to assessments of the vessel's operational environment
4. Manoeuvre vessel during adverse weather conditions	<ul style="list-style-type: none"> a. Impending adverse weather and/or ice conditions are identified and the implications for vessel operations are evaluated b. Preparations are made and required precautions are taken to minimise risk and damage to vessel and personnel and time loss on passage c. Manoeuvres are adjusted to allow for weather and sea conditions to safely progress the operation and keep the vessel in safe water d. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre and the prevailing weather and sea conditions e. Special handling techniques required under heavy weather conditions are used when necessary

5. **Manoeuvre the vessel during emergencies**
- a. Manoeuvres are made to safely progress the operations during the emergency and to keep the vessel in safe water
 - b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, the nature of the emergency and the existing sea and weather conditions
 - c. Risks to the vessel and the safety of persons on board are assessed during the emergency and appropriate risk minimisation strategies are developed and applied
 - d. Alterations of heading or power are smooth and controlled at all times and are appropriate to the emergency situation
 - e. Communication during the emergency is clear, concise and acknowledged at all times

Range Of Variables

MANOEUVRE AND HANDLE A VESSEL OF 500 GROSS TONNAGE OR MORE UNDER ALL CONDITIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental nautical principles and complex manoeuvring techniques across a wide and often unpredictable variety of operational contexts. Contribution to the development of a broad plan, budget or strategy for vessel operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to manoeuvring operations and procedures for vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Manoeuvres may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Manoeuvres may include: <ul style="list-style-type: none"> c.1. berthing and unberthing c.2. mooring or anchoring c.3. approaching pilot stations and embarking and disembarking pilots c.4. handling vessel in shallow water, rivers, estuaries and restricted waters c.5. navigating in or near ice or in conditions of ice accumulation on board c.6. navigating in and near 'traffic separation schemes' and 'vessel traffic service areas' c.7. interactions with tugs c.8. use of propulsion and manoeuvring systems c.9. dragging an anchor and clearing a foul anchor c.10. dry docking both with and without damage d. Emergencies may include: <ul style="list-style-type: none"> d.1. loss of rudder d.2. loss of propeller d.3. when hove to d.4. fire or flooding on board a vessel. e. Special handling techniques required in heavy weather may include: <ul style="list-style-type: none"> e.1. assisting a vessel or aircraft in distress e.2. towing operations e.3. launching rescue boats and survival craft e.4. taking on board survivors from rescue boats and survival craft e.5. keeping an unmanageable vessel out of the trough of the sea e.6. lessening drift
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW Convention and Code a.5. AMSA Marine Orders a.6. IMO SOLAS Convention a.7. vessel's log a.8. company procedures a.9. vessel manufacturer's instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. pilot instructions where relevant a.12. relevant Australian and international standards

Range Of Variables (continued)

MANOEUVRE AND HANDLE A VESSEL OF 500 GROSS TONNAGE OR MORE UNDER ALL CONDITIONS

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. IMO STCW Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. IMO SOLAS Convention a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MANOEUVRE AND HANDLE A VESSEL OF 500 GROSS TONNAGE OR MORE UNDER ALL CONDITIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manoeuvre the vessel <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. with the assistance of tugs a.1.4. when underway a.1.5. in berthing and unberthing operations a.1.6. when anchoring or mooring a.2. Exercise all required safety and hazard control procedures when manoeuvring the vessel a.3. Identify typical manoeuvring problems and take appropriate action a.4. Communicate effectively with others during manoeuvring operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Convention and Codes and AMSA Marine Orders applicable for vessels of 500 gross tonnage and over b. Relevant OH&S legislation, codes of practice, policies and procedures c. IMO SOLAS Convention d. Methods for controlling vessel speed and direction e. Procedures for picking up and dropping off a pilot f. Procedures for working with tugs and tractors g. Techniques used for anchoring a vessel h. Procedures for preparing for and manoeuvring a vessel in adverse weather conditions i. Constant rate of turn techniques j. Effects on vessel handling of wind, currents and bottom topography k. Typical manoeuvring and engine characteristics for vessels of 500 gross tonnage or more, including stopping distances and turning circles at various draughts, speeds and loading l. Procedures for the use of manoeuvring data sheets m. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' n. Typical manoeuvring problems for vessels of 500 gross tonnage or more and appropriate action and solutions o. Maritime communication techniques, including issuing of helm and engine orders and tug communications
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. operate a vessel simulator, meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of simulated manoeuvring situations, weather and loading conditions b. manoeuvre a commercial vessel of 500 gross tonnage or more in an appropriate range of situations, weather and loading conditions; and/or

Evidence Guide (continued)

MANOEVRE AND HANDLE A VESSEL OF 500 GROSS TONNAGE OR MORE UNDER ALL CONDITIONS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 completing manoeuvring operations a.2 identifying and evaluating manoeuvring problems and determining an appropriate courses of action a.3 identifying and implementing improvements to manoeuvring procedures a.4 applying safety precautions relevant to manoeuvring operations a.5 assessing operational capability of vessel and manoeuvring plant and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 Relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations <p>c. Action taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MC2 01A OPERATE REMOTE CONTROLS OF PROPULSION PLANT AND ENGINEERING SYSTEMS AND PROCEDURES

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to remotely operate shipboard plant, propulsion systems, auxiliary machinery and equipment in accordance with technical specifications and within safe operating limits at all times.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate remote controls of propulsion plant and engineering systems and services</p>	<p>a. Remote controls of propulsion plant, other engineering systems and auxiliary machinery are operated in accordance with company procedures and manufacturer's instructions</p> <p>b. Communication with engine room is clear, concise and acknowledged at all times during a voyage</p> <p>c. Performance of propulsion plant, other engineering systems and auxiliary machinery and equipment is monitored and evaluated using remote performance indicators</p> <p>d. Appropriate corrective action is taken in conjunction with the Chief Engineer when performance of propulsion plant or other engineering systems is found to be unsatisfactory or outside of specified limits</p> <p>e. The relationship between speed and fuel consumption is monitored and action taken as required in accordance with operational instructions</p> <p>f. Safety and hazard minimisation procedures and regulations related to the control of propulsion plant, other engineering systems and auxiliary machinery are followed at all times to maintain the safety of personnel, propulsion and engineering systems, cargo and the vessel</p>
<p>2. Coordinate deck and engine-room resources</p>	<p>a. Coordination of deck and engine room operations and resources is maintained during the daily operation of the vessel</p> <p>b. Responses are coordinated and appropriate action is taken in the event of any breakdown in the remote control systems for propulsion plant, other engineering systems and auxiliary machinery</p> <p>c. Correct log book entries are made relating to equipment operations and incidents during a voyage</p>
<p>3. Manage emergency situations involving the use of remote controls</p>	<p>a. Remote controls of relevant emergency systems and auxiliary machinery and equipment are correctly operated in the event of a shipboard emergency</p> <p>b. Communication is clear, concise and acknowledged at all times during emergency situations</p>

Range Of Variables

OPERATE REMOTE CONTROLS OF PROPULSION PLANT AND ENGINEERING SYSTEMS AND PROCEDURES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental engineering principles and equipment control techniques across a wide and often unpredictable variety of operational contexts. Contribution to the development of a broad plan or strategy for shipboard engineering operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to equipment control operations and procedures for vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Remote control of engineering systems may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Engineering plant and systems that may be remotely controlled or monitored include: <ul style="list-style-type: none"> c.1. propulsion systems and controls c.2. electrical systems and controls c.3. engineering plant performance indicators c.4. indicators of speed and fuel consumption c.5. steering gear c.6. hydraulic systems and controls c.7. pumps and pumping systems c.8. bridge controls and UMS (Unattended Machinery Spaces) systems c.9. auxiliary systems and controls d. Propulsion plant configurations may include: <ul style="list-style-type: none"> d.1. CPP d.2. direct drive shaft d.3. electric diesel d.4. steam d.5. reduction gear e. Auxiliary systems and controls may include: <ul style="list-style-type: none"> e.1. cooling water e.2. fuel e.3. air starting e.4. lubrication e.5. ballast water e.6. bilge e.7. waste management and pollution control systems as per the MARPOL Convention f. Emergencies may include: <ul style="list-style-type: none"> f.1. loss of propulsion f.2. loss of electrical power f.3. loss of steerage f.4. flooding of engine room f.5. fire or explosion in engine room

Range Of Variables (continued)

OPERATE REMOTE CONTROLS OF PROPULSION PLANT AND ENGINEERING SYSTEMS AND PROCEDURES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. MO STCW Convention and Code a.4. AMSA Marine Orders a.5. vessel's log a.6. company procedures for the remote control of propulsion plant and other engineering systems a.7. plant and equipment manufacturer's instructions and recommended procedures a.8. instructions of relevant Maritime Authorities a.9. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. relevant international, Australian and State/Territory OH&S legislation a.4. MARPOL Convention on waste management and control systems

Evidence Guide

OPERATE REMOTE CONTROLS OF PROPULSION PLANT AND ENGINEERING SYSTEMS AND PROCEDURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate the remote controls of a vessel <ul style="list-style-type: none"> a.1.1. safely in both normal and emergency situations a.1.2. in normal and adverse weather conditions a.1.3. when underway a.1.4. in berthing and unberthing operations a.1.5. when anchoring or mooring a.2. Monitor and evaluate the performance of vessel's propulsion plant, other engineering systems and auxiliary machinery and equipment using remote performance indicators a.3. Exercise all required safety and hazard control procedures when operating the remote controls of the vessel a.4. Identify typical problems when remotely controlling shipboard plant and equipment and take appropriate action in conjunction with the Chief Engineer a.5. Communicate effectively with engineering personnel others when remotely controlling shipboard plant and equipment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW Convention and Codes and AMSA Marine Orders applicable for vessels of 500 gross tonnage and over b. Relevant OH&S legislation, codes of practice, policies and procedures c. Methods for remotely controlling the operation of shipboard propulsion plant and other engineering systems including auxiliary machinery and equipment d. Typical characteristics of propulsion machinery and control systems for vessels of 500 gross tonnage or more, including operational limits, fuel consumption-speed relationships, stopping distances and turning circles at various draughts, speeds and loading e. Relationship between a vessel's speed and fuel consumption including the meaning of economical RPM and its application f. Procedures for the monitoring and evaluation the performance of propulsion plant, other engineering systems and auxiliary machinery and equipment g. Procedures and precautions for bunkering operations h. Dangers associated with shipboard electrical plants and related hazard prevention strategies i. Sequence of required action when electrical system becomes overloaded j. Basic principles of operation and functions of various systems and controls including: <ul style="list-style-type: none"> j.1. pumps and pumping systems j.2. various shipboard emergency systems j.3. hydraulic systems and controls j.4. bridge located engine controls j.5. various auxiliary systems and controls such as cooling water, fuels system, air starting and lubrication system, an ballast water and bilge system k. Requirements for waste management and control systems under the MARPOL Convention l. Procedures for the coordination of deck and engineering resources m. Bridge communication techniques, including issuing of engine room orders n. Typical problems with the remote control of propulsion plant, other engineering systems and auxiliary machinery and equipment, for vessels of 500 gross tonnage or more and appropriate preventative and remedial action and solutions
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. remotely control the propulsion plant and auxiliary equipment of a vessel of 500 gross tonnage or more in an appropriate range of situations, weather and loading conditions; and/or a.2. operate an integrated vessel simulator, meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of simulated normal and emergency propulsion and engineering control situations

Evidence Guide (continued)

OPERATE REMOTE CONTROLS OF PROPULSION PLANT AND ENGINEERING SYSTEMS AND PROCEDURES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 completing propulsion and engineering control operations a.2 identifying and evaluating engineering control problems and determining an appropriate courses of action a.3 identifying and implementing improvements to engineering control procedures a.4 applying safety precautions relevant to engineering control operations a.5 assessing operational capability and performance of propulsion and other engineering plant and auxiliary equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 Relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment performance, capability and limitations b.6 quality procedures (where existing) b.7 security procedures b.8 following on-board housekeeping processes b.9 waste, pollution and recycling management processes and systems <p>c. Action taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MC3 01A MANOEUVRE AND HANDLE THE VESSEL IN NORMAL CONDITIONS

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to manoeuvre a commercial vessel during normal operations, including berthing, mooring and anchoring.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manoeuvre the vessel for normal operations</p>	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operation and keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, weather, tide, headreach and stopping distances c. Alterations of heading or power are smooth and controlled at all times d. Communication is clear, concise and acknowledged at all times according to good seamanship e. Suitable mode of steering is selected for the manoeuvre with respect to the area, wind and sea conditions f. Constant rate of turn techniques are used to achieve constant radius turns during manoeuvres g. Vessel propulsion is controlled as required to progress the operation and complement helm movements h. Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvres i. Anchoring and berthing operations are coordinated and supervised in accordance with established procedures j. Appropriate inter-vessel communications are correctly used during vessel manoeuvres k. Adequate resources are organised prior to and during operations
<p>2. Handle vessel when under way</p>	<ul style="list-style-type: none"> a. The effects on vessel performance of shallow and restricted waters, ice, banks, tidal conditions and passing vessel's and own vessel's bow and stern waves are regularly evaluated and the implications for vessel handling assessed b. Appropriate alterations to vessel heading and power are made in response to assessments of the vessel's operational environment c. Special handling techniques are correctly applied during rescues or adverse sea and weather conditions
<p>3. Manoeuvre vessel during adverse weather conditions</p>	<ul style="list-style-type: none"> a. Impending adverse weather and/or ice conditions are identified and the implications for vessel operations are evaluated b. Preparations are made and required precautions are taken to minimise risk and damage to vessel and personnel and time loss on passage within the limits of the officer's responsibility c. Master is called if developments in sea or weather conditions require decisions beyond the officer's limits of responsibility d. Manoeuvres are adjusted to allow for weather and sea conditions to safely progress the operation and keep the vessel in safe water e. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre and the prevailing weather and sea conditions f. Special handling techniques required under heavy weather conditions are used when necessary

Range Of Variables

MANOEUVRE AND HANDLE THE VESSEL IN NORMAL CONDITIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently within broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental nautical principles and manoeuvring techniques in normal operational contexts. Ability to implement the plan for vessel operations is required. Defined accountability and responsibility for self and others in achieving the outcomes is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Manoeuvres may be carried out <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Manoeuvres may include: <ul style="list-style-type: none"> c.1. berthing and unberthing c.2. mooring or anchoring c.3. handling vessel in shallow water, rivers, estuaries and restricted waters c.4. navigating in and near 'traffic separation schemes' and 'vessel traffic service areas' c.5. use of propulsion and manoeuvring systems c.6. dragging an anchor and clearing a foul anchor d. Special handling techniques required may include: <ul style="list-style-type: none"> d.1. launching rescue boats and survival craft d.2. taking on board survivors from rescue boats and survival craft d.3. manoeuvring to rescue a person overboard d.4. keeping an unmanageable vessel out of the trough of the sea d.5. lessening drift d.6. using oil
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW 95 Convention and Code a.5. AMSA Marine Orders a.6. vessel's log a.7. vessel's operational plan a.8. company procedures a.9. vessel manufacturer's instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards

Range Of Variables (continued)

MANOEUVRE AND HANDLE THE VESSEL IN NORMAL CONDITIONS

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. SOLAS Convention a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MANOEUVRE AND HANDLE THE VESSEL IN NORMAL CONDITIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manoeuvre the vessel <ul style="list-style-type: none"> a.1.1. safely in both normal situations a.1.2. in normal and adverse weather conditions a.1.3. when underway a.1.4. in berthing and unberthing operations a.1.5. when anchoring or mooring a.2. Exercise all required safety and hazard control procedures when manoeuvring the vessel a.3. Identify typical manoeuvring problems and take appropriate action a.4. Communicate effectively with others during manoeuvring operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a navigational watch on a vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and Conventions and AMSA Marine Orders applicable for vessels of 500 gross tonnage and more b. Relevant OH&S legislation and policies c. Limits of responsibility of an officer-in charge of-the-watch on a vessel of 500 gross tonnage and more d. Methods for controlling vessel speed and direction e. Procedures for turning a vessel in various situations including: <ul style="list-style-type: none"> e.1. constant rate of turn techniques e.2. turning a vessel 'short turn around' e.3. turning a vessel on a reciprocal track in an emergency e.4. procedures for the use of rate of turn indicators for the safe handling of the vessel f. Manoeuvring and engine characteristics for various types of vessels of 500 gross tonnage or more, including stopping distances and turning circles at various draughts, speeds and loading g. Effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances h. Squat, shallow water and similar effects on vessel's handling i. Effects on vessel handling of wind, currents and bottom topography j. Manoeuvring problems for vessels of 500 gross tonnage or more and appropriate action and solutions k. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' l. Procedures for berthing operations m. Procedures for anchoring operations, including: <ul style="list-style-type: none"> m.1. preparations to be made on deck for anchoring a vessel m.2. functions and operation of windlass and capstan m.3. methods of clearing a fouled anchor or hawse m.4. methods of hanging off an anchor m.5. methods of slipping a cable m.6. causes and signs of anchor dragging m.7. arrangements for stowing and securing anchors and cables m.8. care and maintenance of anchors, cables and anchor lockers n. Procedures for the rigging and maintenance of personnel and pilot passageways during vessel manoeuvres o. Maritime communication techniques, including issuing of helm and engine orders and tug communications
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. operate a vessel simulator, meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of simulated manoeuvring situations, weather and loading conditions; and/or b. manoeuvre a vessel of 500 gross tonnage or more in an appropriate range of situations, weather and loading conditions

Evidence Guide (continued)

MANOEVRE AND HANDLE THE VESSEL IN NORMAL CONDITIONS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 completing manoeuvring operations a.2 identifying and evaluating manoeuvring problems and determining an appropriate courses of action a.3 identifying and implementing improvements to manoeuvring procedures a.4 applying safety precautions relevant to manoeuvring operations a.5 assessing operational capability of vessel and manoeuvring plant and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.6 following on-board housekeeping procedures <p>c. Action taken promptly to report manoeuvring accidents and incidents</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	3	3	3	3

TDM MC4 01A MANOEUVRE THE VESSEL AND OPERATE SMALL POWER PLANTS

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to manoeuvre a commercial vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) to ACMW. This includes the operation of small power plants and manoeuvring the vessel during normal operations, including berthing, mooring and anchoring.

The unit is consistent with the related functional standard in Section A II/3 of the STCW 95 Code and the section of the Australian USL Code dealing with the competency requirements of a Master (Class 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manoeuvre the vessel for normal operations</p>	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operation and keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, weather, tide, headreach and stopping distances c. Alterations of heading or power are smooth and controlled at all times d. Communication is clear, concise and acknowledged at all times according to good seamanship e. Suitable mode of steering is selected for the manoeuvre with respect to the area, wind and sea conditions f. Appropriate turn techniques are used during manoeuvres g. Vessel propulsion is controlled as required to progress the operation and complement helm movements h. Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvres i. Appropriate allowance is made for the effects of deadweight, draft, trim, speed and under keel clearance on turning circles and stopping distance j. Anchoring and mooring manoeuvres are carried out in accordance with safe nautical practice k. Adequate resources are organised prior to and during operations
<p>2. Handle vessel when under way</p>	<ul style="list-style-type: none"> a. The effects on vessel performance of shallow and restricted waters, tidal and wind conditions and passing vessel's and own vessel's bow and stern waves are regularly evaluated and the implications for vessel handling assessed b. Appropriate alterations to vessel heading and power are made in response to assessments of the vessel's operational environment c. Special handling techniques are correctly applied during rescues of persons overboard or adverse sea and weather conditions
<p>3. Manoeuvre vessel during adverse weather conditions</p>	<ul style="list-style-type: none"> a. Impending adverse weather and/or ice conditions are identified and the implications for vessel operations are evaluated b. Preparations are made and required precautions are taken to minimise risk and damage to vessel and personnel and time loss on passage within the limits of the officer's responsibility c. Manoeuvres are adjusted to allow for weather and sea conditions to safely progress the operation and keep the vessel in safe water d. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre and the prevailing weather and sea conditions e. Special handling techniques required under heavy weather conditions are used when necessary

Range Of Variables

MANOEUVER THE VESSEL AND OPERATE SMALL POWER PLANTS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant Maritime regulations. b. Work requires limited responsibility for the management of the manoeuvring of a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) to ACMW. c. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the operation of small marine power plants and the application of nautical principles and manoeuvring techniques across a defined range of contexts. Planning and carrying out the required manoeuvres for a vessel is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include a commercial vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) to ACMW b. Manoeuvres may be carried out <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Manoeuvres may include: <ul style="list-style-type: none"> c.1. berthing and unberthing c.2. mooring or anchoring c.3. handling vessel in shallow water, rivers, estuaries and restricted waters c.4. navigating in and near 'traffic separation schemes' and 'vessel traffic service areas' c.5. use of small marine power plants c.6. dragging an anchor and clearing a foul anchor d. Special handling techniques required may include: <ul style="list-style-type: none"> d.1. launching rescue boats and survival craft d.2. taking on board survivors from rescue boats and survival craft d.3. manoeuvring to rescue a person overboard d.4. keeping an unmanageable vessel out of the trough of the sea d.5. lessening drift
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts a.3. relevant maritime regulations a.4. vessel's log a.5. vessel's operational plan a.6. company procedures a.7. vessel manufacturer's instructions and recommended procedures a.8. instructions of relevant Maritime Authorities a.9. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of Australian USL Code a.2. Sections of the IMO STCW 95 Code and Convention related to a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) a.3. relevant sections of AMSA Marine Orders a.4. International Regulations for Preventing Collisions at Sea a.5. relevant OH&S legislation

Evidence Guide

MANOEUVER THE VESSEL AND OPERATE SMALL POWER PLANTS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manoeuvre the vessel <ul style="list-style-type: none"> a.1.1. safely in both normal situations a.1.2. in normal and adverse weather conditions a.1.3. when underway a.1.4. in berthing and unberthing operations a.1.5. when anchoring or mooring a.2. Exercise all required safety and hazard control procedures when manoeuvring the vessel a.3. Identify typical manoeuvring problems and take appropriate action a.4. Communicate effectively with others during manoeuvring operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of master on a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) to ACMW</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant maritime regulations b. Relevant OH&S legislation, codes of practice, policies and procedures c. Limits of responsibility of a master of a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) to ACMW d. Methods for controlling vessel speed and direction e. Vessel turn techniques including Williamson turn and short turn around f. Techniques for turning a vessel across the tide across the wind g. Typical manoeuvring characteristics and small power plant operational techniques for vessels up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage), including stopping distances and turning circles at various draughts, speeds and loading h. Effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances i. Squat, shallow water and similar effects on vessel's handling j. Effects on vessel handling of wind, currents and bottom topography k. Typical manoeuvring problems for vessels up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage), and appropriate action and solutions l. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' m. Methods for a recovering a person from the water n. Maritime communication techniques, including issuing of helm and engine orders and tug communications
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. operate a suitable vessel simulator over an appropriate range of simulated manoeuvring situations, weather and loading conditions; and/or b. manoeuvre a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) in an appropriate range of situations, weather and loading conditions

Evidence Guide (continued)

MANOEUVER THE VESSEL AND OPERATE SMALL POWER PLANTS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 completing manoeuvring operations a.2 identifying and evaluating manoeuvring problems and determining an appropriate courses of action a.3 identifying and implementing improvements to manoeuvring procedures a.4 applying safety precautions relevant to manoeuvring operations a.5 assessing operational capability of vessel and manoeuvring power plant and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of power plant and machinery, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes b.6 waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	2	3	3

TDM MC5 01A MANOEUVRE A VESSEL LESS THAN 80METRES IN LENGTH IN ANY PREVAILING CONDITIONS

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to manoeuvre a small commercial vessel up to 80m in length in any prevailing conditions, including the operation of propulsion and manoeuvring systems during normal operations, management of the vessel during heavy weather and seas and manoeuvring the vessel during normal berthing, mooring and anchoring operations.

The unit is consistent with the related functional standard in the Australian USL Code dealing with the competency requirements of a Master (Class 4).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manoeuvre the vessel for normal operations</p>	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operation and keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, weather, tide, headreach and stopping distances c. Alterations of heading or power are smooth and controlled at all times d. Communication is clear, concise and acknowledged at all times according to good seamanship principles e. Suitable mode of steering is selected for the manoeuvre with respect to the area, wind and sea conditions f. Appropriate turn techniques are used during manoeuvres g. Vessel propulsion is controlled as required to progress the operation and complement helm movements h. Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvres i. Appropriate allowance is made for the effects of deadweight, draft, trim, speed and under keel clearance on turning circles and stopping distance j. Vessel is safely and correctly turned across the tide across the wind when necessary in accordance with established maritime practice k. Anchoring and mooring manoeuvres are carried out in accordance with safe nautical practice l. Adequate resources are organised prior to and during operations
<p>2. Handle vessel when under way</p>	<ul style="list-style-type: none"> a. The effects on vessel performance of shallow and restricted waters, tidal and wind conditions and passing vessel's and own vessel's bow and stern waves are regularly evaluated and the implications for vessel handling assessed b. Appropriate alterations to vessel heading and power are made in response to assessments of the vessel's operational environment c. Special handling techniques are correctly applied during launching of boats or liferafts, during rescues of persons overboard or in adverse sea and weather conditions

3. **Manoeuvre vessel during heavy sea and weather conditions**
 - a. Impending adverse weather conditions are identified and the implications for vessel operations are evaluated
 - b. Preparations are made and required precautions are taken to minimise risk and damage to vessel and personnel and time loss on passage within the limits of the officer's responsibility
 - c. Manoeuvres are adjusted to allow for weather and sea conditions to safely progress the operation and keep the vessel in safe water
 - d. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre and the prevailing weather and sea conditions
 - e. Appropriate action is taken in emergency situations involving the safety of the vessel and its cargo, and person both on board the vessel or on other vessels
 - f. Special handling techniques required under heavy weather conditions are used when necessary

Range Of Variables

MANOEUVRE A VESSEL LESS THAN 80METRES IN LENGTH IN ANY PREVAILING CONDITIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in achieving the specified quality and quantity of outcomes. It involves the conduct of routine procedures for the manoeuvring of a vessel during normal operations and in heavy weather conditions and the application of solutions to a defined range of typical manoeuvring situations and problems. Some discretion and judgement is required in anticipating and allowing for possible manoeuvring problems and contingencies and the actions to be taken in these eventualities.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include a commercial vessel up to 80m in length b. Manoeuvres may be carried out <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when slipping a buoy or single point mooring c. Manoeuvres may include: <ul style="list-style-type: none"> c.1. berthing and unberthing c.2. mooring or anchoring c.3. use of small vessel propulsion systems c.4. handling vessel in shallow water, rivers, estuaries and restricted waters c.5. passing close to other vessels c.6. navigating in and near 'traffic separation schemes' and 'vessel traffic service areas' c.7. taking another vessel in tow or being towed c.8. dragging an anchor and clearing a foul anchor d. Special handling techniques required may include: <ul style="list-style-type: none"> d.1. launching rescue boats and survival craft d.2. taking on board survivors from rescue boats and survival craft d.3. manoeuvring to assist another vessel or a ditched aircraft d.4. manoeuvring in following and quartering seas d.5. manoeuvring to keep a vessel out of a trough d.6. manoeuvring to rescue a person overboard d.7. keeping an unmanageable vessel out of the trough of the sea d.8. lessening drift
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts a.3. sections of Australian USL Code dealing with a vessel up to 80m in length on coastal voyages a.4. ship's log a.5. vessel's operational plan a.6. vessel manufacturer's instructions and recommended procedures a.7. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of Australian USL Code related to the manoeuvring of a vessel up to 80m in length on a coastal voyage a.2. regulations for preventing collisions at sea a.3. relevant Australian and State/Territory OH&S legislation

Evidence Guide

MANOEUVRE A VESSEL LESS THAN 80METRES IN LENGTH IN ANY PREVAILING CONDITIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manoeuvre a vessel up to 80 metres in length on a coastal voyage <ul style="list-style-type: none"> a.1.1. safely in normal and emergency situations a.1.2. in normal and heavy weather conditions a.1.3. when underway a.1.4. in berthing and unberthing operations a.1.5. when anchoring or mooring a.2. Exercise all required safety and hazard control procedures when manoeuvring the vessel a.3. Identify typical manoeuvring problems and take appropriate action a.4. Communicate effectively with others during manoeuvring operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of master on a small vessel on a coastal voyage</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Limits of responsibility of a master of a vessel up to 80m in length on a coastal voyage d. Methods for controlling vessel speed and direction e. Techniques for turning a vessel across the tide across the wind f. Manoeuvring characteristics and propulsion system techniques and performance for vessels up to 80m in length on coastal voyages, including stopping distances and turning circles at various draughts, speeds and loading g. Vessel turn techniques including Williamson turn and short turn around h. Effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances i. Squat, shallow water and similar effects on vessel's handling j. Effects on vessel handling of wind, currents and bottom topography k. Manoeuvring methods for the berthing, anchoring, mooring and the launching of boats and liferafts l. Typical manoeuvring problems for up to 80m in length on coastal voyages, and appropriate action and solutions m. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' n. Methods for a recovering a person from the water o. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. operate a suitable ship simulator over an appropriate range of simulated manoeuvring situations, weather and loading conditions; and/or b. manoeuvre a vessel up to 80m in length on a coastal voyage in an appropriate range of situations, weather and loading conditions

Evidence Guide (continued)

MANOEUVRE A VESSEL LESS THAN 80METRES IN LENGTH IN ANY PREVAILING CONDITIONS

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 completing manoeuvring operations a.2 identifying and evaluating manoeuvring problems and determining an appropriate courses of action a.3 applying safety precautions relevant to manoeuvring operations a.4 assessing operational capability of vessel and manoeuvring power plant and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 manufacturer's guidelines relating to the use of power plant and machinery, including instructions on equipment capability and limitations c. Action taken promptly to report and/or rectify manoeuvring incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	2	3	3

TDM MC6 01A MANAGE A PROPULSION UNIT USING THE APPROPRIATE ENGINE SYSTEMS AND SUPPORT SERVICES

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to operate propulsion unit, ancillary power units and equipment on board a commercial vessel up to 80 metres in length in accordance with technical specifications and within safe operating limits at all times. It includes monitoring and operation of related safety and fire detection / detection systems in accordance with formulated emergency procedures and the implementation of all required safety precautions and procedures.

The unit is consistent with relevant section of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate propulsion unit and ancillary power units and equipment</p>	<ul style="list-style-type: none"> a. Controls of propulsion unit, ancillary power units and equipment are operated in accordance with manufacturer's instructions b. Machinery is operated within accepted safety parameters and limits of capacity at all times during a voyage c. Performance of propulsion unit and ancillary power units and equipment is monitored and evaluated d. Appropriate corrective action is taken when performance of propulsion unit or ancillary power units and equipment is found to be unsatisfactory or outside of specified limits e. The relationship between speed and fuel consumption is monitored and action taken as required in accordance with operational instructions f. Safety and hazard minimisation procedures and regulations related to the control propulsion unit, ancillary power units and equipment are followed at all times to maintain the safety of personnel, propulsion and engineering systems, cargo and the vessel g. Correct records are kept relating to the operation and maintenance of propulsion unit or ancillary power units and equipment and any related safety incidents that occur during a voyage
<p>2. Monitor and operate safety and fire detection / suppression systems</p>	<ul style="list-style-type: none"> a. Safety and fire detection / suppression equipment is routinely monitored and checked in accordance with company procedures and regulatory requirements b. Appropriate reporting and corrective action is taken when safety and fire detection / suppression equipment is found to be unserviceable or not functioning correctly c. Responses are coordinated and appropriate action is taken in the event of any breakdown in the remote control systems for propulsion plant, other engineering systems and auxiliary machinery d. Correct records are kept relating to the monitoring of safety and fire detection / suppression equipment and any related remedial action

Range Of Variables

MANAGE A PROPULSION UNIT USING THE APPROPRIATE ENGINE SYSTEMS AND SUPPORT SERVICES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in achieving the specified quality and quantity of outcomes. It involves the routine operation of the propulsion unit, ancillary power units and equipment on a vessel up to 80 metres in length on a coastal voyage. Some discretion and judgement is required in anticipating and allowing for possible operational problems, safety hazards and contingencies.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 80m in length engaged in coastal voyages b. Operation of the propulsion unit, ancillary power units and equipment may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Propulsion unit, ancillary power units and equipment that may be operated or monitored include: <ul style="list-style-type: none"> c.1. propulsion unit and controls c.2. power units and controls c.3. unit and equipment performance indicators c.4. indicators of speed and fuel consumption c.5. steering gear c.6. hydraulic systems and controls c.7. pumps and pumping systems c.8. ancillary systems and controls d. Propulsion units may include: <ul style="list-style-type: none"> d.1. CPP d.2. direct drive shaft d.3. diesel d.4. electric diesel d.5. reduction gear e. Ancillary power units and equipment may include: <ul style="list-style-type: none"> e.1. cooling water e.2. fuel e.3. air starting e.4. lubrication e.5. ballast water e.6. bilge e.7. waste management and pollution control systems as per the MARPOL Convention f. Emergencies may include: <ul style="list-style-type: none"> f.1. loss of propulsion f.2. loss of electrical power f.3. loss of steerage f.4. flooding f.5. fire or explosion
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.1. relevant sections of Australian USL Code related to the operation of propulsion plants and ancillary equipment on a vessel up to 80m in length on a coastal voyage a.2. plant and equipment manufacturer's instructions and recommended procedures a.3. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> b. Applicable procedures and codes may include <ul style="list-style-type: none"> b.1. relevant sections of Australian USL Code related to the operation of propulsion units and ancillary equipment on a vessel up to 80m in length on a coastal voyage b.2. relevant Australian and State/Territory OH&S legislation b.3. MARPOL Convention on waste management and control systems

Evidence Guide

MANAGE A PROPULSION UNIT USING THE APPROPRIATE ENGINE SYSTEMS AND SUPPORT SERVICES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate propulsion unit, ancillary power units and equipment a.2. Monitor and evaluate the performance of vessel's propulsion unit, ancillary power units and equipment a.3. Exercise all required safety and hazard control procedures when operating the propulsion unit, ancillary power units and equipment of the vessel a.4. Monitor and check the operation of safety and fire detection / suppression equipment a.5. Identify typical problems when controlling shipboard propulsion unit, ancillary power units and equipment and take appropriate action a.6. Communicate effectively with others when controlling propulsion unit, ancillary power units and equipment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a vessel up to 80 metres on a coastal voyage.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Methods for controlling and managing the operation of shipboard propulsion units, ancillary power units and equipment d. Characteristics of propulsion units, ancillary power units and equipment for vessels up to 80 metres in length, including operational limits, fuel consumption-speed relationships, vessel stopping distances and turning circles at various draughts, speeds and loading e. Relationship between a vessel's speed and fuel consumption including the meaning of economical RPM and its application f. Procedures for the monitoring and evaluation of the performance of propulsion unit, ancillary power units and equipment g. Dangers associated with the operation of shipboard ancillary power units and related hazard prevention strategies h. Principles and operational and performance requirements of fire detection / suppression systems typically found on vessels up to 80 metres in length i. Sequence of required action when power unit becomes overloaded j. Principles of operation and control of various shipboard emergency systems k. Requirements for waste management and control systems under the MARPOL Convention l. Maritime communication techniques m. Problems with the remote control of propulsion unit, ancillary power units and equipment on vessels of up to 80 metres in length and appropriate preventative and remedial action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and monitor the performance of the propulsion unit, ancillary power units and equipment of a typical vessel up to 80 metres in length over a range of representative operational situations, and/or b. operate a suitable integrated vessel simulator over an appropriate range of simulated propulsion management situations, and/or c. manage the propulsion unit, ancillary power units and equipment on a vessel up to 80 metres in length on a coastal voyage

Evidence Guide (continued)

MANAGE A PROPULSION UNIT USING THE APPROPRIATE ENGINE SYSTEMS AND SUPPORT SERVICES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out propulsion and engineering control operations a.2 identifying and evaluating problems with propulsion unit, ancillary power units and equipment and determining an appropriate courses of action a.3 applying safety precautions relevant to operation of propulsion unit, ancillary power units and equipment a.4 assessing operational capability and performance of propulsion unit, ancillary power units and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 Relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of operation of propulsion unit, ancillary power units and equipment, including instructions on equipment performance, capability and limitations b.5 following on-board housekeeping processes b.6 waste, pollution and recycling management processes and systems <p>c. Action taken promptly to report accidents and incidents</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3

TDM MC7 01A APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING A SMALL VESSEL

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the seamanship skills, knowledge and techniques required when operating a small commercial vessel, including splicing ropes; using ropes and chains; maintaining ropes, wire and chain; rigging gear and loads; operating winches and windlasses; safe handling hawsers and moorings; stowing and securing anchors for sea; securing vessel for rough weather; maintaining watertight integrity; lashing and securing equipment; and towing and being towed.

The unit is consistent with the related functional standards in the Australian USL Code, dealing with the competency requirements of Coxswain and Master (Class5).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Use and maintain ropes, wire and chains</p>	<ul style="list-style-type: none"> a. Knots, hitches and bends using fibre and synthetic ropes are correctly made and used in the course of deck operations onboard vessel b. Eye splices and short splices are made in fibre and synthetic rope in accordance with established nautical practice c. Rope, wire and cables are checked and maintained in accordance with company procedures and manufacturer's instructions d. Breaking strain and safe working loads of ropes are determined and applied as load limits in the course of deck operations e. Loads are correctly rigged using appropriate ropes, chains and rigging gear in accordance with regulations f. Rigging gear is checked prior to use and/or going to sea and faulty gear reported and replaced or repaired g. Maximum load limits are determined and applied when lifting equipment and loads using ropes, chains and rigging h. Lines are made up in preparation for berthing of vessel i. Lines are handled as directed to assist in berthing and unberthing a vessel j. A warping drum is used to heave in surge and veer lines k. Berthing lines are turned up and secured to bits, staghorns and cleats as required l. Moorings and hawsers are safely handled in accordance with established nautical practice
<p>2. Operate winches and windlasses</p>	<ul style="list-style-type: none"> a. Winches, capstans and windlasses are checked and prepared for operation prior to use b. Winches, capstans and windlasses are safely operated to carry out deck operations in accordance with operational requirements and manufacturer's instructions
<p>3. Tow and be towed</p>	<ul style="list-style-type: none"> a. Preparations for towing are safely made in accordance with established nautical practice b. Correct towing procedures and precautions are applied when towing and being towed

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| <p>4. Secure a small vessel for sea</p> | <ul style="list-style-type: none">a. Anchors cables and deck fittings are correctly identified and selected for use when requiredb. Accommodation spaces and personnel facilities onboard the vessel are checked for cleanliness, hygiene and tidiness and correctly secured for sea in accordance with established procedures and tourism or operational standardsc. Equipment and items on deck and in equipment and galley spaces are secured in accordance regulationsd. Watertight integrity of vessel is checked and appropriate action is taken to prepare for prevailing and forecast weather and sea conditionse. Anchor tasks are carried out in accordance with established nautical practice |
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Range Of Variables

APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within defined operational procedures, with responsibility for own outputs and limited responsibility for others in achieving the specified quality of small vessel operations. It involves the organisation and conduct of a range of specified deck operations for a small commercial vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include small commercial vessels engaged on coastal voyages b. Deck operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while towing and being towed c. Deck operations on a small vessel will depend on the limits of responsibility of the person concerned and may include: <ul style="list-style-type: none"> c.1. using and maintaining ropes, wires and chains c.2. splicing natural fibre and synthetic ropes c.3. cleanliness, hygiene and tidiness of accommodation and facilities c.4. checking the watertight integrity of the vessel c.5. checking the securing deck, engineering and accommodation spaces prior to going to sea c.6. assisting in anchor work c.7. work mooring lines and assist in the mooring of the vessel c.8. checking and operating winches, capstans and windlasses c.9. checking and using ropes, chains and rigging gear when lifting loads including the determination of safe working loads d. Anchor work of a small vessel will depend on the limits of responsibility of the person concerned and may include: <ul style="list-style-type: none"> d.1. clearing away an anchor ready for letting go d.2. letting go an anchor and laying out cable d.3. weighing anchor d.4. securing an anchor for sea d.5. assessing when a vessel has its cable and is riding to the anchor d.6. assessing when an anchor is 'aweigh' d.7. operating the forecastle winch, windlass and/or capstan as required for anchor work
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant regulations a.2. ship's operational plan a.3. vessel manufacturer's instructions and recommended procedures a.4. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of Australian USL Code related to the operation of a small vessel a.2. relevant Australian and State/Territory OH&S legislation

Evidence Guide

APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING A SMALL VESSEL

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Organise and carry out deck operations in accordance with established standards of good seamanship a.2. Exercise all required safety and hazard control procedures when manoeuvring the ship a.3. Communicate effectively with others during deck and vessel operations
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master or a coxswain on a small commercial vessel
3. Required knowledge and skills	a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies as they relate to small vessel deck operations c. Parts of a small vessel and the fittings and equipment used in mooring operations d. Names of lines used from various parts of a vessel and the various ways a vessel is made fast to a wharf e. Procedures for berthing and unberthing a small vessel f. Types of anchors, cables and associated deck fittings in common use on small vessels and their purpose g. Procedures involved in anchor work on a small vessel h. Procedures for checking and operating winches, windlasses and capstans during vessel operations i. Methods of making appropriate reports by visual and verbal means to others onboard during vessel operations j. Types of knots, bends and hitches in common use, their applications and limitations, and methods of tying them using synthetic and fibre rope of varying construction and size k. Procedures for splicing synthetic fibre rope l. Factors involved in rope deterioration and maintenance requirements for different types of rope m. Procedures for checking the watertight integrity of a small vessel n. Methods of securing a vessel before it puts to sea o. Procedures for stowing galley appliances, food utensils, containers and supplies for sea p. Procedures for checking and securing personnel accommodation and facilities prior to putting to sea q. Maritime communication techniques
4. Resource implications	Access is required to opportunities to either: a. a suitable range of appropriately-simulated operational situations for a small commercial vessel; and/or b. carry out deck operations on a small vessel

Evidence Guide (continued)

APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING A SMALL VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning seamanship knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out deck operations, anchor work and securing a vessel for sea a.2 towing and being towed a.3 applying safety precautions relevant to deck operations a.4 assessing watertight integrity of the vessel and the security of vessel's equipment and spaces <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of ropes, wires, cables, anchors, deck equipment and machinery, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes <p>c. Action is taken promptly to report accidents, safety incidents and operational problems</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	1

TDM MC8 01A MANOEUVRE A VESSEL LESS THAN 24 METRES IN LENGTH WITHIN INSHORE LIMITS

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to manoeuvre a commercial vessel up to 24m in length within inshore limits. This includes the operation of small vessel propulsion systems and manoeuvring the small vessel during normal operations and adverse weather conditions, including berthing, mooring and anchoring.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Master (Class 5).

ELEMENT	PERFORMANCE CRITERIA
1. Manoeuvre the small vessel for normal operations	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operation and keep the small vessel in safe water b. Small vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, weather, tide, headreach and stopping distances c. Alterations of heading or power are smooth and controlled at all times d. Communication is clear, concise and acknowledged at all times according to good seamanship e. Suitable mode of steering is selected for the manoeuvre with respect to the area, wind and sea conditions f. Suitable techniques are applied when manoeuvring in shallow water and narrow channels g. Appropriate turn techniques are used during manoeuvres h. Small vessel propulsion is controlled as required to progress the operation and complement helm movements i. Safe operating limits of small vessel propulsion, steering and power systems are not exceeded in normal manoeuvres j. Appropriate allowance is made for the effects of deadweight, draft, trim, speed and under keel clearance on turning circles and stopping distance k. Correct procedures are adopted when crossing a bar l. Anchoring and mooring manoeuvres are carried out in accordance with safe nautical practice m. Adequate resources are organised prior to and during operations
2. Handle small vessel when under way	<ul style="list-style-type: none"> a. The effects on small vessel performance of shallow and restricted waters, tidal and wind conditions and passing ship's and own vessel's bow and stern waves are regularly evaluated and the implications for small vessel handling assessed b. Appropriate alterations to small vessel heading and power are made in response to assessments of the vessel's operational environment c. Special handling techniques are correctly applied during rescues of persons overboard or adverse sea and weather conditions d. Correct manoeuvres are used when launching boats or liferafts
3. Manoeuvre small vessel during adverse weather conditions	<ul style="list-style-type: none"> a. Impending adverse weather and/or ice conditions are identified and the implications for small vessel operations are evaluated b. Preparations are made and required precautions are taken to minimise risk and damage to small vessel and personnel and time loss on passage within the limits of the officer's responsibility c. Manoeuvres are adjusted to allow for weather and sea conditions to safely progress the operation and keep the small vessel in safe water d. Small vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre and the prevailing weather and sea conditions e. Special handling techniques required under heavy weather conditions are used when necessary

Range Of Variables

MANOEUVRE A VESSEL LESS THAN 24 METRES IN LENGTH WITHIN INSHORE LIMITS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within defined operational procedures, with responsibility for own outputs and limited responsibility for others. It involves the operation of small vessel propulsion systems and the application of nautical principles and manoeuvring techniques across a range of predictable inshore contexts. Planning and carrying out the required manoeuvres for a small vessel is required, including solving predictable small vessel manoeuvring problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include a small commercial vessel up to 24 m in length operating within inshore limits b. Manoeuvres may be carried out <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when crossing a bar c. Manoeuvres may include: <ul style="list-style-type: none"> c.1. berthing and unberthing c.2. mooring or anchoring c.3. handling small vessel in shallow water, narrow channels, rivers, estuaries and restricted waters c.4. use of small marine power plants c.5. dragging an anchor and clearing a foul anchor d. Special handling techniques required may include: <ul style="list-style-type: none"> d.1. launching lifeboats and liferafts d.2. taking on board survivors from rescue boats and survival craft d.3. manoeuvring to rescue a person overboard d.4. keeping an unmanageable small vessel out of the trough of the sea d.5. lessening drift d.6. using oil
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts a.3. relevant maritime regulations a.4. small vessel's log a.5. small vessel's operational plan a.6. small vessel manufacturer's instructions and recommended procedures a.7. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code a.2. International Regulations for Preventing Collisions at Sea a.3. relevant Australian and State/Territory OH&S legislation

Evidence Guide

MANOEUVRE A VESSEL LESS THAN 24 METRES IN LENGTH WITHIN INSHORE LIMITS

<p>1. Critical aspects of evidence to be considered</p>	<p>Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a. Manoeuvre the small vessel <ul style="list-style-type: none"> a.1. safely in both normal situations a.2. in normal and adverse weather conditions a.3. when underway a.4. in berthing and unberthing operations a.5. when anchoring or mooring b. Exercise all required safety and hazard control procedures when manoeuvring the small vessel c. Identify typical manoeuvring problems and take appropriate action d. Communicate effectively with others during manoeuvring operations
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of master on a small vessel up to 24 m in length operating within inshore limits
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Limits of responsibility of a master of a small vessel up to 24 m in length operating within inshore limits d. Methods for controlling small vessel speed and direction e. Small vessel turn techniques including Williamson turn and short turn around f. Techniques for turning a small vessel across the tide across the wind g. Manoeuvring characteristics and propulsion system operational techniques for of vessels up to 24 m in length operating within inshore limits, including stopping distances and turning circles at various draughts, speeds and loading h. Effects of rudders and propellers on small boat performance i. Effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances j. Manoeuvring procedures for small vessels during adverse sea and weather conditions k. Manoeuvres for a small vessel to approach an anchorage l. Squat, shallow water, narrow channel and similar effects on small vessel's handling m. Effects on small vessel handling of wind, currents and bottom topography n. Typical manoeuvring problems for small vessels up to 24 m in length operating within inshore limits, and appropriate action and solutions o. Interaction effects with passing and moored vessels and appropriate manoeuvring procedures to be applied p. Manoeuvring procedures when launching lifeboats and liferafts q. Methods for a recovering a person from the water r. Maritime communication techniques, including issuing of helm and engine orders and tug communications
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. operate a suitable small vessel simulator over an appropriate range of simulated manoeuvring situations, weather and loading conditions; and/or b. manoeuvre a vessel up to up to 24 m in length on coastal voyages

Evidence Guide (continued)

MANOEUVRE A VESSEL LESS THAN 24 METRES IN LENGTH WITHIN INSHORE LIMITS

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 completing manoeuvring operations for a small vessel a.2 identifying and evaluating manoeuvring problems and determining appropriate courses of action a.3 applying safety precautions relevant to manoeuvring operations for small vessels a.4 assessing operational capability of small vessel and propulsion system and associated equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of propulsion system and associated equipment, including instructions on equipment capability and limitations c. Action taken promptly to report and/or resolve manoeuvring incidents d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	2	3	1	2	2

TDM MC9 01A MANOEUVRE A COMMERCIAL VESSEL OF LESS THAN 12 METRES IN LENGTH WITHIN INSHORE LIMITS

Field C Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to manoeuvre a commercial vessel of less than 12 metres in length within inshore limits, including berthing, mooring and anchoring operations and manoeuvring during emergencies and exceptional circumstances.

The unit is consistent with the relevant sections of the Australian USL Code dealing with the competency requirements of a Coxswain.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manoeuvre the vessel for required operations in normal conditions</p>	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operation and keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, weather, tide, headreach and stopping distances c. Alterations of heading or power are smooth and controlled at all times d. Communication is clear, concise and acknowledged at all times according to good seamanship e. Suitable mode of steering is selected for the manoeuvre with respect to the area, wind, tide and sea conditions f. Vessel propulsion units are controlled as required to progress the operation and complement steering movements g. Safe operating limits of vessel propulsion, steering and power systems are not exceeded h. Adequate resources are organised prior to and during operations i. Communication during manoeuvres is clear, concise and acknowledged at all times
<p>2. Manoeuvre the vessel during exceptional circumstances and emergencies</p>	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operations during the emergency or exceptional circumstance and to keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, the nature of the emergency or exceptional circumstance and the existing sea, tide and weather conditions c. Risks to the vessel and the safety of persons on board are assessed during manoeuvres and appropriate risk minimisation strategies are developed and applied d. Alterations of heading or power are smooth and controlled at all times and are appropriate to the emergency or exceptional situation e. Action is taken in the event of collision, grounding or other marine casualty to secure the vessel and maintain the safety of the vessel and those on-board and of any other vessels and persons involved f. Communication during the emergency is clear, concise and acknowledged at all times

Range Of Variables

MANOEUVRE A COMMERCIAL VESSEL OF LESS THAN 12 METRES IN LENGTH WITHIN INSHORE LIMITS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws Code dealing with vessels of less than 12 metres. b. Work is performed to defined procedures/methods either individually or in a team environment. It involves the use of some discretion and judgement in the application of fundamental nautical principles and known manoeuvring techniques across a variety of operational contexts for vessels of less than 12 metres operating within inshore limits.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel of less than 12 metres in length operating within inshore limits b. Propulsion units may be in-board or out-board and may include single or twin propeller systems c. Manoeuvres may be carried out <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any possible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring c.6. when beaching and refloating a vessel c.7. while crossing coastal bars d. Manoeuvres may include: <ul style="list-style-type: none"> d.1. berthing and unberthing d.2. berthing in a pen d.3. mooring or anchoring d.4. handling vessel in shallow water, rivers, estuaries and restricted waters d.5. steering astern through an "s" configuration d.6. use of in-board or out-board propulsion systems d.7. towing and being towed d.8. turning a vessel across the tide across the wind d.9. dragging an anchor and clearing a foul anchor e. Manoeuvres will occur within in-shore limits including <ul style="list-style-type: none"> e.1. at sea e.2. in tidal streams e.3. in confined waters e.4. in proximity to other vessels that are berthed, at anchor, underway but stopped, or underway and making way, particularly large vessels f. Emergencies may include: <ul style="list-style-type: none"> f.1. loss of rudder or propeller f.2. man overboard f.3. collision f.4. grounding f.5. when hove to f.6. fire or flooding on board vessel. g. Special handling techniques required in adverse weather may include: <ul style="list-style-type: none"> g.1. manoeuvring in the face of strong winds, high sea state, heavy swell and surf g.2. keeping an unmanageable vessel out of the trough of the sea g.3. lessening drift g.4. assisting a vessel in distress g.5. towing operations g.6. launching rescue boats and survival craft g.7. taking on board survivors from rescue boats and survival craft
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational instructions a.2. navigational charts a.3. relevant maritime regulations a.4. vessel's log a.5. vessel manufacturer's instructions and recommended procedures a.6. instructions of relevant Maritime Authorities a.7. occupational health and safety instructions and regulations

Range Of Variables (continued)

MANOEUVRE A COMMERCIAL VESSEL OF LESS THAN 12 METRES IN LENGTH WITHIN INSHORE LIMITS

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. Sections of the Australian Uniform Shipping Laws Code applicable to vessels of less than 12 metres operating within offshore limits a.2. International Regulations for Preventing Collisions at Sea a.3. relevant Australian and State/Territory occupational health and safety legislation

Evidence Guide

MANOEUVRE A COMMERCIAL VESSEL OF LESS THAN 12 METRES IN LENGTH WITHIN INSHORE LIMITS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manoeuvre a vessel of less than 12 metres in length within in-shore limits: <ul style="list-style-type: none"> a.1.1. in normal and emergency situations and adverse weather conditions a.1.2. when underway a.1.3. when anchoring or mooring a.1.4. during berthing and unberthing operations a.1.5. while anchoring or mooring a.1.6. when beaching and refloating a vessel a.1.7. while crossing coastal bars a.2. Exercise all required safety and hazard control procedures when manoeuvring a vessel of less than 12 metres in length within in-shore limits a.3. Identify manoeuvring problems and take appropriate action a.4. Communicate effectively with others during manoeuvring operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the coxswain of a vessel of less than 12 metres in length operating within offshore limits.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Manoeuvring and propulsion characteristics for vessels of less than 12 metres in length operating, including stopping distances and turning circles at various draughts, speeds and loading c. Effects of displacement and planing hulls on manoeuvring characteristics of small power driven vessels d. Principles of stability and trim in a small vessel and the disposition of passengers and/or cargo required to maintain stability and trim within safe limits e. Manoeuvring problems for vessels of less than 12 metres in and appropriate action and solutions f. Methods for controlling vessel speed and direction g. Effects on manoeuvres of wind, currents and bottom topography h. Characteristics of adverse weather and sea conditions and the related precautions and manoeuvring techniques that should be applied to maintain the control and stability of the vessel i. Requirements of the International Regulations for Preventing Collisions at Sea and other regulations set by local authorities j. Maritime communication techniques k. Relevant OH&S legislation and policies
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. manoeuvre a working or training vessel of less than 12 metres in length in an appropriate range of normal and real or simulated emergency in-shore situations including normal and adverse weather conditions; and/or b. operate a suitably-realistic small vessel simulator over an appropriate range of simulated manoeuvring situations and weather conditions

Evidence Guide (continued)

MANOEUVRE A COMMERCIAL VESSEL OF LESS THAN 12 METRES IN LENGTH WITHIN INSHORE LIMITS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 completing defined manoeuvring operations a.2 identifying and evaluating manoeuvring problems and determining an appropriate courses of action a.3 applying safety precautions relevant to manoeuvring operations a.4 assessing operational capability of vessel and propulsion plant and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 Relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 manufacturer's guidelines relating to the use of propulsion and other on-board equipment, including information on capability and limitations <p>c. Action taken promptly to report accidents and navigational incidents</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	2	2

TDM MC10 01A STEER A COMMERCIAL VESSEL UNDER THE DIRECTION OF THE OFFICER IN CHARGE OF THE WATCH

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to steer a commercial vessel under the direction of the Officer in Charge of the Watch on a steady course within acceptable limits having regard to the area of navigation and prevailing sea state. This also includes making smooth and controlled alterations of course when required, maintaining clear and concise communications at all times and acknowledging orders in a seamanlike manner.

The unit is consistent with the related functional standard in Section A III/4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4.

ELEMENT	PERFORMANCE CRITERIA
1. Steer the vessel	<ul style="list-style-type: none"> a. Vessel is steered under the direction of the Officer of the Watch in response to helm orders and set course b. Vessel's heading is maintained within acceptable limits with respect to the directions of the Officer of the Watch, given helm orders, the area of navigation, weather and sea condition and tide c. Vessel's steady course is maintained for ten minutes within 2 degrees d. Alterations of heading are smooth and controlled at all times e. Communication is clear, concise and acknowledged at all times according to good seamanship f. Steering is changed from automatic pilot to manual steering and vice versa in accordance with the directions of the Officer of the Watch, helm orders, vessel's procedures and manufacturer's instructions g. Safe operating limits of vessel's steering systems are not exceeded h. Steering techniques are consistent with the prevailing weather and sea conditions or possible states of emergency
2. Respond to orders	<ul style="list-style-type: none"> a. The directions of the Officer of the Watch and helm orders are correctly understood, acknowledged and promptly acted upon b. Confirmation or clarification of directions and helm orders is sought where they are not clearly understood

Range Of Variables

STEER A COMMERCIAL VESSEL UNDER THE DIRECTION OF THE OFFICER IN CHARGE OF THE WATCH

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW Conventions and Codes. b. Work is performed under the directions of the Officer in Charge of the Watch using a prescribed range of procedures/methods either individually or in a team environment with some accountability for the quality of outcomes. c. Work involves the use of known and defined steering techniques across a variety of navigational contexts in response to the directions of the Officer of the Watch
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Steering may include hand steering or automatic pilot c. Steering of the vessel may be carried out <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any possible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring c.6. when navigating in and near 'traffic separation schemes' and 'vessel traffic service areas' c.7. in shallow water, rivers, estuaries and restricted waters c.8. when towing and being towed c.9. when dragging an anchor and clearing a foul anchor d. Helm orders will be given in the English language and require sufficient proficiency in speaking and understanding in English to communicate effectively with the master and others on the bridge of the vessel. e. Emergencies may include: <ul style="list-style-type: none"> e.1. man overboard e.2. collision e.3. grounding e.4. when hove to e.5. fire or flooding on board vessel. f. Special steering techniques required in adverse weather may include: <ul style="list-style-type: none"> f.1. steering in the face of strong winds, high sea state, heavy swell and surf f.2. steering an unmanageable vessel out of the trough of the sea in response to helm orders f.3. steering to assist a vessel in distress f.4. steering during towing operations f.5. steering during the launching of rescue boats and survival craft f.6. steering when taking on board survivors from rescue boats and survival craft
3. Sources of information / documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.1. helm orders a.2. company and vessel procedures a.3. vessel manufacturer's instructions and recommended procedures a.4. instructions of relevant Maritime Authorities a.5. occupational health and safety instructions and regulations
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to steering and navigation of vessels a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

STEER A COMMERCIAL VESSEL UNDER THE DIRECTION OF THE OFFICER IN CHARGE OF THE WATCH

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Steer a vessel under the directions of the Officer in Charge of the Watch and in response to helm orders: <ul style="list-style-type: none"> a.1.1. in normal and emergency situations and adverse weather conditions a.1.2. when underway a.1.3. when anchoring or mooring a.1.4. during berthing and unberthing operations a.1.5. while anchoring or mooring a.1.6. during emergencies a.2. Exercise all required safety and hazard control procedures when steering a vessel a.3. Identify typical steering problems and take appropriate action a.4. Communicate effectively with others in the bridge team when steering a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of IMO STCW Convention and Codes and AMSA Marine Orders applicable to the steering of vessels b. Relevant OH&S legislation, codes of practice, policies and procedures c. Limits of responsibility of a rating on a vessel carrying out steering duties d. Principles and procedures for steering a vessel e. Typical helm orders and steering action required f. Procedures for changing over from automatic pilot to hand steering and vice versa g. Effects on steering of wind, currents and bottom topography h. Steering problems for various sizes of vessels and appropriate action and solutions i. Steering techniques in and near 'traffic separation schemes' and 'vessel traffic service areas' j. Ability to communicate effectively in the English language with the Master and others in the bridge team k. Maritime communication techniques, including responding to helm orders
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. steer a vessel simulator, meeting the requirements of Section A I/12 of the IMO STCW Code, over an appropriate range of simulated manoeuvring situations, weather and loading conditions; and/or b. steer a working or training vessel under the direction of the Officer in Charge of the Watch over an appropriate range of situations, weather and loading conditions

Evidence Guide (continued)

STEER A COMMERCIAL VESSEL UNDER THE DIRECTION OF THE OFFICER IN CHARGE OF THE WATCH

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 steering the vessel under the direction of the Officer in Charge of the Watch a.2 identifying and steering problems and determining appropriate courses of action a.3 applying safety precautions relevant to steering of a vessel a.4 assessing operational capability of steering system and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders applicable to the steering of vessels b.2 ISM Code and associated ship's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of steering equipment, including information on capability and limitations b.6 following bridge housekeeping procedures c. Action is taken promptly to report and/or rectify steering incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDM ME1 01A UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

Field E Communication

DESCRIPTION:

This unit involves the skills and knowledge to communicate effectively with others in the course of shipboard duties on board a commercial vessel, including understanding and interpreting orders.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers under the STCW Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Communicate with officers, crew and others in performing duties</p>	<ul style="list-style-type: none"> a. Orders are attended to, interpreted and implemented in accordance with established nautical practice b. Effective listening skills are demonstrated c. Questions are used to gain additional information d. Verbal and written communication with others in the performance of duties is clear and precise and uses the standard nautical vocabulary and follows established communications practice e. Misunderstandings in communications are avoided using appropriate confirmation techniques and established communications practice f. Appropriate techniques are used when communicating with others in multilingual crew to ensure that communications are effective and messages are clearly understood g. Various forms of non-verbal communication are appropriately used when working and communicating with others in the course of shipboard duties
<p>2. Participate in group discussions to achieve appropriate work outcomes</p>	<ul style="list-style-type: none"> a. Responses are sought and provided to others in the group b. Constructive contributions are made in terms of the process involved c. Goals or outcomes are communicated and/or recorded

Range Of Variables

UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Orders given by a master or senior officer are understood and implemented either individually or in a team environment with some accountability for the quality of outcomes. c. Work involves the use of known and prescribed communication techniques across a variety of shipboard work contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Communications may include written, verbal and non-verbal communications with crew, officers and others in the course of normal duties c. Communications may be with: <ul style="list-style-type: none"> c.1. English speaking persons c.2. multilingual crew c.3. persons with limited ability to communicate in English d. Communication problems may include: <ul style="list-style-type: none"> d.1. misunderstanding d.2. limited ability of others to communicate in English d.3. noisy environments or communications channels d.4. illegible writing or print d.5. use of non-standard vocabulary d.6. incorrect assumption that message has been received and/or correctly understood
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. Relevant sections of the IMO STCW Convention and Code and AMSA Marine Orders a.3. IMO Standard Marine Communication Phrases a.4. shipboard work instructions a.5. orders given by a master or an officer a.6. company communication procedures a.7. company directions and written procedures a.8. work and safety signs and symbols a.9. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. ISM Code a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Understand and follow orders given by a master or an officer onboard a vessel a.2. Communicate with others effectively using written, verbal and non-verbal methods a.3. Use the standard nautical vocabulary when communicating with others on-board a vessel a.4. Read and interpret signs and symbols relevant to a rating's duties a.5. Communicate effectively with others in a multilingual crew when performing rating's duties a.6. Identify typical communication problems and take appropriate action
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of maritime regulations dealing with communication onboard a vessel b. Relevant OH&S legislation, codes of practice, policies and procedures c. Maritime communication techniques including barriers to effective communication and how to overcome them d. Principles of effective communication e. Established written, verbal and non-verbal communications practices f. Standard nautical vocabulary as described in the 'IMO Standard Marine Communication Phrases' publication g. Protocols and procedures for communicating with others on-board a vessel h. Techniques for communicating effectively with other members of a multilingual crew i. Typical communication problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate performance in a range of suitably-simulated communication activities covering situations that are typically experienced on a vessel; and/or a.2. demonstrate communications skills and knowledge in an appropriate range of operational situations on board an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. communicating on board a vessel a.2. understanding and implementing orders in relation to shipboard duties a.3. identifying and evaluating communication problems and determining appropriate courses of action a.4. identifying and implementing improvements to communication methods a.5. assessing the effectiveness of communications b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2. ISM Code and associated ship's Safety Management System and procedures b.3. OHS regulations policies and procedures b.4. job procedures and work instructions c. Action taken promptly to report and/or rectify communication problems in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

UNDERSTAND ORDERS AND BE UNDERSTOOD IN RELATION TO SHIPBOARD DUTIES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	1

TDM ME2 01A COMMUNICATE USING STANDARD MARINE VOCABULARY

Field E Communication

DESCRIPTION:

This unit involves the skills and knowledge communicate effectively on board a commercial vessel through written, verbal and non-verbal methods, including the use charts and other nautical publications, interpreting and understanding meteorological information and messages concerning vessel's safety and operation, communicating with vessels and coast stations and performing required officer's duties involving communication with a multilingual crew. It includes the ability to use, understand and apply the Standard Marine Navigational Vocabulary as replaced by the 'IMO Standard Marine Communication Phrases'.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2, and the relevant sections of the Australian USL Code

ELEMENT	PERFORMANCE CRITERIA
1. Read, interpret and apply information in nautical charts and publications	<ul style="list-style-type: none"> a. Charts required for watchkeeping and navigational duties are read and correctly interpreted and required information is extracted and appropriately applied to work activities in accordance with established practice b. Information in nautical publications used in day-to-day work is correctly accessed, read and interpreted and applied to work activities
2. Receive, interpret and apply meteorological information and messages	<ul style="list-style-type: none"> a. Published and radio transmitted meteorological information is obtained, interpreted and applied to work activities b. Messages concerning vessel safety and operations involving written or verbal communications are read or received, clarified, correctly interpreted and applied to work activities
3. Communicate with other vessels and coast stations	<ul style="list-style-type: none"> a. Communications with other vessels and coast stations are correctly carried out with the aid of radio communications equipment using standard nautical vocabulary and following established protocols and regulatory requirements b. Information given during communications with other vessels and coast stations is accurately and clearly provided including confirmation that it has been correctly received and understood c. Information received during communications with other vessels and coast stations is clarified if necessary, correctly interpreted and acted upon d. Where required, received information is recorded or relayed to others in accordance with established procedures and regulatory requirements e. Records of communications with other vessels and coast stations are completed in accordance with established procedures and regulatory requirements
4. Communicate with officers, crew and others in performing duties	<ul style="list-style-type: none"> a. Written and verbal communication with others in the performance of officer's duties is clear and precise and uses the standard nautical vocabulary and follows established communications practice b. Misunderstandings in communications are avoided using appropriate confirmation techniques and established communications practice c. Appropriate techniques are used when communicating with multilingual crew to ensure that communications are effective and messages are clearly understood d. Various forms of non-verbal communication are appropriately used when working and communicating with others

Range Of Variables

COMMUNICATE USING STANDARD MARINE VOCABULARY

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of established communication principles and practice and the standard nautical vocabulary in written, electronic, verbal and non-verbal communications with others in the course of officer duties. Limited accountability and responsibility for self and others in achieving the outcomes is involved. Work requires the judgement and ability to communicate effectively with others in the course of maritime duties.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Communications may include: <ul style="list-style-type: none"> b.1. reading and interpretation of nautical charts and publications b.2. reading and interpretation of signs and symbols used on-board vessels b.3. communications with other vessels and coast stations using appropriate equipment b.4. electronic communications including email b.5. written, verbal and non-verbal communications with crew, officers and others in the course of normal duties c. Communications may be with: <ul style="list-style-type: none"> c.1. English speaking persons c.2. multilingual crew c.3. persons with limited ability to communicate in English d. Communication problems may include: <ul style="list-style-type: none"> d.1. misunderstanding d.2. limited ability of others to communicate in English d.3. noisy environments or communications channels d.4. illegible writing or print d.5. use of non-standard vocabulary d.6. incorrect assumption that message has been received and/or correctly understood d.7. faulty communications equipment
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. 'IMO Standard Marine Communication Phrases' a.3. operational orders a.4. navigational charts a.5. annual and weekly notices to mariners a.6. protocols for vessel-to-vessel and vessel-to-shore communications a.7. company communication procedures a.8. vessel's log a.9. industrial award requirements a.10. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. Australian USL Code a.4. relevant international, Australian and State/Territory OH&S legislation a.5. Australian equal employment legislation and related policies

Evidence Guide

COMMUNICATE USING STANDARD MARINE VOCABULARY

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Communicate with others effectively using written, verbal and non-verbal methods when performing duties a.2. Use the standard nautical vocabulary when communicating with others on-board a vessel and with other vessels and coast stations a.3. Read and interpret charts, signs and symbols relevant to duties a.4. Identify typical communication problems and take appropriate action
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a watch on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Maritime communication techniques including barriers to effective communication and how to overcome them d. Established written, verbal and non-verbal communications practices e. Relevant industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements f. Principles of effective communication g. Standard nautical vocabulary as described in the 'IMO Standard Marine Communication Phrases' publication h. Protocols and procedures for communicating with others on-board a vessel and with other vessels and coast stations i. Techniques for communicating effectively with a multilingual crew j. Typical communication problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate performance in a range of suitably-simulated communication exercises and case studies covering communication situations that are typically experienced on a vessel; and/or a.2. demonstrate communications skills and knowledge in an appropriate range of operational situations on board an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 communicating on board a vessel a.2 identifying and evaluating communication problems and determining appropriate courses of action a.3 identifying and implementing improvements to communication methods a.4 assessing the effectiveness of communications b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 equal employment and OHS regulations policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations c. Action taken promptly to report and/or rectify communication problems in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

COMMUNICATE USING STANDARD MARINE VOCABULARY

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	1	1

TDM ME3 01A TRANSMIT AND RECEIVE INFORMATION BY VISUAL SIGNALLING

Field E Communication

DESCRIPTION:

This unit involves the skills and knowledge required to visually send and receive information by means of either a flashing light in code or flags using the International Code of signals.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code, Marine Orders Part 3, Issue 5, Appendix 2, and the relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Use code to visually send and receive messages	a. Codes for letters and numerals are correctly recognised b. A message is correctly sent in code using a flashing light c. A message transmitted in code by flashing light is correctly decoded
2. Use the International Code of Signals to send and receive messages	a. Flags used in the International Code of Signals are correctly described and interpreted b. A message is correctly coded and sent with flags using the International Code of Signals c. A message coded and sent with flags using the International Code of Signals is correctly decoded and interpreted d. Special messages are sent and received using flags in accordance with the protocols and procedures laid down in the International Code of Signals
3. Maintain records of visual communications	a. Records of messages sent and received using visual communications are completed in accordance with the international Code of signals and other related international codes and conventions

Range Of Variables

TRANSMIT AND RECEIVE INFORMATION BY VISUAL SIGNALLING

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of principles of visual signalling to accurately send and receive messages using flashing lights and flags. Correct coding and decoding of messages using the International Code of Signals is required. Limited accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires the accurate and consistent use of signalling lights and flags to send and receive messages using the International Code of Signals.
2. Worksite environment	<ul style="list-style-type: none"> a. Visual communications may include signalling with lights using code or signalling with flags using the International Code of Signals b. Visual communications may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while anchored or moored c. Special messages for signalling may include: <ul style="list-style-type: none"> c.1. distress c.2. urgency c.3. safety c.4. navigational c.5. medical advice
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. vessel's log a.4. International Code of Signals a.5. records of visual communications
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to visual signalling a.2. relevant sections of AMSA Marine Orders related to visual signalling a.3. Australian USL Code a.6. International Code of Signals

Evidence Guide

TRANSMIT AND RECEIVE INFORMATION BY VISUAL SIGNALLING

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none"> a. Assessment must confirm appropriate knowledge and skills to: <ul style="list-style-type: none"> a.1. Send and receive messages in code using a flashing light a.2. Send and receive messages using flags in accordance with the International Code of Signals a.3. Maintain records of visual communications
2. Interdependent assessment of units	<ul style="list-style-type: none"> a. This unit of competency may be assessed in conjunction with other mandatory units that form part of a job role of an officer on a commercial vessel.
3. Required knowledge and skills	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. International Code of signals c. Procedures for using a flashing light to send visual messages using code d. Procedures for sending visual messages with flags using the International Code of Signals e. Techniques for recognising and decoding visual messages sent with flags using the International Code of Signals f. Techniques for sending and receiving special visual messages with flags g. Visual signalling problems and appropriate action and solutions h. Procedures for keeping records of visual communications
4. Resource implications	<ul style="list-style-type: none"> a. Access is required to opportunities to either: <ul style="list-style-type: none"> a.1. demonstrate performance in suitably-simulated visual communications exercises covering a range of communication situations typically experienced on a vessel; and/or a.2. demonstrate the use of visual communications in an appropriate range of operational situations on board an operational commercial or training vessel
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 carrying out visual communications activities on board a vessel a.2 identifying and evaluating visual communication signalling problems and determining appropriate courses of action a.3 maintaining records of visual communications b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 job procedures and work instructions b.3 guidelines relating to the use of a light and flags visual communications between vessels c. Action is taken promptly to report visual communications in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2

TDM ME5 01A TRANSMIT AND RECEIVE INFORMATION BY MARINE RADIO OR TELEPHONE

Field E Communication

DESCRIPTION:

This unit involves the skills and knowledge required to transmit and receive information by marine radio or telephone on board a commercial vessel, including using marine VHF and HF radiotelephone in accordance with regulations, carrying out user-maintenance and fault-finding procedures on radio equipment and power supplies, and operating an emergency position indicating beacon (EPIRB) and a search and rescue transponder (SART).

The unit is consistent with the Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service, 1987, the AMSA Marine Orders Part 6, and the Australian USL Code, Section 2, Schedule 5.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate VHF and HF Radio equipment to transmit and receive messages</p>	<p>a. Types of radio equipment are selected and operated within limits of specifications</p> <p>b. Radio equipment is operated to transmit and receive various types of signal in accordance with manufacturer's instructions, established radio operation procedures and regulatory requirements</p> <p>c. Regulations and procedures applicable to vessel stations equipped with radiotelephony and digital selective calling (DSC) facilities are applied during radio communications</p> <p>d. OHS procedures and hazard control strategies are applied when operating radio equipment in accordance with vessel's ISM Code safety management system</p>
<p>2. Maintain and fault-find radio equipment</p>	<p>a. Routine maintenance checks are carried out on radiotelephony equipment in accordance with manufacturer's instructions and specifications and company procedures</p> <p>b. Out-of-specification performance and faults in radio equipment are correctly identified and investigated using prescribed fault-finding techniques in accordance with established user maintenance procedures and manufacturer's instructions</p> <p>c. Identified faults and defective radio equipment and component parts are rectified or replaced in accordance with manufacturer's instructions and established maintenance procedures</p>
<p>3. Access search and rescue radio facilities</p>	<p>a. Application is made the appropriate organisation for the provision of the required search and rescue services</p> <p>b. Information required by AUSREP (Australian Ship Reporting) system is supplied in the required format</p>
<p>4. Deploy and operate an EPIRB and a SART</p>	<p>a. Routine checks are carried out on Emergency Position Indicating Radio Beacons (EPIRBs) and Search and Rescue Transmitters (SARTs) to confirm their operational capability in accordance with manufacturer's instructions and specifications</p> <p>b. Appropriate action is taken to rectify or replace EPIRBs or SARTs that are found to be malfunctioning or are inoperable in accordance with manufacturer's instructions and company procedures</p> <p>c. Emergency Position Indicating Radio Beacons (EPIRBs) and Search and Rescue Transmitters (SARTs) are deployed as required in accordance with manufacturer's instructions and established search and rescue procedures</p>

Range Of Variables

TRANSMIT AND RECEIVE INFORMATION BY MARINE RADIO OR TELEPHONE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service (1987), and maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of principles of marine radiotelephony to accurately transmit and receive messages. Use of correct procedures for transmitting and receiving of signals using HF and VHF equipment, as well as deployment and operation of satellite EPIRBs and SARTs is required. Limited accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires the accurate and consistent use and user maintenance of radio equipment to send and receive messages and signals under normal and emergency situations in accordance with international and national radio regulations.
2. Worksite environment	<ul style="list-style-type: none"> a. Radio and radiotelephony communications may be carried out in both normal and emergency situations using shipboard HF and VHF radio equipment, Emergency Position Indicating Radio Beacons (EPIRBs) and SARTs b. Radio and radiotelephony communications may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather b.3. while underway b.4. while anchored or moored c. Radio equipment may include: <ul style="list-style-type: none"> c.1. radiotelephony transceiving equipment, including: <ul style="list-style-type: none"> c.1.1. medium frequency / high frequency equipment (MF/HF) c.1.2. very high frequency equipment (VHF) c.2. digital selective calling (DSC) equipment c.3. Emergency Position Indicating Radio Beacon (EPIRB) c.4. Search and Rescue Transmitter (SART) c.5. batteries c.6. aerials c.7. electrical and radio cable connections c.8. electrical fuses d. Radio communications may include: <ul style="list-style-type: none"> d.1. normal vessel-to-vessel service d.2. normal vessel-to-shore service d.3. on-demand service d.4. auto seaphone service d.5. auto seaphone 999 service d.6. distress d.7. urgency d.8. safety d.9. navigational d.10. medical advice d.11. emergency position signals e. Organisations with whom radio communications may be conducted may include: <ul style="list-style-type: none"> e.1. coast stations e.2. limited coast stations e.3. private shore stations e.4. volunteer coast guard stations. e.5. search and rescue coordination centre location and operator e.6. state police forces e.7. company bases e.8. fishing organisations and cooperatives

Range Of Variables (continued)

TRANSMIT AND RECEIVE INFORMATION BY MARINE RADIO OR TELEPHONE

2. Worksite environment (continued)	<ul style="list-style-type: none"> f. Available radio services may include: <ul style="list-style-type: none"> f.1. medical advice services f.2. search and rescue f.3. AUSREP f.4. public correspondence g. EPIRB frequencies may include: <ul style="list-style-type: none"> g.1. 406 MHz g.2. 121.5 / 243 MHz
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. sections of IMO STCW 95 Code concerning radio communications a.2. sections of AMSA Marine Orders concerning radio communications a.3. radiotelephony regulations a.4. radio communications log a.5. radio equipment manufacturer's specifications and instructions a.6. records of radio communications
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include <ul style="list-style-type: none"> a.1. relevant sections of maritime regulations a.2. Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service (1987), a.3. Australian radio communications legislation including: <ul style="list-style-type: none"> a.3.1. Australian Communications Authority Act a.3.2. Radiocommunications Act (1992) a.3.3. Telecommunications Act a.3.4. Telecommunications (Transitional Provisions and Consequential Amendments) Act

Evidence Guide

TRANSMIT AND RECEIVE INFORMATION BY MARINE RADIO OR TELEPHONE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate VHF and HF radio equipment to transmit and receive messages a.2. Maintain and fault-find radio equipment a.3. Access search and rescue radio facilities a.4. Deploy and operate an EPIRB and a SART a.5. Maintain records of radio communications
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a person with a responsibility for radio communications onboard a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant regulations related to marine radio communications b. Different types of marine radio equipment, their features, applications, operating characteristics and operating procedures c. Basic principles and procedures for marine radio communications d. Purpose for and procedures for the monitoring of calling and working frequencies e. Radio calling, replying and relaying procedures f. Purpose of silence periods when operating radio equipment g. Limitations on the performance of different types of marine radio equipment h. Methods of communicating vessel position i. Hazards associated with radio transmission and the repair and maintenance of radio equipment and related hazard control measures and OHS regulations. j. A basic understanding of the Australian marine search and rescue system k. Procedures for the transmitting and decoding of the phonetic alphabet excluding the figure code l. Operational checks including: <ul style="list-style-type: none"> l.1. checking of radio performance l.2. testing fuses l.3. measuring capacity of batteries and the specific gravity of the electrolyte l.4. measuring on and off load voltage. m. Typical radio equipment faults and defects and related fault finding techniques and remedial procedures n. Procedures for deploying and operating EPIRBs and SARTs o. Typical radio communications problems and appropriate action and solutions p. Procedures for keeping records of radio communications
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate performance in suitably-simulated radio communications activities and exercises covering a range of normal and emergency radio communication situations that are typically experienced on a vessel; and/or a.2. use radio communications in an appropriate range of operational situations on board an operational commercial or training vessel

Evidence Guide (continued)

TRANSMIT AND RECEIVE INFORMATION BY MARINE RADIO OR TELEPHONE

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. operating VHF and HF radio equipment to transmit and receive messages a.2. maintaining and fault-finding radio equipment a.3. accessing search and rescue radio facilities a.4. deploying and operating an EPIRB and a SART a.5. identifying and evaluating radio communication problems and determining appropriate courses of action a.6. maintaining records of radio communications <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2. OHS procedures and legislation b.3. job procedures and work instructions b.4. guidelines relating to the use of a radio communications equipment on-board the vessel <p>c. Action is taken promptly to report radio communications problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2

TDM ME8 01A TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

Field E Communication

DESCRIPTION:

This unit involves the skills and knowledge required to transmit and receive information by GMDSS sub-systems and equipment on board a commercial vessel, including using the equipment for search and rescue radio-communications, preventing false distress alerts, mitigating the effects of false distress alerts, implementing preventative safety measures in relation to radio equipment hazards, and providing radio services during emergencies such as abandonment of vessel, fire onboard vessel, and breakdown of radio installations.

The unit is consistent with the Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service, 1987, the AMSA Marine Orders Part 6, and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate GMDSS sub-systems and equipment to transmit and receive messages</p>	<p>a. Types of GMDSS communication equipment are selected and operated within limits of specifications</p> <p>b. GMDSS communication equipment is operated to transmit and receive various types of signal in accordance with manufacturer's instructions, established GMDSS procedures and regulatory requirements</p> <p>c. GMDSS procedures appropriate for the sea area concerned are correctly applied in accordance with regulatory requirements</p> <p>d. Regulations and procedures applicable to vessel stations equipped with GMDSS communications equipment and digital selective calling (DSC) facilities are applied during radio communications</p> <p>e. OHS procedures and hazard control strategies are applied when operating radio equipment in accordance with vessel's ISM Code safety management system</p>
<p>2. Maintain and fault-find radio equipment</p>	<p>a. Routine maintenance checks are carried out on GMDSS equipment in accordance with manufacturer's instructions and specifications and company procedures</p> <p>b. Out-of-specification performance and faults in GMDSS equipment are correctly identified and investigated using prescribed fault-finding techniques in accordance with established user maintenance procedures and manufacturer's instructions</p> <p>c. Identified faults and defective GMDSS equipment and component parts are rectified or replaced in accordance with manufacturer's instructions and established maintenance procedures</p>
<p>3. Provide radio services during emergencies</p>	<p>a. Radio procedures as defined in the international and national radio regulations and SOLAS Convention are applied during emergency situations and search and rescue operations</p>

Range Of Variables

TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service (1987), and maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of principles of marine radiotelephony to accurately transmit and receive messages using the GMDSS system. Use of correct procedures for transmitting and receiving of signals using GMDSS equipment appropriate for the sea area concerned, as well as deployment and operation of satellite EPIRBs and SARTs is required. Limited accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires the accurate and consistent use and user maintenance of the GMDSS system to send and receive messages and signals under normal and emergency situations in accordance with international and national radio regulations.
2. Worksite environment	<ul style="list-style-type: none"> a. Communications may be carried out in both normal and emergency situations using shipboard GMDSS equipment appropriate for the sea area concerned, Emergency Position Indicating Radio Beacons (EPIRBs) and SARTs b. Communications using the GMDSS system may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather b.3. while underway b.4. while anchored or moored c. Radio equipment may include: <ul style="list-style-type: none"> c.1. radiotelephony transceiving equipment, including: c.2. medium frequency / high frequency equipment (MF/HF) c.3. very high frequency equipment (VHF) c.4. digital selective calling (DSC) equipment c.5. ECG receiver c.6. Navtext receiver c.7. Emergency Position Indicating Radio Beacon (EPIRB) c.8. Search and Rescue Transmitter (SART) c.9. batteries c.10. antennas c.11. electrical and radio cable connections c.12. electrical fuses d. Radio communication procedures may include: <ul style="list-style-type: none"> d.1. calling a coast station by radiotelephone d.2. ordering a manually switched call d.3. terminating a call d.4. special facilities available, including methods of calling a coast station by DSC selecting an automatic radiotelephone call e. Radio communications may include: <ul style="list-style-type: none"> e.1. normal vessel-to-vessel service e.2. normal vessel-to-shore service e.3. port operations service e.4. vessel movement service e.5. distress e.6. urgency e.7. safety e.8. navigational e.9. medical advice e.10. on-board communications e.11. emergency position signals

Range Of Variables (continued)

TRANSMIT AND RECEIVE INFORMATION BY MARINE RADIO OR TELEPHONE

<p>2. Worksite environment (continued)</p>	<p>f. Organisations with whom radio communications may be conducted may include:</p> <ul style="list-style-type: none"> f.1. coast stations f.2. limited coast stations f.3. private shore stations f.4. pilot and port stations f.5. aircraft stations Rescue Coordination Centres f.6. volunteer coast guard stations. f.7. search and rescue coordination centre location and operator f.8. state police forces f.9. company bases f.10. fishing organisations and cooperatives <p>g. Available radio services may include:</p> <ul style="list-style-type: none"> g.1. medical advice services g.2. search and rescue g.3. AUSREP g.4. Inmarsat services (A, B, C, M and E) g.5. public correspondence <p>h. EPIRB frequencies may include:</p> <ul style="list-style-type: none"> h.1. 406 MHz h.2. 121.5 / 243 MHz
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code concerning radio communications a.2. sections of AMSA Marine Orders and USL Code concerning radio communications a.3. SOLAS Convention a.4. radiotelephony regulations a.5. radio communications log a.6. radio equipment manufacturer's specifications and instructions a.7. records of radio communications
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable regulations and legislation may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to marine radio communications a.2. relevant sections of AMSA Marine Orders related to marine radio communications a.3. Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service (1987) a.4. SOLAS Convention a.5. Australian radio communications legislation including: a.6. Australian Communications Authority Act a.7. Radiocommunications Act (1992) a.8. Telecommunications Act a.9. Telecommunications (Transitional Provisions and Consequential Amendments) Act

Evidence Guide

TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate GMDSS sub systems and equipment to transmit and receive messages a.2. Maintain and fault-find GMDSS radio equipment a.3. Access search and rescue radio facilities a.4. Deploy and operate an EPIRB and a SART a.5. Maintain records of radio communications
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a person with a responsibility for radio communications onboard a commercial vessel using the GMDSS System.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of maritime regulations related to marine radio communications b. International and national radio regulations applicable to mobile marine communications c. Principles of radio propagation, including: <ul style="list-style-type: none"> c.1. basic propagation mechanisms at LF, MF, HF and VHF c.2. Maximum Useable Frequency (MUF) c.3. Optimum Working Frequency (OWF) c.4. frequency bands c.5. classes of emission c.6. duplex, simplex paired frequencies and ITU channels d. Different types of marine radio equipment, their features, applications, operating characteristics and operating procedures e. Prohibitions of connecting non-GMDSS equipment f. Types, applications and features of basic antenna systems used in marine radio communications g. Basic principles and procedures for marine radio communications, including: <ul style="list-style-type: none"> g.1. correct use of frequencies, frequency bands and modes of emission g.2. frequencies for routine call and reply g.3. distress, urgency and safety communications g.4. definition of coverage and sea areas for Digital Selective Calling (DSC) g.5. radio calling, replying and relaying procedures g.6. purpose of silence periods when operating radio equipment g.7. limitations on the performance of different types of marine radio equipment g.8. purpose for and procedures for the monitoring of calling and working frequencies g.9. methods of communicating vessel position h. Procedures for using various GMDSS systems and services, including: <ul style="list-style-type: none"> h.1. Inmarsat services (A, B, C, M and E) h.2. Enhanced Group Calling System (EGC) h.3. DSC facilities and usage h.4. EGC receiver h.5. MSI services h.6. NAVTEXT system h.7. SafetyNET system i. Procedures for deploying and operating survival craft radio equipment including: EPIRBs and SARTs j. The principles and procedures of the Search and Rescue (SAR) system, including: <ul style="list-style-type: none"> j.1. The role of the Rescue Coordination Centre j.2. The role of a SAR unit j.3. The use and operation of vessel reporting systems including AUSREP and AMVER k. Maintenance strategies and requirements for GMDSS equipment as defined in SOLAS and Radio Regulations l. Operational checks including: <ul style="list-style-type: none"> l.1. checking of radio performance (using built in test facilities) l.2. testing fuses l.3. measuring capacity of batteries and the specific gravity of the electrolyte l.4. measuring on and off load voltage. m. Radio equipment faults and defects and related fault finding techniques and remedial procedures

Evidence Guide (continued)

TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

<p>3. Required knowledge and skills (continued)</p>	<p>n. Hazards associated with radio transmission and the repair and maintenance of radio equipment and related hazard control measures and OHS regulations.</p> <p>o. A basic understanding of the Australian marine search and rescue system</p> <p>p. Procedures for the transmitting and decoding of the phonetic alphabet excluding the figure code</p> <p>q. Radio communications problems and appropriate action and solutions</p> <p>r. Procedures for keeping records of radio communications</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <p>a.1. demonstrate performance in suitably-simulated radio communications activities using the GMDSS System covering a range of normal, emergency and search and rescue radio communication situations that may be typically experienced on a vessel; and/or</p> <p>a.2. use GMDSS radio communications equipment in an appropriate range of operational situations on board an operational commercial or training vessel</p>
<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1. operating GMDSS sub-systems and equipment to transmit and receive messages</p> <p>a.2. maintaining and fault-finding GMDSS equipment</p> <p>a.3. accessing search and rescue radio facilities</p> <p>a.4. deploying and operating an EPIRB and a SART</p> <p>a.5. identifying and evaluating radio communication problems and determining appropriate courses of action</p> <p>a.6. maintaining records of radio communications</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1. relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders</p> <p>b.2. OHS procedures and legislation</p> <p>b.3. job procedures and work instructions</p> <p>b.4. guidelines relating to the use of a GMDSS communications sub-systems and equipment on-board the vessel</p> <p>c. Action is taken promptly to report radio communications problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	2	2	1	2	3

TDM MF1 01A ASSIST IN SEARCH AND RESCUE OPERATIONS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to assist in the planning, and coordination of search and rescue operations at sea in accordance with the procedures contained in the IMO/ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR).

The unit is consistent with the related functional standards in the STCW 95 Code and the relevant sections of the AMSA Marine Orders and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Assist in planning search and rescue operations</p>	<ul style="list-style-type: none"> a. Distress and emergency signals and communications are recognised and evaluated in accordance with procedures and relevant Australian and/or international regulations and conventions b. Emergency is assessed and level and nature of assistance required and its practicability is established c. Communications are established where possible with the parties in distress, other search vessels and/or aircraft and other organisations and persons who may be involved in the search and rescue operation d. Plans for search and rescue comply as closely as possible with relevant Australian and/or international regulations and conventions e. Organisation and command chain with other stations involved in the search and rescue operation is established in collaboration with search and rescue authorities
<p>2. Establish and maintain radio-communications</p>	<ul style="list-style-type: none"> a. Radio communications are established and maintained with the parties in distress, other search vessels and/or aircraft, search and rescue coordination authorities and other organisations and persons who may be involved in the search and rescue operation b. Records are accurately kept of all communications made during the emergency including frequencies and content of messages
<p>3. Assist in search and rescue operations</p>	<ul style="list-style-type: none"> a. Information concerning the emergency is regularly collected from all vessels, aircraft and other parties involved in the search and rescue operation b. Decisions on action taken during the search and rescue are made after analysis of all available information and after consultation with others in the established chain of command c. Directions are given to others involved in the search and rescue operation in accordance with the agreed plan and the established chain of command d. Manoeuvres of vessel as part of search and rescue operations are made in accordance with the agreed plan e. Vessel's officers and crew are briefed on their role during the emergency and are deployed to the required stations f. Manoeuvres of vessel are made safely with due regard to the limits of propulsion, steerage and vessel stability and the prevailing weather and sea conditions g. Duration of the search and rescue operations is appropriate to the level of the emergency and complies with instructions from the company and search and rescue authorities h. Records of the incident are made in the vessel's log and other documentation is completed as required by relevant Australian and/or international regulations and conventions

Range Of Variables

COORDINATE SEARCH AND RESCUE OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant rules and regulations b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of a significant range of search and rescue coordination principles and techniques across a wide and often unpredictable variety of maritime emergency contexts. Contribution to the development of a broad plan or strategy for the coordination of marine search and rescue operations is required. c. Work requires significant judgement in planning, technical and leadership functions related to search and rescue operations and procedures.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Search and rescue operations may be carried out <ul style="list-style-type: none"> b.1. by day or night b.2. under any possible weather and sea conditions b.3. as sole vessel in the operation b.4. in conjunction with other vessels, aircraft and other parties c. Party in distress may include: <ul style="list-style-type: none"> c.1. vessel(s) in distress c.2. person(s) in distress in sea c.3. person(s) in distress in survival craft c.4. ditched aircraft d. Distress signal or request for assistance may originate from: <ul style="list-style-type: none"> d.1. vessel(s) in distress d.2. person(s) in distress in sea d.3. person(s) in distress in survival craft d.4. ditched aircraft in sea d.5. observer on a vessel at sea d.6. land-based source d.7. request from a search and rescue centre e. Co-ordination of search and rescue operations may include: <ul style="list-style-type: none"> e.1. receiving and relaying instructions from search and rescue authorities e.2. establishing the required organisational arrangements and chain of command e.3. establishing and maintaining a communications net e.4. communicating with others in the chain of command e.5. establishing position of distressed person(s), vessel or aircraft e.6. developing a plan of action for the search and rescue operations e.7. implementing contingency plans e.8. evaluating progress information on the search and rescue operation e.9. making operational decisions concerning the operation e.10. receiving and/or giving directions to others during the operation e.11. maintaining accurate records of the operation and its outcomes f. Signals and communications may be by radio and/or visual methods and may be maintained with: <ul style="list-style-type: none"> f.1. party in distress f.2. search and rescue authorities f.3. other vessels f.4. aircraft f.5. other parties involved in the rescue g. Special handling techniques required during a rescue may include: <ul style="list-style-type: none"> g.1. assisting a vessel or aircraft in distress g.2. towing operations g.3. launching rescue boats and survival craft g.4. taking on board survivors from rescue boats and survival craft

Range Of Variables (continued)

COORDINATE SEARCH AND RESCUE OPERATIONS

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. instructions of relevant Australian and/or international search and rescue authorities a.2. IMO/ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR). a.3. relevant regulations and codes a.4. operational orders a.5. navigational charts a.6. vessel's log a.7. company procedures a.8. vessel manufacturer's instructions and recommended procedures a.9. ISM Code safety management system plans, procedures, checklists and instructions,(where relevant) a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and/or international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant international, Australian and/or State/Territory search and rescue conventions and regulations a.2. relevant regulations and codes a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and/or State/Territory OH&S legislation

Evidence Guide

COORDINATE SEARCH AND RESCUE OPERATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Recognise and respond to distress and emergency calls a.2. Interpret the requirements of the IMO / ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) when participating in a real or simulated search and rescue operation a.3. Assist in the planning and coordination of real or simulated search and rescue operations in conjunction with search and rescue authorities and other relevant parties a.4. Manoeuvre vessel safely during a real or simulated search and rescue operation a.5. Identify typical search and rescue problems and take appropriate action a.6. Communicate effectively with search and rescue authorities and others during real or simulated search and rescue operations a.7. Record the search and rescue incident accurately in accordance with company and international and Australian regulatory requirements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant regulations and codes for various types and sizes of vessels b. Awareness and understanding of the role of a vessel's master when involved in search and rescue operations as described in the IMO/ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR). c. Relevant OH&S legislation, codes of practice, policies and procedures d. Search and rescue techniques and procedures e. Responsibilities when coordinating search and rescue operations f. Chain of command and organisational requirements used in search and rescue operations g. Sequence of action to be taken upon sighting or receiving a distress signal or a call for assistance h. Procedures for fixing the position of a distress signal or call for assistance i. Drift patterns of disabled vessels and survival craft in relation to wind and current j. Types of distress and emergency signals and types of response required in each case k. Maritime communication techniques applicable to search and rescue operations l. Typical search and rescue problems and appropriate action and solutions m. Principles involved in determining the duration and scope of a search n. Types of search patterns and their application o. Effects on vessel handling of wind, currents and bottom topography p. Typical manoeuvring and engine characteristics for vessels of 500 gross tonnage or more, including stopping distances and turning circles at various draughts, speeds and loading q. Constant rate of turn techniques r. Mandatory knowledge and skills in personal survival techniques, fire fighting and fire prevention required of all seafarers
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to assist in the planning, coordination and conduct of a search and rescue operations, and/or b. assist in the planning, coordination and conduct of a suitably-simulated search and rescue operation, including possible operation of a suitable vessel simulator over an appropriate range of simulated search and rescue situations

Evidence Guide (continued)

COORDINATE SEARCH AND RESCUE OPERATIONS

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 assisting in real or simulated search and rescue operations a.2 identifying and evaluating search and rescue problems and determining appropriate courses of action a.3 identifying and implementing improvements to procedures when assisting in search and rescue processes a.4 applying safety precautions relevant to search and rescue operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant regulations and codes b.2 OHS regulations and hazard prevention policies and procedures b.3 ISM Code and associated vessel's Safety Management System and procedures (where relevant) b.4 relevant manufacturer's guidelines relating to the use of equipment, including instructions on equipment capability and limitations b.5 search and rescue procedures b.6 environmental protection during search and rescue operations c. Action taken promptly to report and/or rectify accidents and incidents arising during search and rescue operations in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	3	1	3	2

TDM MF2 01A RESPOND TO NAVIGATIONAL EMERGENCIES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to respond to navigational emergencies such as beaching, grounding and collision of a commercial vessel, including taking action in emergencies to limit damage and protect and safeguard all persons on board a vessel.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code, and relevant sections of the AMSA Marine Orders and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Take action prior to and during a navigational emergency</p>	<ul style="list-style-type: none"> a. Navigational emergencies are recognised and appropriate action is taken in accordance with Australian and international regulations to avoid or minimise the emergency b. Radar, effective watchkeeping and other available means are used to determine and minimise risk of collision with another vessel c. Where a navigational emergency is unavoidable, appropriate warnings are given to officers and crew and other vessels and persons who may be affected d. Where a navigational emergency has occurred, all possible action to minimise risk to officers, crew and other persons is taken in accordance with company procedures and international regulations e. In the event of 'man overboard', appropriate action is taken to manoeuvre the vessel and to deploy survival equipment f. Directions are given to officers and crew to manage and control the emergency g. Appropriate action is taken to stabilise the emergency situation h. Distress signals or calls for assistance are made if required in accordance with Australian and international regulations and conventions
<p>2. Perform damage control measures after a navigational emergency</p>	<ul style="list-style-type: none"> a. Shipboard equipment and areas are shut down and isolated in accordance with the nature and extent of the emergency, company procedures and limits of responsibility b. On-board personnel are mustered in accordance with company procedures relevant to the identified emergency c. On-board personnel and external agencies are notified of the navigational emergency and action being taken d. Emergency equipment and damage control materials are prepared in accordance with the nature and extent of the threat or danger e. Nature and extent of damage to vessel is assessed and an appropriate damage control strategy is devised using available equipment, materials and personnel f. Directions are given to officers and crew on action to be taken to manage and control damage to the vessel g. Records are maintained of damage control measures taken during the emergency and their outcomes
<p>3. Manage the abandonment of the vessel</p>	<ul style="list-style-type: none"> a. Where it is assessed that the emergency is a serious risk to on-board personnel, correct procedures are initiated to abandon the vessel b. On-board personnel are mustered in accordance with company procedures and international regulations and are given the required directions and instructions as per practiced drills c. Preparation and deployment of survival equipment by officers and crew is correctly coordinated

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|--|--|
| 4. Refloat a grounded vessel | <ul style="list-style-type: none">a. The extent of grounding of the vessel is assessed including possible damage to the integrity of the hullb. The timing of tides are checked and an appropriate plan for the refloat the vessel is devised in accordance with company procedures and maritime principlesc. External assistance to refloat the vessel is sought where necessaryd. Action is taken to control any identified damage to the hull using appropriate meanse. Preparations for refloating are made in accordance with company procedures, good nautical practice and vessel manufacturer's instructionsf. On-board personnel are advised of refloating plan and their responsibilitiesg. Vessel is refloated in accordance with company procedures and plan of action |
| 5. Coordinate emergency towing operations | <ul style="list-style-type: none">a. Vessel is prepared for towage in accordance with company and vessel's manufacturer's instructionsb. Towing operation is carried out in accordance with accepted maritime practicec. Towing lines are carefully monitored during towing operation and appropriate action is taken if there is excessive risk to either the towing or towed vessel |

Range Of Variables

RESPOND TO NAVIGATIONAL EMERGENCIES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of a emergency principles and techniques across a wide and often unpredictable variety of navigational emergency situations. Contribution to the development of a plan or strategy to respond to specific navigational emergencies is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Responses to navigational emergencies may be required: <ul style="list-style-type: none"> b.1. by day or night b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Navigational emergencies may include: <ul style="list-style-type: none"> c.1. loss of steering control c.2. loss of motive power c.3. grounding c.4. beaching a vessel c.5. person overboard c.6. rescue and evacuation of injured personnel c.7. collision with another vessel c.8. explosion or fire on board vessel c.9. impairment of integrity of hull d. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> d.1. use of softwood wedges and plugs to reduce water ingress d.2. erection and application of vertical shoring d.3. construction and fitting of a leak-stopping mat d.4. temporary repair of a ruptured pressurised pipe d.5. operation of a portable salvage pump e. Damage control measures in a fire or explosion emergency may include: <ul style="list-style-type: none"> e.1. use of appropriate fire fighting equipment and techniques such as various times of fire extinguishers, fire blankets, fire hoses and nozzles, and foam applicators e.2. activation of fixed fire fighting sprinklers and systems e.3. removal of fuel or heat source e.4. boundary cooling techniques f. Survival equipment may include: <ul style="list-style-type: none"> f.1. life jackets f.2. exposure and immersion suits f.3. survival craft
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant regulations a.2. navigational charts a.3. 'Safety of Life at Sea' (SOLAS) Convention a.4. vessel's log a.5. emergency procedures a.6. vessel manufacturer's instructions and recommended procedures for damage control measures a.7. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. relevant sections of Australian USL Code a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

RESPOND TO NAVIGATIONAL EMERGENCIES

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Recognise and assess a navigational emergency a.2. Development and implementation of appropriate strategies to respond to various types of navigational emergencies a.3. Exercise all required safety and hazard control procedures when responding to a navigational emergency a.4. Communicate effectively with others during navigational emergencies
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a vessel.
3. Required knowledge and skills	a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Navigational emergencies for vessels and appropriate action and solutions d. General principles of damage control and the manner in which water tight integrity is maintained on vessels, including the importance of preparation, control and repair e. The concept of reserve buoyancy and its relevance to damage control on board vessels f. Statutory requirements pertaining to damage control in vessels g. Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvas and clothing h. Effects on shiphandling of wind, currents and bottom topography i. Manoeuvring and engine characteristics for various types of vessels, including stopping distances and turning circles at various draughts, speeds and loading j. Maritime communication techniques used during navigational emergencies
4. Resource implications	a. Access is required to opportunities to plan and demonstrate responses to typical navigational emergencies, including possible operation of a suitable vessel simulator, over an appropriate range of simulated emergency situations
5. Consistency in performance	a. Applies underpinning knowledge and skills when: a.1 responding to navigational emergencies a.2 identifying and evaluating navigational emergencies and determining an appropriate courses of action a.3 applying safety precautions relevant to navigational emergencies b. Shows evidence of application of relevant workplace procedures including: b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 emergency procedures and instructions b.4 relevant manufacturer's guidelines relating to the use of emergency machinery, including instructions on equipment capability and limitations b.5 shipboard safety procedures b.6 security procedures during emergencies b.7 environmental protection during emergencies c. Action taken promptly to report and/or respond to navigational emergencies d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

RESPOND TO NAVIGATIONAL EMERGENCIES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	2	3	1	3	2

TDM MF3 01A MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA

Field F Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to monitor compliance with international and Australian legislative requirements and measures to ensure the safety of the life of crew, passengers and others at sea, including coordination of preventative and precautionary procedures, observing compliance, remedying non-compliance and maintaining relevant certification.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Monitor vessel operations and maintenance procedures</p>	<ul style="list-style-type: none"> a. Procedures for monitoring operations and maintenance according to regulatory and company requirements are followed b. Areas and plant equipment are checked and inspected regularly and according to company procedures c. Required measures to ensure safety of life of shipboard personnel at sea are monitored and implemented in accordance with international maritime conventions and Australian legislative requirements
<p>2. Identify and rectify non-compliance with legislative requirements and measures</p>	<ul style="list-style-type: none"> a. Problems that may lead to potential non-compliance are promptly and fully identified b. Remedial action is timely and ensures compliance with government requirements c. Training and instruction on procedures ensures shipboard personnel comply with regulations d. Advice to others on the legitimacy of operations is accurate and given at an appropriate time e. Failure to comply with procedures is identified and dealt with according to company procedures and relevant legislation
<p>3. Maintain required certification of shipboard items and equipment</p>	<ul style="list-style-type: none"> a. Documentation held by the vessel is proved to be complete against authorised inventory b. Certification extensions and requirements for renewals are timely and ensure continuous validity c. Survey items and equipment, with respect to certificate conditions, are in a state which reflects continuing effective programs of tests, checks and maintenance d. Arrangements for renewals and surveys are timely and comply with enterprise and issuing authority requirements e. Vessel's documents reflect adherence to procedures where the validity of certification may be affected by damage, alterations or additions to the vessel or operations f. Procedures are developed to ensure that only authorised personnel access documents
<p>4. Maintain documentation related to legislative requirements</p>	<ul style="list-style-type: none"> a. Certificates and documentation are stored in a manner which optimises their use and accessibility for the prosecution of vessel's business. b. Records are clear concise and accurate c. Records comply with regulatory and company requirements and format d. Any required corrections to records are made in such a manner as to maintain their validity e. Documentation is secure and confidentiality is maintained in accordance with specific procedures f. Computer backup procedures-follow good operating practices and company procedures g. Records and reports are distributed to the required authority at appropriate times and places

Range Of Variables

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant Australian and/or international regulations to ensure the safety of life at sea. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves significant judgement in monitoring compliance with legislative requirements and measures to ensure safety of life at sea across a wide and often unpredictable variety of operational contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Monitoring of compliance may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Legislative and regulatory requirements may include <ul style="list-style-type: none"> c.1. Australian and State/Territory OHS legislation c.2. Port State legislation and regulations related to the safety of life at sea c.3. International Safety Management (ISM) Code (where applicable) c.4. IMO SOLAS Convention d. Measures to maintain the safety of life at sea may include: <ul style="list-style-type: none"> d.1. training of officers and/or crew d.2. regular conduct of life saving and fire-fighting drills d.3. maintenance of life-saving and fire-fighting equipment and survival craft d.4. on-board hazard management identification and minimisation d.5. establishment and maintenance of effective watchkeeping arrangements d.6. maintenance of the seaworthiness of vessel and the serviceability of shipboard plant and equipment
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions (where relevant) a.2. operational orders a.3. relevant regulations, codes and conventions a.4. Australian and international OHS statutory regulations a.5. vessel's log a.6. company procedures a.7. insurance documentation a.8. vessel manufacturer's instructions and recommended procedures a.9. instructions of relevant Maritime Authorities a.10. relevant Australian and/or international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. international conventions and Australian regulations on the protection of life at sea a.5. relevant international, Australian and State/Territory OH&S, environmental and other legislation applicable to international and Australian vessels

Evidence Guide

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Monitor vessel operations and maintenance procedures in terms of compliance with legislative requirements including measures to ensure safety of life at sea a.2. Identify and rectify non-compliance with legislative requirements and measures a.3. Maintain required certification of shipboard items and equipment a.4. Maintain documentation related to legislative requirements a.5. Identify typical legislative compliance problems and take appropriate action a.6. Communicate effectively with others on matters concerning legislative compliance
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the chief engineer and master of a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant regulations, codes and conventions related to the safety of life at sea b. Relevant OH&S legislation and policies c. International and Australian regulatory requirements and company policies, practices and procedures relating to: <ul style="list-style-type: none"> c.1. statutory certification c.2. survey c.3. records d. Regulations and associated measures to ensure safety of life of shipboard personnel at sea e. Problems in maintaining compliance with legislative requirements and measures to ensure safety of life at sea and appropriate action and solutions f. Sources of reference and information on detailed survey and certification requirements g. Systems and methods used for recording, retrieving and storing information, and their strengths and limitations h. Procedures for maintaining the security and confidentiality of information. i. Mandatory knowledge and skills in first aid, personal survival techniques, fire fighting and fire prevention required of all seafarers as required under the relevant maritime regulations
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to ensure compliance with legislative requirements and measures for the safety of life at sea, and/or a.2. where appropriate, assist in maintaining compliance with legislative requirements and measures to ensure safety of life at sea on board an operational vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 monitoring compliance with regulations and measures to ensure the safety of life at sea a.2 identifying and evaluating compliance problems and determining an appropriate courses of action a.3 identifying and implementing improvements to measures to ensure compliance with regulations a.4 assessing operational capability of vessel and manoeuvring plant and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 measures to ensure safety of life at sea b.6 following on-board housekeeping processes c. Action taken promptly to report and/or rectify non-compliance with relevant regulations on the safety of life at sea d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE SAFETY OF LIFE AT SEA

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	3	2

TDM MF4 01A MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to maintain the operational condition of life-saving, fire fighting and other safety systems including the monitoring of the systems and their components to ensure that they function in the event of fire and other shipboard emergencies on board a commercial vessel.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW Code, AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3 and the relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Coordinate the monitoring of the operational condition of life saving, fire detection, fire fighting and other safety systems on board a vessel</p>	<p>a. Procedures for the routine maintenance of life saving, fire detection, fire fighting and other safety systems are established and their implementation coordinated in accordance with regulatory requirements and company procedures</p> <p>b. Routine procedures are followed to check the operational condition of life saving, fire detection, fire fighting and other safety equipment and systems</p> <p>c. Faulty or damaged equipment or components in life saving, fire detection, fire fighting and other safety systems are identified</p> <p>d. Faulty or damaged equipment or components are reported, repaired or replaced in accordance with company procedures and international regulations</p>
<p>2. Coordinate the checking and replacement of consumable materials and items in life saving, fire detection, fire fighting and other safety systems</p>	<p>a. Procedures for the checking and replacement of consumable materials and items in life saving, fire detection, fire fighting and other safety systems are established and their implementation coordinated</p> <p>b. Levels and/or quality of consumable materials and items used in life saving, fire detection, fire fighting and other safety systems are checked in accordance with company procedures and international regulations</p> <p>c. Consumable materials and items used in life saving, fire detection, fire fighting and other safety systems are replenished and replaced as required</p> <p>d. Life saving, fire detection, fire fighting and other safety systems are confirmed as operational following replenishment or replacement of consumable materials and items</p>
<p>3. Maintain documentation on the condition of life saving, fire detection, fire fighting and other safety systems on board a vessel</p>	<p>a. Information on the outcomes of routine monitoring and maintenance of the condition of life saving, fire detection, fire fighting and other safety equipment and systems is recorded as required by company procedures and international regulations</p> <p>b. Information on identified faulty equipment or components in life saving, fire detection, fire fighting and other safety systems and action taken to repair or replace them is documented in accordance with company procedures and international regulations</p> <p>c. Documentation on the checking and replenishment of consumable materials used in life saving, fire detection, fire fighting and other safety system is completed in accordance with company procedures and regulatory requirements</p>

Range Of Variables

MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations, conventions and codes. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the coordination of measures to check the condition of life-saving, fire-fighting and other safety equipment and to initiate repair or replacement where equipment is found to be defective or non-functional. Contribution to the development of a broad strategy for maintaining the operational condition of life-saving, fire-fighting and other safety equipment is involved. d. Work requires significant judgement in planning and coordinating the maintenance of life-saving, fire-fighting and other safety equipment on board vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Maintenance procedures may include: <ul style="list-style-type: none"> b.1. routine checks for operational serviceability of fire-detection, fire- fighting and safety equipment and systems b.2. identification of faults in and damage to fire-detection, fire- fighting, life-saving and safety equipment and initiation of repair or replacement action where required b.3. checking and replacement of consumable items such as extinguisher materials, detector or alarm batteries, etc. c. Fire detection and fire-fighting systems may include: <ul style="list-style-type: none"> c.1. fire detection devices and systems c.2. portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam c.3. CO₂ fixed systems c.4. foam installations including semi-portable and fixed systems c.5. sprinkler systems c.6. fire pumps – main and emergency fire pump c.7. fire hoses, hydrants, branches and international shore connection d. Life-saving and safety systems may include: <ul style="list-style-type: none"> d.1. life jackets d.2. survival craft d.3. life buoys d.4. emergency radio beacons d.5. life saving equipment and consumables e. Consumable materials and items that may used in life saving, fire detection, fire fighting and other safety systems may include: <ul style="list-style-type: none"> e.1. dry and wet chemicals used in fire extinguishers e.2. batteries for detectors, radios, beacons, etc. e.3. flares e.4. survival rations
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) a.2. IMO STCW 95 Convention and Code a.3. AMSA Marine Orders and Australian USL Code (as applicable) a.4. vessel's log a.5. fire-detection, fire- fighting and safety equipment operational and maintenance instructions and recommended procedures a.6. instructions of relevant Maritime Authorities related to the maintenance and serviceability of ship-board fire-detection, fire- fighting and safety equipment and systems a.7. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the IMO STCW 95 Code and Convention, Australian USL Code and AMSA Marine Orders a.2. regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.3. relevant Australian and State/Territory OH&S legislation

MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Check to fire-detection, fire- fighting, life-saving and safety equipment and systems a.2. Identify typical faults in to fire-detection, fire- fighting, life-saving and safety equipment and systems and initiate appropriate repair or replacement action where required a.3. Check and replace consumable materials in fire-detection, fire- fighting, life-saving and safety equipment and systems as required a.4. Communicate effectively with others as required during maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master or engineer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) as they relate to fire-detection, fire- fighting, life-saving and safety equipment and systems c. Types of fire-detection, fire- fighting, life-saving and safety equipment and systems used on board vessels and the procedures for their use d. Relevant regulations, codes of practice, policies and procedures related to the to the maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems e. Methods for checking and replacing consumable materials in typical ship-board fire-detection, fire- fighting and safety equipment and systems f. The importance of maintenance of ship-board fire-detection, fire- fighting, life-saving and safety equipment and systems and the potential consequences if the equipment or systems are not operational during an emergency g. Maritime communication techniques applicable to maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems h. Faults that can occur with shipboard fire-detection, fire- fighting and safety equipment and systems and appropriate remedial action and solutions i. Statutory and typical company requirements for the documentation of maintenance procedures and outcomes for fire-detection, fire- fighting, life-saving and safety equipment and systems used on board vessels
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to coordinate the maintenance of fire-detection, fire- fighting, life-saving and safety equipment and systems typically used on board vessels, and/or b. assist in the coordination of the maintenance procedures for fire-detection, fire- fighting, life-saving and safety equipment and systems on board an operational vessel

Evidence Guide (continued)

MAINTAIN THE OPERATIONAL CONDITION OF LIFE-SAVING, FIRE FIGHTING AND OTHER SAFETY SYSTEMS

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 coordinating the maintenance of on-board fire-detection, fire- fighting, life-saving and safety equipment and systems a.2 identifying and evaluating operational and maintenance problems with fire-detection, fire-fighting, life-saving and safety equipment and systems and determining appropriate courses of action a.3 identifying and implementing improvements to maintenance procedures for fire-detection, fire-fighting, life-saving and safety equipment and systems a.4 assessing operational capability of fire-detection, fire- fighting, life-saving and safety equipment and systems b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of fire-detection, fire- fighting, life-saving and safety equipment and systems, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes c. Action taken promptly to report and/or rectify faulty fire-detection, fire- fighting, life-saving and safety equipment and systems in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	2	1	2	3

**TDM MF5 01A DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND
HANDLE EMERGENCY SITUATIONS**

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to contribute to the development emergency and damage control plans and handling of emergency situations on board a commercial vessel, including the preparation of contingency plans for response to emergencies, plans for damage control, procedures and aids for fire prevention, detection and extinction and the establishment and implementation of life-saving procedures including the use of various life-saving appliances.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW Code and Appendices 2 and 3 of Part 3, Issue 5 of the AMSA Marine Orders AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Prepare contingency plans for emergency response</p>	<ul style="list-style-type: none"> a. Potential emergency situations are identified in conjunction with relevant shipboard personnel b. Plans of action are developed by the master and chief engineer with appropriate assistance from other personnel detailing procedures for responding to potential emergency situations in accordance with regulatory requirements and company procedures c. Resources are organised in readiness for potential implementation of contingency plans d. Contingency plans for dealing with emergency response are documented in accordance with company procedures and regulatory requirements e. Shipboard officers and crew are made aware of contingency plans for emergency response f. Drills are carried out at appropriate times to test the readiness of shipboard personnel to implement emergency contingency plans
<p>2. Develop plans for damage control following a shipboard emergency</p>	<ul style="list-style-type: none"> a. Possible damage scenarios are identified and appropriate methods of damage control are devised by the vessel's management team in accordance with established marine practice b. Plans of action for dealing with shipboard damage, particularly that involving the integrity of the vessel's hull, are developed by the vessel's management team in accordance with regulatory requirements and company procedures c. Planned damage control procedures for dealing with damage to the vessel and its hull are documented in accordance with company procedures and regulatory requirements d. Appropriate resources are organised in readiness for possible deployment should there be damage to the vessel during an emergency
<p>3. Develop plans for fire protection, detection and extinction</p>	<ul style="list-style-type: none"> a. Plans of action for fire protection, detection and extinction are developed by the vessel's management team in accordance with regulatory requirements, marine fire control practice and company procedures b. Plans for fire protection, detection and extinction are documented in accordance with company procedures and regulatory requirements c. Appropriate resources are organised in readiness for possible deployment should there be a fire on board the vessel during an emergency d. Fire control drills are carried out at appropriate times to test the readiness of shipboard personnel to implement plans for fire protection, detection and extinction

<p>4. Develop procedures for the use of various life-saving appliances</p>	<ul style="list-style-type: none"> a. Procedures for the use of various shipboard life-saving appliances are developed by the vessel's management team in accordance with regulatory requirements, manufacturer's instructions and company procedures b. Procedures for the use of various life-saving appliances are documented in accordance with company procedures and regulatory requirements c. Instruction is organised for shipboard personnel in the correct use of life-saving appliances d. Life saving drills are carried out at appropriate times to test the readiness of shipboard personnel to correctly carry out life-saving procedures and use life-saving appliances
<p>5. Coordinate the implementation of emergency response plans</p>	<ul style="list-style-type: none"> a. Information on emergency response plans is distributed and made available to shipboard personnel via noticeboards, pamphlets and documented instructions b. Appropriate instruction is organised for shipboard personnel in their roles and responsibilities during various types of shipboard emergencies c. Appropriate emergency drills are carried out at appropriate times to test the readiness of shipboard personnel to correctly carry out various emergency response plans d. Appropriate alarms and directions are given when a shipboard emergency is detected e. Action in dealing with an emergency is coordinated in accordance with the emergency response plan, regulatory requirements and company procedures f. Details of a shipboard emergency and the action taken is documented in accordance with regulatory requirements and company procedures

Range Of Variables

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations, conventions and codes. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in planning for and coordinating shipboard emergencies. c. Work involves the application of a significant range of fundamental marine emergency principles, practices and procedures across a wide and often unpredictable variety of shipboard emergencies. Contribution to the development of shipboard emergency response plans is required. Accountability and responsibility for self and others in preparing for the possible implementation of emergency plans is involved. d. The Master has ultimate responsibility within the vessel's management team for the development and implementation of emergency control plans and responses. The Chief Engineer is responsible for the management, development and implementation of the machinery space emergency control plans. e. Work requires significant judgement in planning, technical and leadership functions related to the development and coordination of emergency procedures onboard vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Plans for emergency response may include: <ul style="list-style-type: none"> b.1. defining the roles and responsibilities of shipboard personnel during the emergency b.2. establishment of a chain of command b.3. details of the sequence of action to be taken during the type(s) of emergency concerned b.4. damage assessment procedures b.5. damage control measures b.6. resources deployment procedures including use of day-to-day items b.7. communications strategy b.8. life saving procedures b.9. abandon vessel procedures where required c. Potential emergencies may occur: <ul style="list-style-type: none"> c.1. by day or night c.2. under any possible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring d. Emergencies may include: <ul style="list-style-type: none"> d.1. collision with another vessel d.2. explosion on board a vessel d.3. fire on board a vessel d.4. impairment of integrity of hull d.5. loss of steering control d.6. loss of motive power d.7. grounding d.8. beaching a vessel d.9. person overboard d.10. rescue and evacuation of injured personnel e. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> e.1. use of softwood wedges and plugs to reduce water ingress e.2. erection and application of vertical shoring e.3. construction and fitting of a leak-stopping mat e.4. temporary repair of a ruptured pressurised pipe e.5. operation of a portable salvage pump f. Damage control measures in a fire or explosion emergency may include: <ul style="list-style-type: none"> f.1. use of appropriate fire fighting equipment and techniques such as various types of fire extinguishers, fire blankets, fire hoses and nozzles, and foam applicators f.2. activation of fixed fire fighting sprinklers and systems f.3. removal of fuel or heat source f.4. boundary cooling techniques

Range Of Variables (continued)

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

VARIABLE	SCOPE
2. Worksite environment (continued)	g. Survival equipment may include: g.1. life jackets g.2. exposure suits g.3. immersion suits g.4. survival craft
3. Sources of information / documents	a. Documentation / records may include a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO Conventions and Codes a.5. AMSA Marine Orders a.6. vessel's log a.7. company emergency procedures a.8. vessel manufacturer's instructions and recommended procedures for damage control measures a.9. instructions of relevant Maritime Authorities a.10. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. relevant sections of the IMO Codes and Conventions and AMSA Marine Orders a.2. International Regulations for Preventing Collisions at Sea a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Prepare contingency plans for emergency response a.2. Develop plans for damage control following a shipboard emergency a.3. Develop plans for fire protection, detection and extinction on board a vessel a.4. Develop procedures for the use of various life-saving appliances a.5. Identify typical problems that may occur during a shipboard emergency and take appropriate action a.6. Communicate effectively with others during shipboard emergencies a.7. Document emergency response plans a.8. Prepare shipboard personnel to implement emergency response plans if required
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other relevant mandatory units that form part of a job role of a master or engineer officer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of the IMO Conventions and Codes and AMSA Marine Orders as they relate to damage control during shipboard emergencies b. ISM Code safety management system plans, procedures, checklists and instructions c. Relevant OH&S legislation, codes of practice, policies and procedures d. Requirements for emergency response contingency plans as per international regulations, AMSA Marine Orders and company policy e. Potential navigational emergencies for vessels and appropriate action and solutions f. General principles of damage control and the manner in which water-tight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair g. The concept of reserve buoyancy and its relevance to damage control on board vessels h. Statutory requirements pertaining to damage control in vessels i. Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvas and clothing j. Maritime communication techniques used during navigational emergencies k. Mandatory knowledge and skills in personal survival techniques, fire fighting and fire prevention required of all seafarers, as per Section A VI/1 of the IMO STCW 95 Code
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to develop emergency response plans and handle emergency situations on board vessels, and/or b. develop or improve emergency response plans on board an operational commercial vessel

Evidence Guide (continued)

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 developing emergency response plans and handling emergencies a.2 identifying and evaluating problems that may occur during a shipboard emergency and determining appropriate courses of action a.3 identifying and implementing improvements to emergency response plans a.4 applying safety and life-saving precautions and procedures during emergency situations on board a vessel a.5 preparing shipboard personnel to implement emergency response plans <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO Conventions and Codes and AMSA Marine Orders b.2 ISM Code and associated ship's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 issue resolution procedures b.5 job procedures and work instructions b.6 relevant regulations relating to shipboard emergencies and damage control b.7 environmental protection during emergencies <p>c. Action taken promptly to report and/or rectify shipboard emergencies in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3	1	2	2

TDM MF6 01A ORGANISE AND MANAGE THE PROVISION OF MEDICAL CARE ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to organise and manage the provision of medical care on board a commercial vessel in accordance with procedures as specified in the publications: (1) 'International Medical Guide for Ships', (2) Medical Section of the 'International Code of Signals' and (3) 'Medical First Aid Guide for Use in Accidents involving Dangerous Goods'. This includes taking charge of a medical emergency on board a vessel, seeking assistance from shore-based medical advisers and carrying out medical procedures as directed from shore-based medical advisers.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2

ELEMENT	PERFORMANCE CRITERIA
1. Take charge of a medical emergency on board a vessel	<ul style="list-style-type: none"> a. Medical emergencies and injuries are identified and assessed correctly b. Correct management procedures are implemented for the type of medical emergency or injury identified c. Resuscitation techniques are correctly applied when required
2. Provide routine medical care on board a vessel.	<ul style="list-style-type: none"> a. Routine medical procedures are carried out in accordance with regulatory requirements and company procedures b. Health and hygiene education is provided to crew and passengers as required by health authorities and company procedures c. Diagnosis and management of injuries, infectious and sexually transmitted diseases, and cardiovascular and central nervous system disorders are carried out in accordance with regulatory requirements and company and prescribed medical procedures d. Health precautions and disease prevention measures are implemented in accordance with regulatory requirements and company procedures
3. Seek assistance from shore-based medical advisers	<ul style="list-style-type: none"> a. Correct procedures are used to access radio medical advice when necessary to manage a medical emergency on board a vessel b. Protocols required when seeking radio medical advice for accident and injury are followed
4. Carry out medical procedures as directed from shore-based medical advisers	<ul style="list-style-type: none"> a. A patient health assessment is carried out as required b. Aseptic techniques are applied during wound dressing, suturing and injection procedures c. Symptoms, signs and descriptions of assessments made of a patient's condition are relayed to the shore-based adviser d. Medical procedures are carried out as directed by the shore-based advisers e. Advice from shore-based advisers is complemented by reference to relevant marine publications on medical care on board a vessel

<p>5. Perform quarantine procedures when entering port from overseas</p>	<ul style="list-style-type: none"> a. Signs and symptoms of notifiable diseases are reported to quarantine authorities b. Items that must be declared to quarantine authorities are listed as required c. A deratting or deratting exemption certificate is sought as required d. Procedures for protection against transmission of disease and the control of epidemics are applied as required e. Vessel's garbage is stored and disposed of in port in accordance with regulatory requirements f. Strategies for reducing the potential effects of contaminated ballast water are implemented
<p>6. Perform basic nursing activities</p>	<ul style="list-style-type: none"> a. The position of the patient is adjusted to optimise personal comfort for the medical condition or injury concerned b. Hygiene measures are used that are appropriate for the degree of illness or injury c. Condition of the patient is regularly monitored both visually and through appropriate measures of bodily signs d. Appropriate action is taken if there are signs of a deterioration in the condition of the patient
<p>7. Maintain medical records.</p>	<ul style="list-style-type: none"> a. Medical records are kept in accordance with regulatory requirements and company procedures

Range Of Variables

ORGANISE AND MANAGE THE PROVISION OF MEDICAL CARE ON BOARD VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations and rules dealing with medical care on board a vessel. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a knowledge of first aid and medical techniques required to provide medical care for crew and/or passengers on board a vessel. Contribution to the planning and organisation of medical care on board a vessel is required. Accountability and responsibility for self and others in providing medical care is involved. d. Work requires significant judgement in planning and leadership functions related to the provision of medical care for crew and/or passengers on board vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial Australian or international vessel of 500 gross tonnage or more b. Medical care and procedures may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway or at anchor b.4. during quarantine procedures when entering port c. Medical emergencies may include: <ul style="list-style-type: none"> c.1. acute chest pain c.2. acute respiratory conditions c.3. acute abdominal pain c.4. diabetes c.5. seizures d. Management of injuries on board vessel may include: <ul style="list-style-type: none"> d.1. head injuries d.2. chest injuries d.3. haemorrhage d.4. shock d.5. spinal injuries d.6. fractures and dislocations d.7. cold injury and hypothermia d.8. Inhalation, ingestion and skin or eye contact with industrial chemicals e. Diagnosis and management of infectious diseases may include: <ul style="list-style-type: none"> e.1. typhoid e.2. cholera e.3. dysentery e.4. malaria e.5. heat exhaustion e.6. influenza e.7. pneumonia e.8. tonsillitis e.9. meningitis e.10. inguinal hernia f. Diagnosis and management of cardiovascular and central nervous system disorders may include: <ul style="list-style-type: none"> f.1. angina pectoris f.2. coronary occlusion f.3. paroxysmal tachycardia f.4. facial palsy f.5. cerebral haemorrhage f.6. cerebral thrombosis

Range Of Variables (continued)

ORGANISE AND MANAGE THE PROVISION OF MEDICAL CARE ON BOARD A VESSEL

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>g. Diagnosis and management of sexually transmitted diseases may include:</p> <ul style="list-style-type: none"> g.1. urethral and urine smear tests g.2. basic medical treatment for various sexually transmitted diseases g.3. counselling <p>h. Measures for the prevention of disease in seafarers may include:</p> <ul style="list-style-type: none"> h.1. immunisation and vaccination h.2. methods for the prevention of malaria h.3. precautions to be taken when in endemic zones for malaria and yellow fever h.4. precautions and methods for the prevention of disease spread on board a vessel
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. IMO STCW Convention and Code dealing with medical care on board a vessel a.3. AMSA Marine Orders dealing with medical care on board a vessel a.4. The Ship Captain's Medical Guide a.5. International Medical Guide for Ships a.6. Medical Section of the 'International Code of Signals' a.7. Medical First Aid Guide for Use in Accidents involving Dangerous Goods a.8. Marine Drug Guide a.9. vessel's log a.10. vessel medical records a.11. shipboard patients' health records a.12. drug register a.13. quarantine records and documentation a.14. company procedures concerning medical care on board a vessel a.15. instructions of relevant maritime, health and quarantine authorities related to the medical care of crew and passengers on board a vessel a.16. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. ISM Code Safety Management System a.4. relevant international, Australian and State/Territory health and quarantine regulations a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ORGANISE AND MANAGE THE PROVISION OF MEDICAL CARE ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Take charge of typical medical emergencies on board a vessel a.2. Carry out routine medical procedures on board a vessel a.3. Carry out medical procedures as directed from shore-based medical advisers a.4. Identify typical medical problems and emergencies and take appropriate action a.5. Educate passengers and crew on shipboard health and hygiene a.6. Complete quarantine requirements when entering a port from overseas a.7. Communicate effectively with others during medical emergencies and health care a.8. Maintain medical records in accordance with company and regulatory requirements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a commercial vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant maritime regulations related to medical care on board a vessel b. Emergencies, injuries and medical problems that may occur on board a vessel and appropriate action, treatments and solutions c. Relevant OH&S and health legislation and policies d. Shipboard procedures for: <ul style="list-style-type: none"> d.1. conducting an initial patient assessment d.2. managing injuries d.3. managing medical emergencies d.4. carrying out resuscitation techniques d.5. treating infectious diseases d.6. treating of commonly encountered industrial related medical conditions d.7. caring for eyes, ear, nose, rehydration and urinary retention d.8. managing surgical emergencies d.9. managing drug and alcohol abuse d.10. treating disorders of the central nervous system and cardiovascular diseases d.11. caring for dying or dead persons d.12. managing sexually transmitted diseases d.13. shipboard hygiene and health education d.14. implementing quarantine regulations d.15. administering drugs and subcutaneous and intramuscular injections within legal and practical guidelines e. Suturing techniques as per the Ship Captain's Medical Guide f. Techniques for care of wounds g. Quarantine procedures when entering a port from overseas h. Potential dangers associated with contaminated ballast water i. Precautions for the prevention of disease in seafarers j. Ways in which disease can spread on board a vessel and ways of preventing the spread k. Principles of shipboard hygiene including adequate ventilation, healthy lifestyle, disinfection of potable water, food hygiene, and disposal of liquid and solid waste from a vessel l. Legal issues surrounding drug administration on board a vessel m. Knowledge of body structures and functions relevant to possible injury and disease that may be encountered on board a vessel n. Maritime communication techniques related to health care and receiving radio medical advice from shore-based advisers o. Duties and responsibilities of the designated medical officer on board a vessel p. Marine publications containing information on first aid and medical treatment on board a vessel

Evidence Guide (continued)

ORGANISE AND MANAGE THE PROVISION OF MEDICAL CARE ON BOARD A VESSEL

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to manage and coordinate the medical care of crew and passengers on board vessels of 500 gross tonnage or more, and/or b. assist in the coordination of medical care procedures on board an operational vessel
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 providing medical care on board a vessel a.2 identifying and evaluating medical problems and emergencies and taking appropriate courses of action a.3 identifying and implementing improvements to medical care on board a vessel a.4 applying aseptic and other precautionary techniques when carrying out medical procedures on board a vessel a.5 assessing operational capability of vessel and manoeuvring plant and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and medical care policies and procedures b.4 issue resolution procedures b.5 relevant medical and first aid instructions b.6 shipboard safety procedures c. Action taken promptly to report and/or rectify injuries and medical incidents in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3

TMT MF7 01A OBSERVE SAFE WORKING PRACTICES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to implement regulatory requirements for occupational health and safety on board a commercial vessel, including following and applying established maritime safe working practices and procedures and hazard control strategies.

The unit is consistent with the related functional standard in Section A VI/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers. It covers the National Occupational Health and Safety Commission Generic Competency A and is equivalent to the Seafood Industry competency standard SFICORE104A Meet workplace health and safety requirements.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Identify and follow workplace procedures for hazard identification and risk control</p>	<ul style="list-style-type: none"> a. Safety regulations and established vessel's safety and hazard control practices and procedures are obtained, interpreted and applied to day-to-day work activities b. Workplace procedures for Occupational Health and Safety and related work instructions for controlling risks onboard a vessel are accurately followed c. Workplace procedures for dealing with shipboard accidents, fire and emergencies are known and followed d. Hazards in the workplace are identified and appropriate action is taken to report them and to minimise or eliminate risk to personnel, vessel and the environment e. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed f. Personal protection clothing and equipment is correctly used in accordance with established shipboard safety practices and procedures g. Appropriate assistance is provided in the event of a shipboard emergency to secure the vessel and its machinery and equipment and to maintain the safety of the vessel and persons involved h. Established emergency and contingency plans are followed in the event of a shipboard emergency
<p>2. Contribute to arrangements for the management of occupational health and safety</p>	<ul style="list-style-type: none"> a. Occupational Health and Safety issues and identified safety hazards are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation b. Contributions to occupational health and safety management in the workplace are made within workplace procedures and provisions of relevant legislation c. Occupational health and safety issues are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation. d. Contribute to participative arrangements for occupational health and safety management in the workplace within vessel's procedures and scope of responsibilities and competencies
<p>3. Complete Occupational Health and Safety records</p>	<ul style="list-style-type: none"> a. Occupational health and safety records for self are completed in accordance with workplace requirements b. Legal requirements for the maintenance of records of occupational injury and diseases are followed

Range Of Variables

OBSERVE SAFE WORKING PRACTICE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime and OHS regulations. b. Safe working practices and procedures and established hazard control strategies are correctly applied to day-to-day work either individually or in a team environment with some accountability for the safety of self and others. c. Day-to-day work involves the application of known and established safe working and hazard control practices and procedures across a variety of normal and emergency contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Work may be conducted in enclosed spaces, exposed conditions and controlled or open environment c. Safe working practices and hazard control strategies must be applied at all times including: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring c.6. when slipped or in dry-dock c.7. when bunkering c.8. during cargo operations d. Emergencies may include: <ul style="list-style-type: none"> d.1. loss of propulsion d.2. loss of electrical power d.3. loss of steerage d.4. flooding of vessel d.5. fire or explosion d.6. loss of refrigeration d.7. loss of water making ability d.8. fuel oil, lubrication oil, steam and gas leaks d.9. overheating and overspeed of machinery, governors, emergency trips e. Workplace hazards may include: <ul style="list-style-type: none"> e.1. moving heavy loads in an unsafe work environment e.2. unsecure machinery, components or repair equipment e.3. slippery deck e.4. welding equipment e.5. sharp tools and implements e.6. power tools e.7. moving and rotating machinery e.8. flammable liquids, vapours and fuel e.9. faulty machinery equipment handling equipment and lifting gear e.10. using equipment beyond safe working limits e.11. poor housekeeping procedures e.12. non-compliance with safe working procedures e.13. electrical wiring and systems e.14. hot pipes and valves (steam, fuel oil, lubricating oil) e.15. cold pipes and valves (refrigeration and liquefied gas cargoes) e.16. working at heights e.17. exposed electrical circuits e.18. toxic gases and substances e.19. chemicals and other harmful substances e.20. damaged cargo and containers f. Personnel in work area may include vessel's officers and crew, passengers, contractors, official representatives g. Hazard identification may include activities associated with: <ul style="list-style-type: none"> g.1. checking equipment or the work area before work commences and during work g.2. workplace inspections g.3. housekeeping

Range Of Variables (continued)

OBSERVE SAFE WORKING PRACTICE

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>h. Participative arrangements may include:</p> <ul style="list-style-type: none"> h.1. formal and informal meetings which include occupational health and safety h.2. occupational health and safety committees h.3. other committees, for example, consultative, planning and purchasing h.4. health and safety representatives h.5. suggestions, requests, reports and concerns put forward by vessel's crew to senior officers <p>i. Designated personnel may include:</p> <ul style="list-style-type: none"> i.1. senior officers i.2. team leaders i.3. management occupational health and safety personnel i.4. other persons authorised or nominated by the company or senior officers to: <ul style="list-style-type: none"> i.4.1. perform specified work, i.4.2. approve specified work, i.4.3. inspect specified work, and i.4.4. direct specified work.
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions, (where applicable) a.2. vessel and company's safety management policies, emergency contingency plans and procedures a.3. records required under OHS legislation, for example: <ul style="list-style-type: none"> a.3.1. worker's compensation and rehabilitation records a.3.2. hazardous substances registers a.3.3. Material Safety Data Sheets a.3.4. major accident/injury notifications and a.3.5. certificates and licences a.4. manufacturers and suppliers OHS information a.5. OHS audits and inspection reports a.6. maintenance and testing reports a.7. workplace environmental monitoring and health surveillance records a.8. records of instruction and training and a.9. first aid / medical post records.
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of national and international maritime regulations dealing with OHS in shipboard workplaces a.2. relevant international, Australian and State/Territory OH&S legislation, particularly: <ul style="list-style-type: none"> a.2.1. OHS Acts, regulations and codes of practice, including regulations and codes of practice relating to hazards present in the workplace or industry; a.2.2. general duty of care under OHS legislation and common law; a.2.3. requirements for the maintenance and confidentiality of records of occupational injury and disease; a.2.4. requirements for provision of OHS information and training; a.2.5. provisions relating to roles and responsibilities of health and safety representatives and/or OHS committees a.2.6. provisions relating to OHS issue resolution.

Evidence Guide

OBSERVE SAFE WORKING PRACTICE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Identify and follow workplace procedures for hazard identification and risk control a.2. Contribute to arrangements for the management of OHS onboard a vessel a.3. Complete OHS records as required a.4. Communicate effectively with others on workplace safety matters
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime and OHS regulations b. ISM Code Safety Management System procedures (where applicable) c. The provisions of OHS Acts, regulations and codes of practice relevant to the workplace, including the rights and responsibilities of the workplace parties under OHS Acts, regulations and codes of practice; d. The ways in which OHS is managed in the workplace, and activities required under OHS legislation, for example: <ul style="list-style-type: none"> d.1. policies d.2. procedures d.3. plant and equipment maintenance d.4. hazard identification d.5. risk assessment and control d.6. OHS instruction d.7. training and provision of OHS information e. Hazards that exist in the workplace f. The preferred order of ways to control risks (known as the hierarchy of control); g. Workplace OHS procedures relevant to the work being undertaken, including procedures for: <ul style="list-style-type: none"> g.1. recognising and reporting on hazards, for example, work area inspections g.2. work operations to control risks, for example, permit to work systems and isolation procedures g.3. responding to accidents, fires and emergencies g.4. raising OHS issues g.5. employee participation in OHS management, for example, consultative or OHS committees and joint employer/employee inspections h. The meaning of OHS symbols found on signs and labels in the workplace i. Designated personnel responsible for OHS onboard a vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to contribute to the application of safe working practices and safety hazard control onboard a vessel; and/or b. Contribute to the application of safe working practices and hazard control and safety hazard control on a commercial or training vessel

Evidence Guide (continued)

OBSERVE SAFE WORKING PRACTICE

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. identifying and following workplace procedures for hazard identification and risk control a.2. contributing to arrangements for the management of OHS onboard a vessel a.3. completing OHS records as required a.4. communicating effectively with others on workplace safety matters <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. ISM Code and associated vessel's Safety Management System and procedures (where applicable) b.3. OHS regulations and hazard prevention policies and procedures b.4. on-board housekeeping processes b.5. waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify hazards, safety risks and safety incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	1

TDM MF8 01A COMPLY WITH EMERGENCY PROCEDURES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to take appropriate initial action on becoming aware of an emergency on board a commercial vessel and to follow established emergency response procedures.

The unit is consistent with the related functional standard in Section A VI/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Take action on becoming aware of an emergency</p>	<p>a. Emergency situations are correctly recognised and identified</p> <p>b. Response to an emergency situation follows established vessel's emergency response procedures</p> <p>c. Correct action is taken on discovery of an actual or potential emergency in accordance with established vessel procedures</p> <p>d. Information given on raising alarm is prompt, accurate, complete and clear</p>
<p>2. Follow established emergency procedures</p>	<p>a. Vessel's contingency plans for emergency response are known and are implemented in real and simulated emergency situations</p> <p>b. Escape routes and internal and external communications and alarm systems are correctly used in real and simulated emergency situations in accordance with regulatory requirements and established procedures</p> <p>c. Emergency communications and alarm signals and systems are understood and required action implemented in accordance with emergency procedures and regulatory requirements</p> <p>d. Planned damage control procedures for dealing with damage to the vessel and its hull are implemented in accordance with company procedures and regulatory requirements</p>
<p>3. Follow procedures for the use of various life-saving appliances</p>	<p>a. Participation in life saving drills confirms readiness to correctly carry out life-saving procedures and use life-saving appliances</p> <p>b. Procedures for the use of various shipboard life-saving appliances are followed in accordance with regulatory requirements, manufacturer's instructions and company procedures</p>

Range Of Variables

COMPLY WITH EMERGENCY PROCEDURES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Responses to emergency situations follow a prescribed range of emergency procedures either individually or in a team environment with some accountability for the quality of outcomes. c. Responses involve the use of known and defined emergency systems and procedures across a variety of emergency contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Potential emergencies may occur: <ul style="list-style-type: none"> b.1. by day or night b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when bunkering b.7. during cargo handling operations c. Emergencies may include: <ul style="list-style-type: none"> c.1. collision with another vessel c.2. explosion on board vessel c.3. fire on board vessel c.4. impairment of integrity of hull and ingress of water c.5. loss of steering control c.6. loss of motive power c.7. foundering c.8. grounding c.9. beaching a vessel c.10. person overboard c.11. rescue and evacuation of injured personnel d. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> d.1. use of softwood wedges and plugs to reduce water ingress d.2. erection and application of vertical shoring d.3. construction and fitting of a leak-stopping mat d.4. temporary repair of a ruptured pressurised pipe d.5. operation of a portable salvage pump e. Damage control measures in a fire or explosion emergency may include: <ul style="list-style-type: none"> e.1. use of appropriate fire fighting equipment and techniques such as various types of fire extinguishers, fire blankets, fire hoses and nozzles, and foam applicators e.2. activation of fixed fire fighting sprinklers and systems e.3. removal of fuel or heat source e.4. boundary cooling techniques f. Survival equipment may include: <ul style="list-style-type: none"> f.1. life jackets f.2. exposure and immersion suits f.3. survival craft
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. SOLAS Convention a.3. vessel's emergency response procedures a.4. emergency procedures a.5. vessel manufacturer's instructions and recommended procedures for damage control measures a.6. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of the Australian USL Code a.3. relevant sections of AMSA Marine Orders a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

COMPLY WITH EMERGENCY PROCEDURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Take appropriate action in the event of discovering a shipboard emergency a.2. Follow vessel's contingency plans for emergency response a.3. Follow procedures for the use of various life-saving appliances a.4. Implement damage control following a shipboard emergency in accordance with instructions a.5. Identify typical problems that may occur during a shipboard emergency and take appropriate action a.6. Communicate effectively with others during shipboard emergencies a.7. Participate in drills to prepare shipboard personnel to implement emergency response
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Navigational emergencies for vessels and appropriate action and solutions d. Indications of various types of emergency situations and the action to be followed when various types of actual or potential emergency situations are identified e. Emergency alarm signals and systems in use on vessels and procedures to be followed when an emergency alarm is raised f. Escape routes and internal and external communications systems and alarms on board a vessel g. General principles of damage control and the manner in which watertight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair h. Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvas and clothing i. Maritime communication techniques used during navigational emergencies
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to respond to emergency situations onboard a commercial vessel, and/or b. follow emergency response plans and procedures during real and simulated emergency situations on board an operational commercial vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 taking initial action during real and simulated emergency situation a.2 implementing emergency during a real and simulated emergency situations a.3 identifying and evaluating problems that may occur during a shipboard emergency and determining appropriate courses of action a.4 applying safety and life-saving precautions and procedures during emergency situations on board vessel a.5 participating in drills aimed at preparing shipboard personnel to implement emergency response plans b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 relevant procedures and regulations relating to shipboard emergencies and damage control b.4 shipboard safety procedures b.5 environmental protection during emergencies c. Action taken promptly to report and/or rectify shipboard emergencies in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

COMPLY WITH EMERGENCY PROCEDURES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	1	1

TDM MF9 01A FIGHT AND EXTINGUISH FIRES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to fight and extinguish fires onboard a commercial vessel.

The unit is consistent with the related functional standard in Section A VII/1-2 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 4, and the Australian USL Code. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
1. Operate portable fire-fighting equipment	<ul style="list-style-type: none"> a. A, B and C classes of fires are correctly identified in accordance with accepted fire-fighting practice b. Correct portable fire-fighting equipment is selected and used to fight specific classes of fires c. Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice d. Correct techniques are applied for the use of hose lines to extinguish fires on board a vessel e. Where applicable, correct techniques are applied for the setting up of foam making equipment to extinguish B Class fires on board a vessel
2. Recharge portable fire extinguishers (where applicable)	<ul style="list-style-type: none"> a. Where applicable, correct techniques are used to recharge the various types of portable fire extinguisher b. Portable fire-fighting equipment is confirmed as operational following recharging
3. Carry out fire-fighting operations	<ul style="list-style-type: none"> a. Correct procedures and techniques are followed when fighting fires in simulated or real fire emergencies b. Safety clothing, appliances and equipment are appropriate to the nature of the fire-fighting operations c. Extinguishment of a fire is achieved using appropriate procedures, techniques, equipment and fire-fighting agents d. Correct portable fire-extinguisher(s) are selected and used for the class of fire involved in a fire emergency e. Appropriate safety precautions and procedures are applied when fighting fires in accordance with regulatory requirements, vessel's procedures and established fire-fighting practice f. The timing and sequence of individual actions when fighting fires onboard a vessel are appropriate to the prevailing circumstances and conditions g. Procedures for donning and starting up self-contained breathing apparatus (SCBA) are correctly applied h. Procedures for the logging of SCBA operators on a BA Control Board is correctly followed in accordance with vessel's procedures and accepted fire-fighting practice i. Search and rescue operations in a smoke filled environment are correctly conducted as a member of a fire-fighting team in accordance with accepted fire-fighting practice j. Interior fires are extinguished using appropriate fire fighting equipment and procedures as a member of a fire-fighting team in accordance with accepted fire-fighting practice k. Lifeline signals are correctly used during interior fire-fighting operations l. A compartment filled with high expansion foam is correctly entered as per accepted fire-fighting practice

Range Of Variables

FIGHT AND EXTINGUISH FIRES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed as a member of a team within defined fire-fighting situations, with some responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of prescribed principles and practice to the prevention and fighting of fires on board a vessel. Participation as a member of a fire-fighting team is involved. d. Work requires some judgement and teamwork in the execution of prescribed procedures for the fighting of fires that may occur onboard a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Fires on board a vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of fires which may occur on board a vessel include Classes A, B, C and F in the standard classification of fires d. Fire-fighting equipment, appliances and systems may include: <ul style="list-style-type: none"> d.1. portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam d.2. fire blankets d.3. CO₂ fixed systems d.4. foam installations including semi-portable and fixed systems d.5. sprinkler systems d.6. fire pumps (main and emergency fire pump) d.7. fire hoses, hydrants, branches and international shore connection e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. fire-resistant clothing e.2. self-contained breathing apparatus (SCBA) e.3. masks e.4. eye and ear protection e.5. gloves e.6. boots f. Consumable materials and items that may used in fire detection and fire fighting equipment may include: <ul style="list-style-type: none"> f.1. Dry and wet chemicals used in fire extinguishers f.2. Batteries for fire detectors
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Relevant maritime regulations a.2. fire-fighting and safety equipment operational and maintenance instructions and recommended procedures a.3. instructions of relevant Maritime Authorities related to the maintenance and serviceability of ship-board fire- fighting and safety equipment and systems a.4.
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. the Australian USL Code a.4. international regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

FIGHT AND EXTINGUISH FIRES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Participate in simulated on-board fire-fighting activities a.2. Participate in search and rescue and fire-fighting teams a.3. Implement OHS principles and policies when carrying out fire-fighting duties a.4. Communicate effectively with others as required during fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. ISM Code and associated ship's Safety Management System and procedures, where relevant c. The chemistry of fire and its relationship to materials typically carried on vessels d. Principles underlying the spread of fire and its extinguishment e. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment f. Principles and procedures for the use of self-contained breathing apparatus (SCBA) when fighting fires g. Fire-fighting clothing, outfits and personal safety equipment used when fighting a fire onboard a vessel h. Types fire-fighting appliances, equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance i. Fixed fire prevention and extinguishing installations used on vessels and their principles of operation j. Fire-fighting techniques, agents and precautions applicable to different classes of fire on board a vessel k. Maritime communication techniques applicable to fire-fighting activities onboard a vessel l. Typical problems that can occur with shipboard fire-fighting equipment and operations and appropriate remedial action and solutions m. Sources of information on shipboard fire prevention and extinguishment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire fighting activities on board a vessel, and/or b. assist in fire-fighting drills on board an operational vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards. Simulated conditions should provide truly realistic simulated shipboard conditions including, where practical, conduct of activities in darkness.</p>

Evidence Guide (continued)

FIGHT AND EXTINGUISH FIRES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 implementing the implementation of fire prevention measures and procedures a.2 identifying and evaluating fire fighting problems and determining appropriate courses of action a.3 participating as a member of an interior search and rescue and fire-fighting team on board a vessel a.4 assessing the operational capability of fire- fighting appliances, equipment and systems and taking any required maintenance or replenishment action <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code Safety Management System procedures, where applicable b.3 OHS regulations and hazard prevention policies and procedures b.4 relevant manufacturer's guidelines relating to the use of fire-detection and fire- fighting equipment and systems, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes and fire-hazard prevention measures b.6 fire prevention procedures and policies <p>c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection and fire-fighting, equipment and systems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	3	1	1	2

TDM MF10 01A PROVIDE FIRST AID

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to provide basic first aid on board a vessel, including the performance of immediate life saving first aid until qualified medical assistance is available; the recognition of the symptoms and signs of acute illness and / or injury and the taking of appropriate action; the correct management of wounds and bleeding, burns, and bone and muscle injuries; and the adaptation of First Aid procedures for remote situations. (The unit is consistent with competency requirements set for the 'St John Ambulance National Senior Level First Aid Certificate' or 'Level 2 First Aid Certificate'.)

(Note that this unit may be replaced with the generic First Aid Unit currently being developed by the Health and Community Services Industry Training Advisory Board when endorsed)

The unit is consistent with the basic first aid requirements specified in the AMSA Marine orders and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Perform immediate life saving first aid pending the arrival of medical assistance</p>	<ul style="list-style-type: none"> a. The priorities of First Aid Care are correctly applied in a real or simulated first aid situation b. The DRABC Action plan is correctly used to identify and control danger, loss of consciousness, loss of airway, breathing and circulation c. An unconscious casualty is correctly placed in stable side position and the steps in clearing the airways to promote breathing in accordance with established first aid procedures d. The correct method of Expired Air Resuscitation (EAR), External Cardiac Compression (ECC) and Cardio Pulmonary Resuscitation (CPR) is applied in a real life resuscitation situation, or in a simulated exercise using a manikin
<p>2. Recognise the symptoms and signs of acute illness and / or injury and take appropriate action</p>	<ul style="list-style-type: none"> a. The symptoms and signs of the most common causes of unconsciousness are correctly identified b. A real or simulated unconscious casualty is cared for in accordance with established first aid procedures c. Causes of respiratory failure and breathing difficulty are correctly identified and appropriate care is provided for a real or simulated casualty with obstructed breathing d. The symptoms and signs of a casualty with angina pain, heart attack and heart failure are correctly identified e. Symptoms and signs of acute abdominal and pelvic injury are correctly identified and appropriate immediate first aid treatment of these conditions is provided in a real or simulated situation f. Facial, ear and eye injuries in a real or simulated first aid situation are correctly managed in accordance with established first aid procedures g. The symptoms and signs of poisoning, bites and stings are correctly identified and appropriate immediate management of these conditions is provided in a real or simulated situation h. A real or simulated conscious casualty with an acute illness and/or injury is cared for in accordance with established first aid procedures

<p>3. Manage wounds and bleeding</p>	<ul style="list-style-type: none"> a. Severe external bleeding is correctly controlled in a real or simulated situation b. The symptoms and signs of severe internal bleeding are correctly identified and appropriate immediate management of these conditions is provided in a real or simulated situation c. The symptoms and signs of shock as a result of severe injury are correctly identified and appropriate immediate management of shock is provided in a real or simulated situation d. A real or simulated laceration, abrasion and a deep puncture wound is correctly managed in accordance with established procedures e. The signs of wound infection are correctly identified and a real or simulated wound infection is correctly managed in accordance with established procedures
<p>4. Manage burns</p>	<ul style="list-style-type: none"> a. Immediate rescue procedures are correctly used in real or simulated first aid situations involving a burned casualty b. The severity of a burn is correctly assessed in terms of depth, position and size in accordance with established first aid procedures c. The correct method of treatment for burns and associated shock is correctly applied in real or simulated first aid situations involving a burned casualty
<p>5. Manage bone, joint and muscle injuries</p>	<ul style="list-style-type: none"> a. Symptoms and signs of fractures (simple and complicated), are correctly recognised in accordance with established first aid procedures b. Problems and treatment associated with dislocated joints are correctly managed in accordance with established first aid procedures c. First aid treatment of pelvic and chest injuries and fractures of limbs, including immobilisation techniques is correctly performed in accordance with established procedures d. A real or simulated casualty with suspected head, neck and back injuries is correctly cared for in accordance with established first aid procedures e. The symptoms and signs of sprains and strains are correctly identified in accordance with established first aid procedures f. The R.I.C.E. method of treatment of sprains and strains is correctly used in real or simulated first aid situations involving sprains and strains
<p>6. Adapt First Aid procedures for remote situations</p>	<ul style="list-style-type: none"> a. Safety precautions needed to prevent accidents, illness and injuries and infection in remote area situations are correctly applied in real or simulated situations b. Identify and discuss the factors involved in the prevention of heat and cold exposure. c. The symptoms and signs of a real or simulated casualty exposed to heat or cold are correctly identified including hyperthermia and hypothermia and appropriate management of the casualty carried out in accordance with established first aid procedures d. A real or simulated ill or injured person in remote conditions is correctly cared for until help arrives, including the monitoring of airway, breathing and heart beat, the control of pain, hydration and the maintenance of body temperature. e. A real or simulated casualty with 'severe injuries' in a remote situation is correctly cared for, including the preparation for transport f. First aid and emergency equipment required for remote area situations is correctly identified and used in real or simulated situations in accordance with established first aid procedures

Range Of Variables

PROVIDE FIRST AID

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations and established first aid procedures b. First aid is administered in accordance with established procedures pending the arrival of qualified medical assistance, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of a knowledge of the basic techniques required to provide first aid to crew and/or passengers during a real or simulated first aid situation on board a vessel. c. Work requires appropriate skill in recognising and confirming the nature and extent of injury or illness and the provision of first aid within the limits of responsibility of the person concerned. First aid may need to be provided in remote situations.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. First aid procedures may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and sea b.3. while underway b.4. when at anchor b.5. when moored c. First aid on board a vessel may need to be provided in situations involving: <ul style="list-style-type: none"> c.1. acute illness and/or injury c.2. laceration, abrasion and a deep puncture wounds c.3. respiratory failure and breathing difficulty c.4. shock as a result of severe injury c.5. abdominal, pelvic and chest injuries c.6. fractures of limbs c.7. poisoning, bites and stings c.8. sprains, strains and dislocations c.9. facial, ear and eye injuries c.10. suspected head, neck and back injuries d. Conditions requiring special first aid procedures may include: <ul style="list-style-type: none"> d.1. explosion injuries d.2. burns d.3. poisons and envenomation d.4. hypothermia and hyperthermia e. First aid resources may include: <ul style="list-style-type: none"> e.1. vessel's medicine cabinet e.2. first aid boxes e.3. emergency first aid carry bags e.4. specific first aid resources such as: <ul style="list-style-type: none"> e.4.1. roller bandages e.4.2. triangular bandages e.4.3. splints (improvisable) e.4.4. face shields e.4.5. face masks e.4.6. cleaning swabs e.4.7. cleaning brush e.4.8. cleaning solution e.4.9. non adhesive dressings
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Relevant sections of maritime regulations dealing with the administration of first aid on board a vessel a.2. <i>'Australian First Aid'</i>, The Authorised Manual of St John Ambulance Australia, (Melbourne) Australia .Latest Edition (or equivalent) a.3. company and vessel safety and first aid policy and procedures a.4. instructions of relevant maritime and health authorities related to the administration of first aid of crew and passengers on board a vessel

Range Of Variables (continued)

PROVIDE FIRST AID

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include: a.1. relevant sections of IMO STCW 95 Code and Convention concerning first aid requirements a.2. relevant sections of AMSA Marine Orders concerning first aid requirements a.3. relevant sections of the Australian USL Code concerning first aid requirements a.4. relevant regulations of State/Territory marine authorities dealing with first aid a.5. Australian and State/Territory OHS legislation

Evidence Guide

PROVIDE FIRST AID

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none">a. Assessment must confirm appropriate knowledge and skills to:<ul style="list-style-type: none">a.1. Perform immediate life saving first aida.2. Recognise the symptoms and signs of acute illness and / or injury and take appropriate actiona.3. Manage wounds and bleedinga.4. Manage burnsa.5. Manage bone, joint and muscle injuriesa.6. Adapt First Aid procedures for remote situationsa.7. Communicate effectively with others during provision of first aida.8. Report on first aid situations and activities in accordance with company and regulatory requirements
2. Interdependent assessment of units	<ul style="list-style-type: none">a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel).
3. Required knowledge and skills	<ul style="list-style-type: none">a. Sections of relevant maritime regulations dealing with first aid at seab. ISM Safety Management System procedures (where applicable) dealing with first aidc. First aid situations that may occur on board a vessel and appropriate first aid action, treatments and solutionsd. Relevant OH&S and health legislation and procedurese. The priorities of First Aid Caref. First aid duties and responsibilities of personnel on board a vesselg. Established first aid procedures consistent with 'St John Ambulance National Senior Level First Aid Certificate' or 'Level 2 First Aid Certificate'h. Shipboard first aid procedures for:<ul style="list-style-type: none">h.1. conducting an initial patient first aid assessmenth.2. managing injuriesh.3. carrying out resuscitation techniquesh.4. reporting on first aid situations and action takeni. Techniques for management and care of casualties in various first aid situations including:<ul style="list-style-type: none">i.1. acute illness and / or injuryi.2. wounds and bleedingi.3. burnsi.4. bone, joint and muscle injuriesj. Causes of respiratory failure and breathing difficultyk. The DRABC action plan for the identification and control of danger, loss of consciousness, loss of airway, breathing and circulationl. Correct methods of Expired Air Resuscitation (EAR), External Cardiac Compression (ECC) and Cardio Pulmonary Resuscitation (CPR)m. The symptoms and signs of:<ul style="list-style-type: none">m.1. the most common causes of unconsciousnessm.2. poisoning, bites and stingsm.3. sprains and strainsm.4. fractures (simple and complicated)m.5. dislocated jointsm.6. head, neck and back injuriesm.7. severe internal bleedingm.8. abdominal, pelvic and chest injuriesm.9. shock as a result of severe injurym.10. angina pain, heart attack and heart failurem.11. burns and associated shockn. The safety precautions needed to prevent accidents, illness and injuries and infection in remote area situationso. Knowledge of body structures and functions relevant to possible injury and illnesses that may be encountered on board a vesselp. Communication techniques related to the provision of first aidq. Marine publications containing information on first aid treatment on board a vessel

Evidence Guide (continued)

PROVIDE FIRST AID

<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to provide first aid to injured or ill crew and passengers, and/or b. assist in the real or simulated first aid procedures on board an operational vessel <p><i>Note:</i> Simulated first aid situations and assessments may require access to resuscitation manikins, auxiliary resuscitation items, disposable gloves, slings, water squeeze bottle or tap, roller bandages, triangular bandages, splints (improvisable), face shields, face masks, cleaning swabs, cleaning brush, cleaning solution, disposable lungs and airways, samples of non adhesive dressings, pictures of venomous animals/insects or preserved specimens, and blankets pillows and towels</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. performing immediate life saving first aid a.2. recognising the symptoms and signs of acute illness and / or injury and taking appropriate action a.3. managing wounds and bleeding a.4. managing burns a.5. managing bone, joint and muscle injuries a.6. adapting first aid procedures for remote situations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of maritime regulations dealing with first aid b.2. OHS regulations and first aid instructions and procedures b.3. vessel safety procedures c. Action taken promptly to report and/or manage injuries and first aid in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MF11 01A SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to survive at sea in the event of abandonment.

The unit is consistent with the relevant maritime regulations describing mandatory minimum requirements for familiarization and basic safety competence required for all seafarers. This includes relevant sections of the Australian USL Code, Section A VII/1-1 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Practice survival techniques</p>	<ul style="list-style-type: none"> a. The timing and sequence of individual survival actions are appropriate to the prevailing circumstances and conditions of the emergency and minimize potential dangers and threats to other survivors b. Initial actions when boarding survival craft enhance chance of survival c. Jumps safely from a height into the water in accordance with established survival practice d. Swims while wearing a lifejacket and floats without a lifejacket in accordance with established survival practice e. Inverted liferaft is righted while wearing a lifejacket in accordance with established survival practice f. Appropriate handling strategies are applied to manoeuvre survival craft in rough weather and sea conditions g. Sea anchors and drogues are deployed in accordance with accepted nautical practice h. Signs of hypothermia or other distress are identified and treated in accordance with accepted survival medical practice i. Exposure cover is deployed on an open lifeboat in accordance with accepted survival practice and manufacturer's instructions j. Rationing of food is in accordance with accepted survival practice
<p>2. Operate life saving and survival equipment</p>	<ul style="list-style-type: none"> a. Location and accessibility of life-saving and survival equipment is established b. Method of boarding survival craft is appropriate and avoids dangers to other survivors c. Survival equipment is operated in accordance with instructions and accepted survival practice d. Survival radio equipment is operated in accordance with manufacturer's instructions and regulatory protocols e. Immersion suit, various thermal protective aids, life-jacket and other life-saving clothing are correctly donned and used in accordance with instructions f.
<p>3. Participate in abandon vessel drills</p>	<ul style="list-style-type: none"> a. Abandon vessel musters and drills are attended in accordance with regulatory requirements and company procedures b. Action taken on identifying muster signals is appropriate to the indicated emergency and complies with established procedures c. Information is obtained and correctly interpreted on the use of life-saving equipment and procedures to be followed in the event of the order to abandon vessel

Range Of Variables

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Responses to abandon vessel alarms follow a prescribed range of survival procedures either individually or in a team environment with some accountability for the safety of self and others. This includes response to abandon vessel musters in both simulated and real emergency circumstances. c. Responses involve the use of known and defined survival procedures and techniques across a variety of maritime survival contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Emergencies that may lead to abandonment of vessel include: <ul style="list-style-type: none"> b.1. collision resulting in damage to the integrity of the vessel's hull b.2. fire b.3. foundering b.4. flooding of vessel's compartments c. Vessel abandonment may take place: <ul style="list-style-type: none"> c.1. by day or night c.2. under normal and adverse conditions of sea and weather c.3. while underway c.4. while hove to c.5. while anchored or moored c.6. in appropriately simulated situations d. Survival craft may include: <ul style="list-style-type: none"> d.1. free-fall life boats d.2. davit-launched life-boats d.3. life rafts d.4. rescue boats e. Life-saving and survival equipment may include: <ul style="list-style-type: none"> e.1. life jackets e.2. life buoys e.3. hard hats e.4. immersion suits and other thermal protective aids e.5. rocket line throwing appliances e.6. pyrotechnic distress signals e.7. GMDSS survival craft VHF radios e.8. satellite emergency position indicating radio beacons (EPIRBs) e.9. search and rescue transponders (SARTs) e.10. whistles f. Consumable materials and items that may used in life saving equipment may include: <ul style="list-style-type: none"> f.1. batteries for detectors, radios, beacons, etc. f.2. flares f.3. survival rations g. In-water survival techniques may include: <ul style="list-style-type: none"> g.1. swimming in a life-jacket g.2. towing with a life jacket g.3. remaining afloat without a life jacket g.4. donning a life jacket in water g.5. the group huddle g.6. heat escape lessening posture h. Threats to survival after abandoning vessel may include: <ul style="list-style-type: none"> h.1. cold water shock h.2. hypothermia h.3. psychological response to disaster h.4. loss of will to live h.5. sea sickness h.6. dehydration h.7. injuries h.8. starvation

Range Of Variables (continued)

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. Relevant maritime regulations a.2. SOLAS regulations a.3. AMSA publication 'Survival at Sea – a Training and Instruction Manual' a.4. instructions from official search and rescue authorities a.5. vessel's procedures for emergency response including abandoning vessel a.6. manufacturer's instructions for the use of survival craft and equipment a.7. instructions of relevant Maritime Authorities related to survival at sea a.8. relevant OH&S legislation, codes of practice, policies and procedures a.9. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. Relevant maritime regulations including: <ul style="list-style-type: none"> a.1.1. relevant sections of Australian Uniform Shipping Laws (USL) Code a.1.2. IMO STCW 95 Code and Convention dealing with survival at sea and use of survival craft and equipment a.1.3. relevant sections of AMSA Marine Orders dealing with survival at sea and use of survival craft and equipment a.2. Safety of Life at Sea (SOLAS) regulations a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Practice survival techniques in suitably simulated situations a.2. Operate and use the various types of survival equipment typically found on a vessel in suitably simulated situations a.3. Participate in abandon vessel musters and drills a.4. Communicate effectively with others as required when operating survival craft and ancillary survival equipment
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel).
3. Required knowledge and skills	a. Knowledge of relevant maritime regulations dealing with survival at sea following abandonment of vessel b. Relevant OH&S legislation and policies c. SOLAS regulations d. Incidents that may result in an emergency on board vessel and the appropriate response in each case e. Emergency muster and abandon vessel signals f. Importance of being ready for any shipboard emergency g. Procedures for emergency response on board vessels including abandoning vessel h. Initial actions for survival on abandonment of vessel as summarised in maritime survival publications such as the AMSA publication 'Survival at Sea – a Training and Instruction Manual' i. Value of training and emergency drills for enhancing chances of survival at sea j. Location of personal lifesaving appliances on a vessel k. Construction, outfit and particular characteristics of various types of life boats, life rafts and rescue boats l. Equipment found in survival craft, the function and the procedures for their use m. Procedures for correctly operating and using lifesaving appliances and personal safety equipment on board vessels and survival craft and specifically m.1. donning a life jacket and using a life jacket light and whistle m.2. donning an immersion suit m.3. deployment of a mob combination light and smoke float m.4. use of hand-held pyrotechnics n. Threats to survival on abandonment of a vessel and appropriate strategies for countering these threats o. Ways of maximising detectability and location of survival craft using pyrotechnic distress signals, portable VHF radios, satellite EPIRBs and SARTs p. IMO safety symbols q. Procedures for the rationing of food and water in survival craft r. Personal protective clothing and equipment -- their purpose and use s. Symptoms of hypothermia, its prevention and treatment and the related use of protective covers and garments such as immersion suits and thermal protective aids t. Maritime communication techniques

Evidence Guide (continued)

SURVIVE AT SEA IN THE EVENT OF VESSEL ABANDONMENT

<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to abandon vessel and survive at sea, and/or b. participate in vessel musters and drills in appropriately simulations of maritime conditions c. participate in abandon vessel simulations and drills on board an operational commercial or training vessel <p><i>Note:</i> Simulated abandon vessel and survival situations and assessments may require access to open and enclosed life boat fittings and equipment, on-load release gear training aid, open life boat and davit, life boat and rescue boat equipment, life jackets and hard hats, davit launched life raft and davit, inflatable throw over life raft, cradle and hydrostatic release, life boat/life raft boarding ladders, foul weather gear, training pool with jumping platform or equivalent, immersion suits, a selection of shipboard life saving, alerting and detection equipment typically found on vessels</p> <p>Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian standards. At least one assessor must hold a current life saving qualification appropriate for in-water training and assessment exercises</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 participating in simulated emergency response musters and drills a.2 operating survival equipment a.3 applying safety precautions relevant to survival operations a.4 assessing operational capability of survival craft and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 accepted survival procedures and maritime survival practice b.4 relevant manufacturer's guidelines relating to the operation and use of survival equipment, including instructions on equipment capability and limitations c. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDM MF12 01A MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire.

The unit is consistent with the related functional standard in Section A VI/1-2 of the STCW95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 4, and relevant sections of the Australian USL Code. It forms part of mandatory minimum requirements for familiarisation and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Carry out fire minimisation procedures</p>	<ul style="list-style-type: none"> a. Fire hazards on board vessel are identified and action is taken to eliminate or minimise them b. Responsibilities for checking fire prevention equipment and systems are fulfilled and appropriate action is taken to ensure that they are operational c. An awareness and understanding of the causes of fire and its minimisation is maintained through participation in fire drills and related instructional programs d. A state of readiness to respond to fire emergencies is maintained at all times
<p>2. Respond to emergency situations involving fire</p>	<ul style="list-style-type: none"> a. Emergency situations involving fire are correctly identified in accordance with established nautical practice b. Type of fire is identified in accordance with the established classification system for fires c. Initial action on becoming aware of fire emergency is in conformity with established practices and procedures d. Action taken is timely and appropriate for seriousness of the fire emergency e. Action taken on identifying muster signals for a fire emergency is appropriate and complies with established procedures f. Appropriate precautions and procedures are implemented when responding to electrical fires g. Appropriate precautions and procedures are implemented when responding to uptake and hydrogen fires h. Communications are clear and concise at all times and orders are acknowledged in a timely and seamanlike manner

Range Of Variables

MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work involves the application of prescribed principles and practice to the minimisation of the risk of fire onboard vessel. Maintenance of a state of readiness to respond to fire emergencies is involved. It requires some judgement and teamwork in the execution of prescribed procedures for the minimisation of the risk of fire and responding to fire emergencies onboard a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Fire emergencies on board vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of fires which may occur on board vessel include Classes A, B, C and F in the standard classification of fires d. Fire hazard minimisation procedures may include: <ul style="list-style-type: none"> d.1. housekeeping in work areas d.2. following of fire safety procedures d.3. checking and maintaining shipboard fire prevention systems d.4. identification and elimination or minimisation of fire hazards d.5. precautions when using and storing flammable materials d.6. precautions that need to be taken when responding to an electrical fire d.7. precautions that need to be taken when responding to uptake and hydrogen fires d.8. precautions when using naked flames or welding equipment
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant regulations concerning minimisation of the risk of fire on board vessel a.2. vessel's instructions and procedures concerning minimisation of the risk of fire a.3. publications on marine fire prevention and minimisation and emergency response a.4. fire-detection, fire-fighting and safety equipment operational and maintenance instructions and recommended procedures a.5. instructions of relevant Maritime Authorities related to the maintenance and serviceability of ship-board fire-detection, fire-fighting and safety equipment and systems a.6. relevant Australian and international standards
4. Workplace context	<p>Workplace organisation may be defined by:</p> <ul style="list-style-type: none"> a. Company work organisation procedures and practices b. Conditions of service, industrial legislation and agreements including: <ul style="list-style-type: none"> b.1. workplace agreements and awards b.2. Australian and State/Territory industrial legislation
5. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the IMO STCW Convention and Code, Australian USL Code and AMSA Marine Orders concerning minimisation of the risk of fire on board vessel a.2. regulations for the maintenance of fire-detection, fire-fighting and safety equipment and systems a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement fire prevention and minimisation measures and procedures on board vessel a.2. Recognise fire hazards onboard vessel and take appropriate action to eliminate or minimise them a.3. Assess the operational capability of fire-detection and fire- fighting equipment and systems and initiate any required maintenance or replenishment action a.4. Respond to emergency situations involving fire a.5. Implement OHS principles and policies when carrying out fire prevention and fire-fighting duties a.6. Communicate effectively with others as required during fire prevention activities and fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations concerning minimisation of the risk of fire on board vessel b. The chemistry of fire and its relationship to materials typically carried on vessels c. Principles underlying the spread of fire and its extinguishment, including <ul style="list-style-type: none"> c.1. the elements of fire and explosion (the fire triangle) c.2. types and sources of ignition c.3. flammable materials and fire hazards c.4. factors that influence the spread of fire d. The importance of constant vigilance in fire prevention and minimisation e. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment f. A basic understanding of the types of fire-detection, fire- fighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance g. Relevant regulations and policies related to the to the maintenance of fire equipment and systems h. Precautions and procedures that must be followed when responding to electrical fires i. Precautions and procedures that must be followed when responding to uptake and hydrogen fires j. Maritime communication techniques applicable to fire prevention and fire-minimisation activities on board vessel k. Problems that can occur with shipboard fire-detection and fire hazards on board a vessel and appropriate action that should be taken l. Sources of information on shipboard fire prevention and minimisation
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire prevention and minimisation strategies on board vessels, and/or b. assist in fire prevention and minimisation procedures and fire drills on board an operational trading or training vessel <p><i>Note:</i> Simulated fire prevention assessment exercises may require access to a fire training and assessment facility capable of simulating fire and fire-prevention activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards.</p>

Evidence Guide (continued)

MINIMISE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 implementing of fire prevention and minimisation measures and procedures a.2 identifying and evaluating fire hazards and taking appropriate courses of action a.3 responding to simulated and real emergency situations involving fire a.4 assessing the operational capability of fire-detection equipment and systems and taking any required maintenance or replenishment action <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations concerning minimisation of the risk of fire on board vessel b.2 OHS regulations and hazard prevention policies and procedures b.3 relevant manufacturer's guidelines relating to the use of fire-detection equipment and systems, including instructions on equipment capability and limitations b.4 on-board housekeeping processes and implementing fire-hazard prevention measures b.5 fire minimisation procedures and policies <p>c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection equipment and systems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2

TDM MF13 01A MANAGE MARINE FIRE-FIGHTING AND PREVENTION ACTIVITIES

Field MF Operational quality and safety

DESCRIPTION:

This unit involves the skills and knowledge required to carry out advanced fire fighting and to manage fire fighting and fire prevention activities on board a commercial vessel, including managing shipboard fire fighting teams, developing and implementing on-board fire fighting training exercises, coordinating shipboard tactical fire fighting activities, managing the evacuation of personnel from fire and smoke affected compartments, managing fire prevention and suppression activities involving hazardous goods, managing the maintenance of fire fighting equipment, supervising the operation of fixed fire suppression systems, liaising with shore-based agencies, and managing fire investigation and reporting activities.

The unit is consistent with the related functional standard in Section A VII/3 of the STCW 95 Code, AMSA Marine Orders – Part 3, Issue 5, Appendix 5 and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Manage shipboard fire fighting teams	<ul style="list-style-type: none"> a. The roles/functions of the command and other teams in a shipboard fire situation is established in accordance with regulatory requirements, established marine fire fighting practice and company requirements b. A check list for use in fire fighting management is developed and implemented in accordance with regulatory requirements and established marine fire fighting practice. c. Information on a shipboard fire situation is obtained and analysed by the command team in accordance with regulatory requirements and established marine fire fighting practice. d. Problems in shipboard fire are identified and appropriate strategies for dealing with tactical fire fighting problems are developed in accordance with regulatory requirements and established marine fire fighting practice. e. A check list for use in fire fighting management is developed and implemented in accordance with regulatory requirements and established marine fire fighting practice.
2. Coordinate shipboard tactical fire fighting activities	<ul style="list-style-type: none"> a. Hazards associated with a shipboard fire are identified and appropriate hazard control strategies developed and implemented in accordance with the vessel's safety management system, regulatory requirements and established marine fire fighting practice b. Controlled ventilation techniques are correctly applied in fire suppression and rescue applications in accordance with established marine fire fighting practice c. Tactical plan of action in a shipboard fire situation is determined in accordance with the fire control plan and established marine fire fighting practice d. Free surface effects that may occur during fire fighting operations are identified and appropriate solutions developed to maintain vessel stability in accordance with established marine fire fighting practice. e. Communications with fire teams and with outside stations are managed in accordance with vessel's procedures, regulatory requirements and established fire fighting practice.

<p>3. Liaise with shore-based agencies</p>	<p>a. Strategies for shipboard fire fighting management in port are developed with the regard to the Navigation Act, local fire regulations and regulations of the relevant port authority</p> <p>b. Appropriate liaison is maintained with relevant shore-based fire-fighting, emergency and port authorities in accordance with regulatory requirements and established fire fighting and emergency practices and procedures</p> <p>c. Appropriate strategies are developed and implemented for rapid briefing of shore based fire-fighters and other shore-based emergency organisations in accordance with regulatory requirements and established marine fire-fighting practice</p> <p>d. Appropriate strategies are developed and used for overcoming language barriers when communicating with shore based fire fighters</p>
<p>4. Supervise the operation of fixed fire suppression systems</p>	<p>a. The serviceability of fixed fire suppression systems is periodically checked in accordance with vessel's procedures, manufacturer's instructions and regulatory requirements</p> <p>b. Fixed fire fighting systems are correctly activated when required in accordance with vessel's procedures, manufacturer's instructions and regulatory requirements</p>
<p>5. Develop and implement on-board fire fighting training exercises</p>	<p>a. On board fire fighting training exercises are developed that are appropriate for the vessel type and are in accordance with established training practice, regulatory requirements and company procedures.</p> <p>b. On board fire fighting training arrangements comply with the requirements of maritime regulations</p> <p>c. Strategies for effective debriefing of fire fighting training exercises are developed and implemented in accordance with established training practice</p> <p>d. Fire fighting training exercises are evaluated in accordance with established training practice and company procedures</p> <p>e. Appropriate improvements are made to fire fighting exercises based on feedback provided through debriefings and evaluation findings</p>
<p>6. Manage the evacuation of personnel from fire and smoke affected compartments</p>	<p>a. Evacuation plans are prepared in accordance with the vessel's safety management system, regulatory requirements and established marine fire fighting practice</p> <p>b. Controlled ventilation is correctly used to keep occupied compartments smoke free</p> <p>c. The likely actions of passengers are anticipated and appropriate action is taken to ensure they comply with planned evacuation procedures</p> <p>d. Search and rescue operations for missing personnel are planned and implemented in accordance with the vessel's safety management system, regulatory requirements and established marine fire fighting practice</p> <p>e. The handling and treatment of injured personnel is coordinated in accordance with the vessel's safety management system, first aid and regulatory requirements and established marine fire fighting practice</p>
<p>7. Manage fire prevention and suppression activities involving hazardous goods</p>	<p>a. The vessel's hazardous goods stowage plan is located and correctly used in fire fighting and fire prevention activities.</p> <p>b. Appropriate material safety data sheets are obtained and interpreted in the event of a fire involving hazardous materials</p> <p>c. Fire prevention precautions in situations involving hazardous materials are correctly applied in accordance with the IMW Code and the vessel's safety management system</p> <p>d. Contingency plans for fires involving hazardous materials are prepared in accordance with the IMW Code and the vessel's safety management system</p> <p>e. Tactical methods for fighting fires involving hazardous materials are correctly applied in accordance with the IMW Code and the vessel's safety management system</p> <p>f. The BC Code is correctly applied in fire fighting and fire prevention situations and activities involving hazardous bulk cargoes</p>
<p>8. Manage the maintenance of fire fighting equipment</p>	<p>a. The routine maintenance of fire fighting and suppression equipment is coordinated in accordance with vessel's procedures, manufacturer's instructions, regulatory requirements and established fire fighting practice</p> <p>b. Arrangements are made for the replenishment, repair or replacement of faulty or depleted fire fighting and suppression equipment in accordance with vessel's procedures, manufacturer's instructions, regulatory requirements and established fire fighting practice</p> <p>c. Reports on routine maintenance and repair of fire fighting equipment are made in accordance with vessel's procedures and regulatory requirements</p>

9. **Manage fire investigation and reporting activities**

- a. An area affected by fire is correctly secured prior to investigation in accordance with the vessel's safety management system, regulatory requirements and established marine fire-fighting practice
- b. The cause of a fire is determined using appropriate methods in accordance with established fire investigation practice
- c. A fire investigation report is completed in accordance with regulatory requirements and established marine fire-fighting practice
- d. Relevant agencies are notified in the event of a shipboard fire in accordance with company procedures, regulatory requirements and established marine fire-fighting practice

Range Of Variables

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the maritime regulations, tanker safety guides and port regulations related to prevention and fighting of fires on vessels. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of advanced fire-fighting principles, techniques and tactics and procedures to the management of fire fighting and prevention activities on-board vessel. Contribution to the development of a broad plan for fire-fighting and prevention operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the fighting and prevention fire on a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel. b. Fire-fighting may need be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Fire fighting equipment may include: <ul style="list-style-type: none"> c.1. portable fire extinguishers, including foam, water, CO₂, dry chemical, and wet foam c.2. CO₂ fixed systems c.3. foam installations, including semi-portable and fixed installations c.4. sprinkler systems c.5. fire pumps, including main and emergency fire pump c.6. fire hoses, hydrants, branches and international shore connection d. Fixed fire suppression systems may include: <ul style="list-style-type: none"> d.1. Carbon dioxide d.2. water spray d.3. Halon alternatives e. Fixed fire suppression systems may be installed in: <ul style="list-style-type: none"> e.1. cargo holds e.2. machinery spaces f. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> f.1. masks and goggles f.2. breathing apparatus f.3. resuscitation equipment f.4. protective clothing, including headgear, gloves and footwear f.5. escape and rescue equipment g. Hazards when fighting fires may include: <ul style="list-style-type: none"> g.1. burns g.2. smoke g.3. explosion g.4. poisonous fumes and gas g.5. instability caused by the free surface effect g.6. environmental hazards to air and water g.7. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents g.8. release of toxic fluids, vapours and gases, involving skin contact, ingestion and inhalation g.9. corrosion hazards to personnel, vessel structures and equipment g.10. working in confined spaces

Range Of Variables (continued)

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. safety management system documentation (including ISM Code where applicable) a.3. vessel's log a.4. fire-detection, fire- fighting and safety equipment operational and maintenance instructions and recommended procedures a.5. instructions of relevant Maritime Authorities related to the maintenance and serviceability of vessel-board fire-detection, fire- fighting and safety equipment and systems a.6. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of USL Code and AMSA Marine Orders a.3. national an international regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.4. ISM Code (where applicable) a.5. Navigation Act as it relates to fire emergencies a.6. State / Territory Fire Acts a.7. relevant international, Australian and State/Territory OH&S and pollution control legislation a.8. relevant regulations and legislation of port authorities and related shore-based emergency authorities

Evidence Guide

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none">a.1. Manage and implement fire fighting and fire prevention measures and procedures on-board a vessela.2. Coordinate activities to ensure the operational capability of fire-detection and fire- fighting equipment and systems and any required maintenance or replenishment actiona.3. Manage interior search and rescue and fire-fighting teams on-board a vessela.4. Manage the evacuation of personnel from fire and smoke affected compartmentsa.5. Manage fire prevention and suppression activities involving hazardous goodsa.6. Manage the maintenance of fire fighting and suppression equipmenta.7. Liaise with shore-based agencies during a fire emergencya.8. Manage fire investigation and reporting activitiesa.9. Coordinate on-board fire fighting traininga.10. Implement OHS and pollution control principles and regulations when managing fire prevention and fire-fighting activitiesa.11. Communicate effectively with others as required during fire prevention activities and fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of marine officers with a responsibility to manage the prevention, control and fighting of fires on-board a vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none">a. Knowledge of sections of the relevant maritime regulationsb. Role and function of standard fire-fighting organisation models used on board vessels, including:<ul style="list-style-type: none">b.1. the role/function of the command team in a shipboard fire situationb.2. the roles of other fire fighting teams in a shipboard fireb.3. the role and duties of the scene leader in a shipboard fire scenarioc. The chemistry of fire and its relationship to materials typically carried on vesselsd. Principles underlying the spread of fire and its extinguishmente. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishmentf. The characteristics and hazards associated with fires on various vessel types and spacesg. Materials safety data sheets relevant to the various types of cargo carried on vesselsh. The importance of maintenance of fire detection and fire fighting equipment on board vesselsi. Types of fire-detection, fire- fighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenancej. Fire-fighting techniques applicable to different classes of fire on board a vesselk. Sources for information that available to the command team in a shipboard fire situationl. The implications of shipboard fire fighting management in port and procedures that must be followed to comply with port and state regulationsm. Problems that are likely to be encountered during the management of a shipboard fire and related tactics and solutions that can be appliedn. Relevant regulations, codes of practice, policies and procedures related to the to the maintenance of fire-detection, fire- fighting equipment and systemso. Methods for checking and replacing consumable materials in typical fire-detection and fire- fighting equipment and systems on board various types and sizes of vesselsp. The requirements for on-board fire fighting training, including:<ul style="list-style-type: none">p.1. basic training principles and practicep.2. on board firefighting training requirements as detailed in the AMSA Marine Ordersp.3. the importance of having aims and objectives for a training exercisep.4. procedures for evaluating and improving training activitiesq. Problems that can occur with fire-detection and fire- fighting equipment and operations on board a vessel and appropriate remedial action and solutions

Evidence Guide (continued)

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

<p>3. Required knowledge and skills (continued)</p>	<ul style="list-style-type: none"> r. The principle of operation of fixed fire suppression systems s. The procedure for the safe activation of fixed fire fighting systems t. The typical actions of passengers in a shipboard fire u. Maritime communication techniques applicable to the management of fire prevention and fire-fighting activities on board a vessel v. Strategies for rapid briefing of shore based fire fighters and other shore based emergency organisations w. Strategies for overcoming language barriers when communicating with shore based fire fighters x. Sources of information on fire prevention and extinguishment on board vessels
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to coordinate fire fighting and prevention strategies and manage interior search and rescue and fire-fighting teams on board vessels, and/or b. manage fire fighting and prevention strategies and interior search and rescue and fire-fighting teams in real and simulated fire emergency situations on board an operational vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards.</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. managing and implementing fire fighting and prevention measures and procedures on-board a commercial vessel a.2. coordinating activities to ensure the operational capability of fire-detection and fire-fighting equipment and systems and any required maintenance or replenishment action a.3. managing interior search and rescue and fire-fighting teams on-board a vessel a.4. managing the evacuation of personnel from fire and smoke affected compartments a.5. managing fire prevention and suppression activities involving hazardous goods a.6. managing the maintenance of fire fighting and suppression equipment a.7. liaising with shore-based agencies during a fire emergency a.8. managing fire investigation and reporting activities a.9. coordinating on-board fire fighting training b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. Relevant sections of IMO STCW Convention and Code, Australian USL Code and AMSA Marine Orders b.2. State/Territory fire regulations and legislation b.3. OHS regulations and hazard prevention policies and procedures b.4. pollution control regulations and legislation b.5. fire fighting and prevention procedures and policies b.6. job procedures and work instructions b.7. vessel's ISM Code safety management system (where applicable) b.8. relevant manufacturer's guidelines relating to the use of fire-detection and fire-fighting equipment and systems, including instructions on equipment capability and limitations b.9. following on-board housekeeping processes and fire-hazard prevention measures c. Action is taken promptly to report and/or rectify fire-related incidents in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MANAGE FIRE-FIGHTING AND PREVENTION ACTIVITIES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	1	3	2

TDM MF14 01A PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers, including developing vessel emergency plans, carrying out emergency shutdown of gas cargo operations, operating cargo valve closing systems, taking special precautions when carrying out onboard maintenance operations, taking appropriate action in the event of failure of systems or services essential to gas cargo, and taking appropriate action following collision, stranding or envelopment of the vessel in toxic or flammable vapour.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and the AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
1. Develop and implement operational and emergency plans relevant to liquefied gas tankers	<ul style="list-style-type: none"> a. Plans for tanker operations are prepared in accordance with operational orders, company procedures, the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures b. Correct procedures are followed when operating cargo valve closing systems c. Safety and emergency procedures are planned and implemented in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures d. Tests, inspections and repairs of tanker machinery and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures e. Action is taken in the event of machinery or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved and shipboard emergency and contingency plans followed f. Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of liquefied gas cargo g. Emergency shutdown of liquefied gas cargo operations is initiated upon identification of a defined emergency situation in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures h. Escape equipment, breathing apparatus, personal protective clothing and equipment, resuscitation equipment, and decontamination equipment are correctly used in emergency situations in accordance with manufacturer's instructions, regulatory requirements and company procedures i. Appropriate action is taken following collision, stranding or envelopment of the vessel in toxic or flammable vapour in accordance with the vessel's emergency plans and procedures and relevant international and national codes, conventions and regulatory requirements j. All emergency and safety incidents are reported and recorded in accordance with the tanker's ISM Code Safety Management System, regulatory requirements and company procedures

2. **Take special precautions when carrying out maintenance operations on liquefied gas tankers**
 - a. Special maintenance procedures are developed and implemented that take due account of the potential hazards that may occur during maintenance on a liquefied gas tanker
 - b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, tanker and the environment
 - c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations
 - d. Personal protective clothing and equipment are correctly used when carrying out maintenance work on a liquefied gas tanker
 - e. When required during maintenance operations, breathing apparatus is correctly used in accordance with manufacturer's instructions, regulatory requirements and company procedures
 - f. Where relevant, procedures and precautions necessary for entry into a pump room, tanks or other confined spaces when carrying out maintenance operations on a liquefied gas tanker are correctly followed

Range Of Variables

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations, tanker safety guides and port regulations related to liquefied gas tanker safety and operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of special safety precautions, operational procedures and hazard minimisation strategies to the management of the operations, maintenance and emergency situations on a liquefied gas tanker. Contribution to the development of integrated safety management plan for a liquefied gas tanker is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the development and implementation of an ISM management plan for operations, maintenance activities and emergencies on a liquefied gas tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial liquefied gas tanker b. Operational, maintenance and emergency procedures may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during warm-up and cool-down procedures b.6. during tank cleaning b.7. during liquefied gas cargo condition maintenance b.8. during liquefied gas cargo sampling c. Operations on a liquefied gas tanker may include: <ul style="list-style-type: none"> c.1. cool-down of a gas free system from ambient temperature c.2. liquefied gas loading preparation and operations c.3. maintenance operations during a loaded voyage c.4. liquefied gas discharging preparation and operations c.5. warm-up and gas-freeing operations c.6. tank-stripping and cleaning operations c.7. ballasting operations and de-ballasting operations c.8. maintenance operations during a ballast voyage d. Liquefied gas cargo handling systems and equipment may include: <ul style="list-style-type: none"> d.1. pumps and pumping arrangements and vapour-return systems, piping systems and valves d.2. filters and strainers d.3. expansion devices d.4. flame screens d.5. commonly used inert gases d.6. storage, generation and distribution systems d.7. temperature and pressure monitoring systems d.8. cargo vent systems d.9. liquid re-circulation and re-liquefaction systems d.10. cargo gauging, instrumentation systems and alarms d.11. CO₂ and gas detection and monitoring systems d.12. cargo boil-off systems and auxiliary systems. e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks, goggles and breathing apparatus e.2. resuscitation equipment e.3. protective clothing, including headgear, gloves and footwear e.4. escape and rescue equipment f. Hazards associated with liquefied gas cargoes may include: <ul style="list-style-type: none"> f.1. sources of ignition leading to explosion and fire f.2. electrostatic generation leading to discharge f.3. environmental hazards to air and water f.4. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.5. release of toxic fluids, vapours and gases, involving skin contact, ingestion and inhalation f.6. corrosion hazards to personnel, vessel structures and equipment f.7. working in confined spaces

Range Of Variables (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel's safety, maintenance and emergency procedures a.1. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to liquefied gas tankers a.3. 'Liquefied Gas Handling Principles on Ships and in Terminals' SIGTTO a.4. 'Tanker Safety Guide (Liquefied Gas)' ICS a.5. 'Ship to Ship Transfer Guide (Liquefied Gases)' ICS/OCIMF a.6. material safety data sheets a.7. tanker manufacturer's instructions and recommended procedures a.8. OHS and pollution prevention procedures relevant to the carriage of liquefied gas cargoes a.9. instructions of relevant Maritime Authorities concerning liquefied gas cargo operations and emergencies a.10. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to liquefied gas tankers a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and implement special safety, maintenance and emergency procedures on a liquefied gas tanker a.2. Identify typical safety, maintenance and emergency problems and hazards on a liquefied gas tanker and take appropriate action a.3. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to liquefied gas tanker operations a.4. Communicate effectively with others when carrying out special safety, maintenance and emergency procedures on a liquefied gas tanker
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a deck or engineering officer on a liquefied gas tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for liquefied gas tankers, including the IGC b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. The basic principles and trends in liquefied gas tanker design and the cargo containment and handling systems, including: <ul style="list-style-type: none"> c.1. types and design of liquefied gas tankers and their equipment c.2. cargo containment systems with special reference to rules, surveys, tank construction, materials, coatings, insulation and compatibility. c.3. cargo handling equipment including pumps and pumping arrangements and vapour return systems, and piping systems and valves c.4. cargo conditioning systems including warm-up and cool-down procedures c.5. tank atmosphere control systems including the use of inert gas and nitrogen c.6. instrumentation of cargo containment and handling systems including that of gauging, sampling and temperature control and pressure monitoring systems d. Safety procedures and regulatory requirements for loading, discharge, handling and condition monitoring of liquefied gas cargo including: <ul style="list-style-type: none"> d.1. cargo loading and discharging preparations and procedures d.2. the purpose and use of check lists, including the Ship/Shore checklist d.3. the importance of correct supervision and the use of monitoring equipment when handling liquefied gas cargoes d.4. cargo condition monitoring and maintenance on passage and in harbour d.5. liquefied gas cargo sampling procedures d.6. ballasting and de-ballasting procedures d.7. the warm up and gas freeing procedures d.8. the procedures for cool-down of a gas-free system from ambient temperature and the safety precautions involved e. Special safety precautions with respect to repair and maintenance work on a liquefied gas tanker, including: <ul style="list-style-type: none"> e.1. an understanding of the types of hazards and their causes e.2. safety and hazard minimisation procedures used on liquefied gas tankers e.3. the design features of the vessels which control the major hazards on a liquefied gas tanker e.4. health hazards of liquefied gas cargoes and the means to prevent related safety incidents e.5. basic toxicological terminology e.6. routes of entry of toxins to the human body e.7. special first aid measures which may be required on a liquefied gas tanker, including administering antidotes when dealing with a safety incident involving liquefied gases f. Principles and procedures for emergency operations on a liquefied gas tanker, including: <ul style="list-style-type: none"> f.1. the importance of developing vessel emergency plans f.2. techniques for emergency shutdown of cargo operations on a liquefied gas tanker f.3. actions to be taken in the event of failure of services essential to liquefied gas cargo f.4. actions to be taken on a liquefied gas tanker following a collision, stranding, spillage or envelopment of the vessel in toxic or flammable vapour f.5. the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, rescue equipment and protective clothing and equipment f.6. procedures for entry into and effecting a rescue from enclosed spaces on a tanker f.7. importance of supervising personnel during potentially hazardous operations f.8. types and principles of certified safe electrical equipment and sources of ignition

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR LIQUEFIED GAS TANKERS

3. Required knowledge and skills (continued)	g. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of oil cargo
4. Resource implications	Access is required to opportunities to either: a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers, and/or b. plan and implement special safety, maintenance and emergency procedures on board an operational liquefied gas tanker
5. Consistency in performance	a. Applies underpinning knowledge and skills when: a.1 planning and implementing special safety, maintenance and emergency procedures for liquefied gas tankers a.2 identifying and evaluating liquefied gas cargo safety, maintenance and emergency problems and hazards and determining appropriate courses of action a.3 identifying and implementing improvements to liquefied gas cargo safety, maintenance and emergency procedures b. Shows evidence of application of relevant workplace procedures including: b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS and pollution control regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the conduct of maintenance on liquefied gas tankers b.4 pollution management processes c. Action is taken promptly to report and/or rectify operational accidents and incidents in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF15 01A PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to plan and implement special safety, maintenance and emergency procedures for chemical tankers, including developing vessel emergency plans, carrying out emergency shutdown of chemical cargo operations, , taking special precautions when carrying out onboard maintenance operations, applying medical first aid in relation to chemical cargo accidents, using resuscitation and decontamination equipment and breathing apparatus and escape equipment, carrying out safe entry into and rescue from enclosed spaces, and taking appropriate action following collision, stranding or chemical spillage.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Develop and implement operational and emergency plans relevant to chemical tankers</p>	<ul style="list-style-type: none"> a. Plans for tanker operations are prepared in accordance with operational orders, company procedures, the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures b. Safety and emergency procedures are planned and implemented in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures c. Tests, inspections and repairs of tanker machinery and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures d. Action is taken in the event of machinery or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved and shipboard emergency and contingency plans followed e. Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of chemical cargo f. Emergency shutdown of chemical cargo operations is initiated upon identification of a defined emergency situation in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures g. Escape equipment, breathing apparatus, personal protective clothing and equipment, resuscitation equipment, and decontamination equipment are correctly used in emergency situations in accordance with manufacturer's instructions, regulatory requirements and company procedures h. Appropriate action is taken following collision, stranding, or chemical spillage in accordance with the vessel's emergency plans and procedures and relevant international and national codes, conventions and regulatory requirements i. Appropriate medical first aid is applied in relation to chemical cargo accidents in accordance with established first aid practice and company procedures j. All emergency and safety incidents are reported and recorded in accordance with the tanker's ISM Code Safety Management System, regulatory requirements and company procedures

2. Take special precautions when carrying out maintenance operations on chemical tankers
 - a. Special maintenance procedures are developed and implemented that take due account of the potential hazards that may occur during maintenance on a chemical tanker
 - b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, tanker and the environment
 - c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations
 - d. Personal protective clothing and equipment are correctly used when carrying out maintenance work on a chemical tanker
 - e. When required during maintenance operations, breathing apparatus is correctly used in accordance with manufacturer's instructions, regulatory requirements and company procedures
 - f. Where relevant, procedures and precautions necessary for entry into a pump room, tanks or other confined spaces when carrying out maintenance operations on a chemical tanker are correctly followed

Range Of Variables

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations, tanker safety guides and port regulations related to chemical tanker safety and operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of special safety precautions, operational procedures and hazard minimisation strategies to the management of the operations, maintenance and emergency situations on a chemical tanker. Contribution to the development of integrated safety management plan for a chemical tanker is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the development and implementation of an ISM management plan for operations, maintenance activities and emergencies on a chemical tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial chemical tanker b. Operational, maintenance and emergency procedures may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during chemical cargo condition monitoring and maintenance b.6. during chemical cargo sampling c. Operational cargo handling cycle of a chemical tanker may include: <ul style="list-style-type: none"> c.1. chemical cargo loading preparation and operations c.2. cargo monitoring and maintenance operations during a loaded voyage c.3. chemical cargo discharging preparation and operations c.4. tank-stripping and cleaning operations c.5. ballasting operations c.6. maintenance operations during a ballast voyage c.7. de-ballasting operations d. Chemical cargo handling systems and related equipment may include: <ul style="list-style-type: none"> d.1. chemical cargo pumps and pumping arrangements and venting and vapour return systems, piping systems and valves d.2. tank temperature control systems and alarms d.3. filters and strainers d.4. gas freeing systems d.5. storage, generation and distribution systems d.6. temperature and pressure monitoring systems d.7. cargo vent systems d.8. cargo vapour return systems d.9. tank cleaning systems d.10. liquid re-circulation and re-liquefaction systems d.11. cargo gauging, instrumentation systems and alarms e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks and goggles e.2. protective clothing, including headgear, gloves and footwear e.3. breathing apparatus e.4. resuscitation equipment e.5. escape and rescue equipment f. Hazards associated with chemical cargoes may include: <ul style="list-style-type: none"> f.1. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.2. environmental hazards to air and water f.3. spills or release of toxic fluids, vapours and gases, involving skin contact, inhalation and ingestion f.4. corrosion hazards to personnel, vessel structures and equipment f.5. working in confined spaces

Range Of Variables (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel's safety, maintenance and emergency procedures a.3. established tanker and company chemical cargo operations procedures a.4. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to chemical tankers a.5. 'Safety in Chemical Tankers' ICS a.6. 'Tanker Safety Guide (Chemical Tankers)' ICS a.7. 'International Safety Guide for Oil Tankers and Terminals' ICS/OCIMF a.8. 'Ship to Shore Safety Checklist' ICS/OCIMF a.9. 'Ship to Ship Transfer Guide (Petroleum)' ICS/OCIMF a.10. material safety data sheets a.11. tanker manufacturer's instructions and recommended procedures a.12. OHS and pollution prevention procedures relevant to the handling of chemical cargoes a.13. instructions of relevant Maritime Authorities concerning chemical cargo operations a.14. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include:</p> <ul style="list-style-type: none"> a.1. sections of the IMO STCW 95 Code and Convention related to chemical tankers a.2. relevant sections of AMSA Marine Orders a.3. instructions of relevant Maritime Authorities concerning chemical cargo operations a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and implement special safety, maintenance and emergency procedures on a chemical tanker a.2. Identify typical safety, maintenance and emergency problems and hazards on a chemical tanker and take appropriate action a.3. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to chemical tanker cargo operations a.4. Communicate effectively with others when carrying out special safety, maintenance and emergency procedures on a chemical tanker
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a deck or engineering officer on a chemical tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for chemical tankers b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. Safety procedures and regulatory requirements for loading, discharge, handling and condition monitoring of chemical cargo including: <ul style="list-style-type: none"> c.1. typical calculations required when coordinating the handling of chemical cargo c.2. procedures for the preparation of loading and discharge plans for multiple grade tanker cargoes with due regard to cargo segregation and cargo care on passage. c.3. cargo loading and discharging preparations and procedures c.4. the purpose and use of check lists, including the Vessel/Shore checklist c.5. the importance of correct supervision and the use of monitoring equipment when handling chemical cargoes c.6. cargo condition monitoring and maintenance on passage and in harbour c.7. principles and procedures for the segregation of cargoes c.8. procedures for cargo transfer and changing cargoes c.9. the use and maintenance of inert atmospheres during cargo operations c.10. procedures for controlling entry into pumprooms and confined spaces c.11. the principle of operation of gas detection and safety equipment c.12. gas detection and safety equipment requirements for various shipboard scenarios on a chemical tanker c.13. procedures to prevent air and water pollution including disposal of wastes and washings c.14. the procedure for tank cleaning and gas freeing operations, including the use of absorption, wetting agents and detergents c.15. cargo gauging, sampling and testing c.16. ballasting and de-ballasting c.17. emergency procedures, i.e. pre-planned action in the event of spillages, leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty d. Special safety precautions with respect to repair and maintenance work on a chemical tanker, particularly maintenance activities that affect pumping, piping, electrical and control system. which may be contaminated with toxic vapours or liquid e. The hazards associated with chemical cargoes, including: <ul style="list-style-type: none"> e.1. an understanding of the types of hazards and their causes e.2. safety and hazard minimisation procedures used on chemical tankers e.3. the design features of the vessels which minimise or eliminate the major hazards on a chemical tanker e.4. potential health hazards of various chemical cargoes and the means to prevent related safety incidents e.5. basic toxicological terminology e.6. routes of entry of toxins to the human body e.7. special first aid measures which may be required on a chemical tanker, including administering antidotes when dealing with a safety incident involving chemicals f. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of chemical cargo

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

<p>3. Required knowledge and skills (continued)</p>	<p>g. Principles and procedures for emergency operations on a chemical tanker, including:</p> <ul style="list-style-type: none"> g.1. the importance of developing vessel emergency plans g.2. techniques for emergency shutdown of cargo operations on a chemical tanker g.3. actions to be taken in the event of failure of services essential to chemical cargo g.4. actions to be taken on a chemical tanker following a collision, grounding or spillage g.5. the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, protective clothing and decontamination equipment g.6. procedures for entry into and effecting a rescue from enclosed spaces on a chemical tanker <p>h. Principles of chemical cargo containment, including:</p> <ul style="list-style-type: none"> h.1. containment systems h.2. rules h.3. surveys h.4. tank construction h.5. materials h.6. coatings h.7. temperature control h.8. insulation h.9. compatibility h.10. medical first aid and administering of antidotes. <p>i. The properties and characteristics of chemicals and their vapours, including:</p> <ul style="list-style-type: none"> i.1. the characteristics of chemicals typically carried i.2. toxicity of various chemical cargoes i.3. critical temperatures of typical chemical cargoes i.4. hazards of typical chemical cargoes and measures for hazard control i.5. safety guides applicable for typical chemical cargoes carried <p>j. Basic principles of toxicity of chemicals, including</p> <ul style="list-style-type: none"> j.1. the modes by which chemicals and their vapours may be toxic j.2. the toxic properties of inhibitors and of products of combustion of both materials of construction and of chemicals carried j.3. acute and chronic effects of toxicity, j.4. systemic poisons and irritants j.5. the Threshold Limit Value (TLV) j.6. hazards of skin contact, inhalation and ingestion
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to plan and implement special safety, maintenance and emergency procedures for chemical tankers, and/or b. plan and implement special safety, maintenance and emergency procedures on board an operational chemical tanker
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning and implementing special safety, maintenance and emergency procedures for chemical tankers a.2 identifying and evaluating chemical cargo safety, maintenance and emergency problems and determining appropriate courses of action a.3 identifying and implementing improvements to chemical cargo safety, maintenance and emergency procedures b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2 OHS and pollution control regulations and hazard prevention policies and procedures b.3 ISM Code safety management system procedures and work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations b.4 ISM Code safety management system and quality procedures (where existing) b.5 following on-board housekeeping processes b.6 pollution management processes c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF16 01A PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR OIL TANKERS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to plan and implement special safety, maintenance and emergency procedures for oil tankers, including developing vessel emergency plans, carrying out emergency shutdown of oil cargo operations, taking special precautions when carrying out onboard maintenance operations, taking appropriate action in the event of failure of systems or services essential to oil cargo, applying medical first aid in relation to oil cargo accidents, using resuscitation equipment and breathing apparatus for safe entry into and rescue from enclosed spaces, and taking appropriate action following collision, stranding or oil spillage.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
1. Develop and implement operational and emergency plans relevant to oil tankers	<ul style="list-style-type: none"> a. Plans for tanker operations are developed are prepared in accordance with operational orders, company procedures, the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures b. Safety and emergency procedures are planned and implemented in accordance with the tanker's ISM Code Safety Management System, international and national codes, conventions and regulatory requirements and company procedures c. Tests, inspections and repairs of tanker machinery and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures d. Action is taken in the event of machinery, pump, valve or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved in accordance with shipboard emergency and contingency plans followed e. Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of oil and petroleum cargo f. Emergency shutdown of oil cargo operations is initiated upon identification of a defined emergency situation in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements and company procedures g. Escape equipment, breathing apparatus, personal protective clothing and equipment, resuscitation equipment, and decontamination equipment are correctly used in emergency situations in accordance with manufacturer's instructions, regulatory requirements and company procedures h. Appropriate action is taken following collision, stranding or oil spillage in accordance with the vessel's emergency plans and procedures, the requirements of relevant port authorities, and relevant international and national codes, conventions and regulatory requirements i. Appropriate medical first aid is applied in relation to oil cargo accidents and emergencies in accordance with established first aid practice and company procedures j. All emergency and safety incidents are reported and recorded in accordance with the tanker's ISM Code Safety Management System, regulatory requirements and company procedures

2. Take special precautions when carrying out maintenance operations on oil tankers
 - a. Special maintenance procedures are developed and implemented that take due account of the potential hazards that may occur during maintenance on a oil tanker
 - b. Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, tanker and the environment
 - c. Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations
 - d. Personal protective clothing and equipment are correctly used when carrying out maintenance work on a oil tanker
 - e. When required during maintenance operations, breathing apparatus is correctly used in accordance with manufacturer's instructions, regulatory requirements and company procedures
 - f. Where relevant, procedures and precautions necessary for entry into a pump room, tanks or other confined spaces when carrying out maintenance operations on a oil tanker are correctly followed

Range Of Variables

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations, tanker safety guides and port regulations related to oil tanker safety, operations and pollution control. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of special safety precautions, operational procedures and hazard minimisation strategies to the management of the operations, maintenance and emergency situations on an oil tanker. Contribution to the development of integrated safety management plan for an oil tanker is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the development and implementation of an ISM management plan for operations, maintenance activities and emergencies on an oil tanker.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial oil tanker b. Operational, maintenance and emergency procedures may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible operational conditions b.3. during loading and discharging of cargo b.4. during ballasting and de-ballasting b.5. during tank cleaning b.6. during crude oil washing procedures b.7. during oil cargo monitoring and maintenance b.8. during oil cargo sampling c. Operational cargo handling cycle of a oil tanker may include: <ul style="list-style-type: none"> c.1. oil loading preparation and operations c.2. load-on-top operations c.3. monitoring and maintenance operations during a loaded voyage c.4. oil discharging preparation and operations c.5. tank-stripping and cleaning operations c.6. ballasting operations c.7. maintenance operations during a ballast voyage c.8. de-ballasting operations d. Oil cargo handling systems and equipment may include: <ul style="list-style-type: none"> d.1. pumps and pumping arrangements and venting and vapour-return systems, piping systems and valves d.2. filters and strainers d.3. expansion devices d.4. flame screens d.5. commonly used inert gases d.6. storage, generation and distribution systems d.7. temperature and pressure monitoring systems d.8. inert gas systems d.9. gas-freeing systems d.10. cargo gauging, instrumentation systems and alarms d.11. gas detection and monitoring systems e. Personal protective clothing and equipment may include: <ul style="list-style-type: none"> e.1. masks and goggles e.2. breathing apparatus e.3. resuscitation equipment e.4. protective clothing, including headgear, gloves and footwear e.5. escape and rescue equipment

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

<p>2. Worksite environment (continued)</p>	<p>f. Hazards associated with oil cargoes may include:</p> <ul style="list-style-type: none"> f.1. sources of ignition leading to explosion and fire f.2. electrostatic generation leading to discharge f.3. environmental hazards to air and water f.4. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.5. spills or release of toxic fluids, vapours and gases, involving skin contact and inhalation f.6. corrosion hazards to personnel, vessel structures and equipment f.7. working in confined spaces
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. vessel's safety, maintenance and emergency procedures a.3. established tanker and company oil cargo operations procedures a.4. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to oil tankers a.5. 'International Safety Guide for Oil Tankers and Terminals' ICS/OCIMF a.6. 'Ship to Ship Transfer Guide (Petroleum)' ICS/OCIMF a.7. 'Clean Seas Guide for Oil Tankers (Retention of Oil Residues on Board)' ICS/OCIMF a.8. material safety data sheets a.9. tanker manufacturer's instructions and recommended procedures a.10. OHS procedures relevant to the handling of oil cargoes a.11. instructions of relevant Maritime Authorities concerning oil cargo operations a.12. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to oil tankers a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan and implement special safety, maintenance and emergency procedures on an oil tanker a.2. Identify typical safety, maintenance and emergency problems and hazards on an oil tanker and take appropriate action a.3. Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to oil tanker operations a.4. Communicate effectively with others when carrying out special safety, maintenance and emergency procedures on an oil tanker
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a deck or engineering officer on an oil tanker.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and AMSA Marine Orders applicable for oil tankers b. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures c. The basic principles and trends in oil tanker design and the cargo containment and handling systems, including: <ul style="list-style-type: none"> c.1. typical piping and pumping arrangements c.2. typical deck arrangements c.3. cargo tank arrangements c.4. types of cargo pumps and their application to various types of oil and petroleum cargo c.5. tank cleaning, gas freeing and inerting systems c.6. the major components of an inert gas plant c.7. cargo tank venting and accommodation ventilation systems and procedures c.8. the requirements of shipboard gauging systems and their associated instrumentation and alarms c.9. the requirements for cargo heating systems on oil tankers c.10. the safety aspects of electrical systems on oil tankers d. Procedures and regulatory requirements for loading, discharge, handling and condition monitoring of oil cargo, including: <ul style="list-style-type: none"> d.1. cargo loading and discharging preparations and procedures d.2. loading and discharge plans for multiple grade tanker cargoes with due regard to cargo segregation and cargo care on passage. d.3. loading and discharging procedures including vessel-to-vessel transfers d.4. the use of check lists including the vessel/shore checklist. d.5. the importance of correct supervision and use of monitoring equipment d.6. the procedure for tank cleaning and gas freeing operations d.7. crude oil washing procedures d.8. the use and maintenance of inert gas atmospheres during cargo handling operations and its role in the gas freeing process d.9. regulations and procedures for the control of entry into pumprooms and confined spaces d.10. the principle of operation of gas detection equipment d.11. appropriate gas detection equipment for given shipboard scenarios d.12. the use of load-on-top techniques are explained. d.13. proper ballasting and de-ballasting procedures are described. d.14. procedures to prevent air and water pollution including disposals of wastes and washings d.15. emergency procedures, i.e. pre-planned action in the event of leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty e. Oil cargo handling systems and equipment and the procedures for their use f. The chemical and physical characteristics of oil cargoes, including: <ul style="list-style-type: none"> f.1. the basic chemistry of hydrocarbons and simple chemical reactions f.2. the physical characteristics of a variety of oil cargoes f.3. the practical significance of flashpoint, flammable range and auto-ignition temperature g. Special precautions and procedures when carrying out repairs and maintenance on oil tankers <ul style="list-style-type: none"> g.1. the special safety factors and precautions necessary in the performance of hot work on an oil tanker g.2. correct hot work procedures, including requirements for permits to carry out work g.3. safety precautions with respect to repair and maintenance work including that affecting pumping, piping, electrical and control systems which may be contaminated with toxic vapours or liquid

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

<p>3. Required knowledge and skills (continued)</p>	<p>a. The hazards associated with oil cargoes, including:</p> <ul style="list-style-type: none"> a.1. an understanding of the types of hazards and their causes a.2. safety and hazard minimisation procedures used on oil tankers a.3. the sources of ignition that may be present on tankers a.4. the principles of electrostatic generation are described, and the possible situations which might lead to a discharge aboard a tanker a.5. the design features of the vessels which minimise or eliminate the major hazards a.6. the health hazards of associated cargoes are detailed and the means to prevent incidents <p>b. Principles and procedures for emergency operations on an oil tanker, including:</p> <ul style="list-style-type: none"> b.1. the importance of developing tanker emergency plans b.2. techniques for emergency shutdown of cargo operations b.3. actions to be taken in the event of failure of services essential to oil cargo b.4. actions to be taken following a collision, grounding or spillage, including a vapour release from an oil tanker b.5. the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, rescue equipment, decontamination equipment and protective clothing and equipment b.6. the procedures for entry into and effecting a rescue from enclosed spaces <p>c. Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of oil cargo</p>
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to plan and implement special safety, maintenance and emergency procedures on a oil tanker, and/or b. plan and implement special safety, maintenance and emergency procedures on a on board an operational oil tanker
<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. planning and implementing special safety, maintenance and emergency procedures for oil tankers a.2. identifying and evaluating oil cargo safety, maintenance and emergency problems and hazards and determining appropriate courses of action a.3. identifying and implementing improvements to oil cargo safety, maintenance and emergency procedures <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2. OHS and pollution control regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions on the conduct of maintenance on oil tankers b.4. job procedures and work instructions b.5. following on-board housekeeping processes b.6. pollution management processes <p>c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>

Evidence Guide (continued)

PLAN AND IMPLEMENT SPECIAL SAFETY AND EMERGENCY PROCEDURES FOR OIL TANKERS

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF17 01A RESPOND TO DISTRESS SIGNAL AT SEA

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to respond to a distress signal at sea and participate in related search and rescue operations in accordance with the procedures contained in the IMO/ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR).

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2 and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Respond to a distress signal	<ul style="list-style-type: none"> a. Distress and emergency signals and communications are recognised and evaluated in accordance with company procedures and Australian and international regulations and conventions b. Emergency is assessed and level and nature of assistance required and its practicability is established c. Communications are established where possible with the parties in distress, other search vessels and/or aircraft and other organisations and persons who may be involved in the search and rescue operation d. Details of the emergency are communicated to senior officers on-board a vessel for appropriate action
2. Establish and maintain radio-communications	<ul style="list-style-type: none"> a. Radio communications are established and maintained with the parties in distress, other search vessels and/or aircraft, search and rescue coordination authorities and other organisations and persons who may be involved in the search and rescue operation b. Records are accurately kept of all communications made during the emergency including frequencies and content of messages
3. Assist in search and rescue operations	<ul style="list-style-type: none"> a. Information concerning the emergency is regularly collected from all vessels, aircraft and other parties involved in the search and rescue operation b. Directions of senior officer involved in the search and rescue operation are followed in accordance the established chain of command c. Manoeuvres of vessel as part of search and rescue operations are made in accordance with the agreed plan d. Manoeuvres of vessel are made safely with due regard to the limits of propulsion, steerage and vessel stability and the prevailing weather and sea conditions e. Records of the incident are made in the vessel's log and other documentation is completed as required by Australian and international regulations and conventions

Range Of Variables

RESPOND TO DISTRESS SIGNAL AT SEA

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of search and rescue principles and techniques across a wide and often unpredictable variety of maritime emergency contexts. Implementation of a broad plan or strategy for participation in marine search and rescue operations is required. Limited accountability and responsibility for self and others in achieving the rescue outcomes is involved. d. Work requires participation in the technical and operational functions involved in search and rescue operations and procedures.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Search and rescue operations may be carried out <ul style="list-style-type: none"> b.1. by day or night b.2. under any possible weather and sea conditions b.3. as sole vessel in the operation b.4. in conjunction with other vessels, aircraft and other parties c. Party in distress may include: <ul style="list-style-type: none"> c.1. vessel(s) in distress c.2. person(s) in distress in sea c.3. person(s) in distress in survival craft c.4. ditched aircraft d. Distress signal or request for assistance may originate from: <ul style="list-style-type: none"> d.1. vessel(s) in distress d.2. person(s) in distress in sea d.3. person(s) in distress in survival craft d.4. ditched aircraft in sea d.5. observer on a vessel at sea d.6. land-based source d.7. request from a search and rescue centre e. Participation in search and rescue operations may include: <ul style="list-style-type: none"> e.1. receiving and relaying instructions from search and rescue authorities e.2. establishing and maintaining a communications net e.3. communicating with others in the chain of command e.4. establishing position of distressed person(s), vessel or aircraft e.5. implementing search and rescue plans e.6. receiving and/or giving directions to others during the search and rescue operation e.7. maintaining accurate records of the operation and its outcomes f. Signals and communications may be by radio and/or visual methods and may be maintained with: <ul style="list-style-type: none"> f.1. party in distress f.2. search and rescue authorities f.3. other vessels f.4. aircraft f.5. other parties involved in the rescue g. Special handling techniques required during a rescue may include: <ul style="list-style-type: none"> g.1. assisting a vessel or aircraft in distress g.2. towing operations g.3. launching rescue boats and survival craft g.4. taking on board survivors from rescue boats and survival craft

Range Of Variables (continued)

RESPOND TO DISTRESS SIGNAL AT SEA

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. Relevant maritime regulations a.2. IMO/ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR). a.3. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) a.4. operational orders a.5. navigational charts a.6. vessel's log a.7. company procedures a.8. vessel manufacturer's instructions and recommended procedures a.9. instructions of international and national search and rescue authorities a.10. instructions of relevant Maritime Authorities
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. the Australian USL Code a.4. SOLAS Convention a.5. International Regulations for Preventing Collisions at Sea a.6. relevant international, Australian and State/Territory OH&S legislation a.7. relevant international, Australian and State/Territory search and rescue conventions and regulations

Evidence Guide

RESPOND TO DISTRESS SIGNAL AT SEA

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Recognise and respond to distress and emergency calls a.2. Interpret the requirements of the IMO/ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) when participating in a real or simulated search and rescue operation a.3. Assist in the implementation of real or simulated search and rescue operations in conjunction with search and rescue authorities and other relevant parties a.4. Manoeuvre vessel safely during a real or simulated search and rescue operation a.5. Identify typical search and rescue problems and take appropriate action a.6. Communicate effectively with search and rescue authorities and others during real or simulated search and rescue operations a.7. Record the search and rescue incident accurately in accordance with company and international and Australian regulatory requirements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Awareness and understanding of the role of an officer of the watch when involved in search and rescue operations as described in the IMO/ICAO International Aeronautical and Maritime Search and Rescue Manual (IAMSAR). c. Relevant OH&S legislation, codes of practice, policies and procedures d. SOLAS Convention e. ISM Code Safety Management System (where applicable) f. Search and rescue techniques and procedures g. Responsibilities when participating in search and rescue operations h. Chain of command and organisational requirements used in search and rescue operations i. Sequence of action to be taken upon sighting or receiving a distress signal or a call for assistance j. Procedures for fixing the position of a distress signal or call for assistance k. Drift patterns of disabled vessels and survival craft in relation to wind and current l. Types of distress and emergency signals and types of response required in each case m. Maritime communication techniques applicable to search and rescue operations n. Search and rescue problems and appropriate action and solutions o. Types of search patterns and their application p. Effects on vessel handling of wind, currents and bottom topography q. Typical manoeuvring and engine characteristics for vessels of 500 gross tonnage or more, including stopping distances and turning circles at various draughts, speeds and loading r. Constant rate of turn techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to assist in emergency and distress situations, and/or b. assist in the conduct of a suitably-simulated search and rescue operation, including possible operation of a suitable vessel simulator

Evidence Guide (continued)

RESPOND TO DISTRESS SIGNAL AT SEA

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 responding to a distress signal at sea a.2 assisting in real or simulated search and rescue operations a.3 identifying and evaluating search and rescue problems and determining appropriate courses of action a.4 identifying and implementing improvements to procedures when assisting in search and rescue processes a.5 applying safety precautions relevant to search and rescue operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures (where applicable) b.3 OHS regulations and hazard prevention policies and procedures b.4 search and rescue procedures b.5 environmental protection during search and rescue operations c. Action taken promptly to report and/or rectify accidents and incidents arising during search and rescue operations in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3

TDM MF18 01A APPLY MEDICAL FIRST AID ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to provide medical first aid on board a vessel in accordance with procedures as specified in the publications: (1) 'International Medical Guide for Ships', (2) Medical Section of the 'International Code of Signals' and (3) 'Medical First Aid Guide for Use in Accidents involving Dangerous Goods'. This includes providing first aid in a medical emergency on-board a vessel, seeking assistance from shore-based medical advisers where necessary and carrying out first aid as directed from shore-based medical advisers.

The unit is consistent with the related functional standard in Sections A II/2 and AIII/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2 and Appendix 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Provide medical first aid on board a vessel.</p>	<ul style="list-style-type: none"> a. A patient condition assessment is carried out in accordance with established first aid procedures and the nature of injury or illness is established b. Appropriate first aid procedures are used to manage the identified injury or illness in accordance with the officer's limits of responsibility c. Where there are doubts over the seriousness of the injury or illness and how to treat the patient, assistance is sought from senior officers or shore-based medical advisers d. Aseptic techniques are applied during any wound dressing e. The position of the patient is adjusted to optimise personal comfort for the medical condition or injury concerned f. Hygiene measures are used that are appropriate for the degree of illness or injury g. Cardio-pulmonary resuscitation techniques are correctly applied where required h. Oxi-viva equipment is used where required in accordance with safety procedures and instructions i. Condition of the patient is regularly monitored both visually and through appropriate measures of bodily signs j. Health precautions and disease prevention measures are implemented in accordance with regulatory requirements and company procedures k. Appropriate action is taken if there are signs of a deterioration in the condition of the patient
<p>2. Seek assistance from shore-based medical advisers</p>	<ul style="list-style-type: none"> a. Correct procedures are used to access radio medical advice when necessary to provide first aid in a medical emergency on board a vessel b. Protocols and procedures required when seeking radio medical advice for accident and injury are followed
<p>3. Carry out first aid procedures as directed from shore-based medical advisers</p>	<ul style="list-style-type: none"> a. Symptoms, signs and descriptions of assessments made of a patient's condition are relayed to the shore-based adviser b. First aid procedures are carried out as directed by the shore-based advisers c. Advice from shore-based advisers is complemented by reference to relevant marine publications on medical care on board a vessel

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| 4. Maintain vessel's medicine resources. | a. The vessel's medicine resources are maintained in accordance with company procedures and health regulations
b. Records are kept of the storage and use of medicine resources in accordance with regulatory requirements and company procedures |
| 5. Maintain medical records. | a. Records of medical first aid provided on-board a vessel are kept in accordance with regulatory requirements and company procedures |

Range Of Variables

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of a knowledge of the basic techniques required to provide first aid to crew and/or passengers during a medical emergency on board a vessel. Provision of first aid in accordance with company procedures and limits of officer's/rating's responsibility is required. c. Work requires appropriate skill in recognising and confirming the nature and extent of injury or illness and the provision of first aid within the limits of responsibility. First aid may be provided under remote direction and advice from shore-based medical advisers.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Medical first aid procedures may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway or at anchor b.4. during quarantine procedures when entering port c. Medical emergencies may include <ul style="list-style-type: none"> c.1. heart attack c.2. stroke c.3. asthma c.4. diabetes c.5. epilepsy d. Management of injuries on board a vessel may include: <ul style="list-style-type: none"> d.1. external bleeding d.2. an amputation d.3. a foreign body in the eye d.4. a penetrating chest wound d.5. a nose bleed d.6. internal bleeding d.7. fractures, sprains, strains and dislocations d.8. electric shock d.9. asphyxia e. Conditions requiring special first aid procedures may include: <ul style="list-style-type: none"> e.1. explosion injuries e.2. burns e.3. poisons and envenomation e.4. hypothermia and hyperthermia f. Medicine resources may include: <ul style="list-style-type: none"> f.1. vessel's medicine cabinet f.2. first aid boxes f.3. emergency first aid carry bags
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Sections of relevant maritime regulations dealing with the administration of medical first aid on board a vessel a.2. International Medical Guide for Ships a.3. Medical Section of the 'International Code of Signals' a.4. Medical First Aid Guide for Use in Accidents involving Dangerous Goods a.5. Marine Drug Guide a.6. vessel's log a.7. vessel medical records a.8. shipboard patients' health records a.9. drug register a.10. instructions of relevant maritime, health and quarantine authorities related to the medical care of crew and passengers on board a vessel

Range Of Variables (continued)

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. the Australian USL Code a.4. relevant international, Australian and State/Territory health and quarantine regulations a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Identify and prioritise the need for medical first aid in life-threatening medical emergencies a.2. Administer medical first aid on board a vessel a.3. Administer critical first aid procedures as directed from shore-based medical advisers a.4. Manage medicine resources on board a vessel a.5. Communicate effectively with others during medical emergencies and health care a.6. Maintain medical records in accordance with company and regulatory requirements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant sections of maritime regulations b. ISM Safety Management System procedures (where applicable) c. Emergencies, injuries and medical problems that may occur on board a vessel and appropriate action, treatments and solutions d. Relevant OH&S and health legislation and policies e. Duties and responsibilities of the designated first aid officer on board a vessel f. Medical first aid procedures g. DRABC action plans for various first aid situations h. Shipboard procedures for: <ul style="list-style-type: none"> h.1. conducting an initial patient first aid assessment h.2. managing injuries h.3. managing medical emergencies h.4. carrying out resuscitation techniques h.5. managing medicine resources i. Techniques for care of wounds j. Ways in which disease can spread on board a vessel and ways of preventing the spread k. Legal issues related to the administration of drugs and medicines on board a vessel l. Knowledge of body structures and functions relevant to possible injury, illnesses and disease that may be encountered on board a vessel m. Maritime communication techniques related to health care and receiving radio medical advice from shore-based advisers n. Marine publications containing information on first aid and medical treatment on board a vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to provide first aid to injured or ill crew and passengers and/or b. assist in the real or simulated medical first aid procedures on board an operational vessel <p><i>Note:</i> Simulated first aid situations and assessments may require access to resuscitation mannequins, auxiliary resuscitation items, disposable gloves, bandages, pads, gauzes, slings, water squeeze bottle or tap, pictures of venomous animals/insects or preserved specimens, and blankets pillows and towels</p>

Evidence Guide (continued)

APPLY MEDICAL FIRST AID ON BOARD A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 providing medical care on board a vessel a.2 identifying and evaluating medical problems and emergencies and taking appropriate courses of action a.3 identifying and implementing improvements to medical care on board a vessel a.4 applying aseptic and other precautionary techniques when carrying out medical procedures on board a vessel a.5 assessing operational capability of vessel and manoeuvring plant and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 Relevant maritime regulations b.2 OHS regulations and medical care policies and procedures b.3 relevant medical and first aid instructions b.4 shipboard safety procedures <p>c. Action taken promptly to report and/or rectify injuries and medical incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3	1	3	2

TDM MF19 01A OPERATE LIFE-SAVING APPLIANCES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to operate life-saving appliances and equipment, including survival craft and rescue boats, their launching appliances and arrangements, and their equipment such as radio, life saving equipment, satellite EPIRBs, SARTs, immersion suits and thermal protective aids. It also includes skills and knowledge to organise abandon vessel drills in accordance with accepted practices, standards and emergency procedures.

The unit is consistent with the related functional standard in Sections A II/2 and III/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5 Appendices 2 and 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Launch and operate survival craft and rescue boats</p>	<ul style="list-style-type: none"> a. Preparations for the launch of survival craft or rescue boat are made in accordance with vessel's procedures and manufacturer's directions b. An appropriate launch strategy is adopted following an assessment of weather and sea conditions and the nature of the emergency situation c. Launching equipment is operated in accordance with vessel's instructions and accepted nautical practice d. Survival craft is launched smoothly in accordance with vessel's instructions and regulatory requirements e. Pre-start checks are made on the engine of the survival craft f. The survival craft engine is started using the sequence of actions provided in vessel' procedures and manufacturer's instructions g. Orders are given for survivors to board the survival craft using the appropriate means h. The survival craft is cleared of the vessel and operated in accordance with manufacturer's instructions and accepted nautical practice i. Appropriate handling strategies are applied to manoeuvre the survival craft in rough weather and sea conditions j. Sea anchors and drogues are deployed in accordance with accepted nautical practice k. Survivors displaying signs of hypothermia or other distress are identified and treated in accordance with accepted survival medical practice l. Exposure cover is deployed on an open lifeboat in accordance with accepted survival practice and manufacturer's instructions m. Strategies are adopted and implemented to counter threats to survival following the abandonment of a vessel in accordance with accepted survival practice n. Food and water is rationed to survivors in accordance with accepted survival practice
<p>2. Operate life saving and survival equipment</p>	<ul style="list-style-type: none"> a. Location and accessibility of all life-saving and survival equipment is established b. Survival equipment is checked and operated in accordance with instructions and accepted survival practice c. Survival radio equipment is operated in accordance with manufacturer's instructions and regulatory protocols d. Immersion suit, various thermal protective aids, life-jacket and other life-saving clothing are correctly donned and used in accordance with instructions e. Faulty life-saving equipment is identified and reported to enable prompt repair and/or replacement

<p>3. Recover survival craft</p>	<ul style="list-style-type: none"> a. Persons are disembarked from the survival craft in accordance with vessel's procedures b. The survival craft is recovered using the sequence of actions provided in vessel' procedures and manufacturer's instructions c. Survival craft is checked for signs of damage d. Identified damage or faulty equipment on the survival craft is reported in accordance with vessel's procedures
<p>4. Participate in abandon vessel drills</p>	<ul style="list-style-type: none"> a. Participation in organisation and conduct of abandon vessel musters and drills is consistent with regulatory requirements and company procedures b. Instruction is provided to others, when required, on the correct use of life-saving equipment and procedures to be followed in the event of the order to abandon vessel c. Documentation on the checking and replenishment of consumable materials used in life saving, fire detection, fire fighting and other safety system is completed in accordance with company procedures and regulatory requirements

Range Of Variables

OPERATE LIFE-SAVING APPLIANCES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of established maritime survival principles and practices to the launching and operation of survival craft, the use of survival equipment and the regular involvement in 'abandon vessel drills'. Implementation of established survival strategies and procedures is involved. Limited accountability and responsibility for self and others in achieving the outcomes is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Launching and operation of survival craft and equipment may take place: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. while hove to b.5. while anchored or moored b.6. in appropriately simulated situations c. Survival craft may include: <ul style="list-style-type: none"> c.1. free-fall life boats c.2. davit-launched life-boats c.3. life rafts c.4. rescue boats d. Life-saving and survival equipment may include: <ul style="list-style-type: none"> d.1. life jackets d.2. life buoys d.3. hard hats d.4. immersion suits and other thermal protective aids d.5. rocket line throwing appliances d.6. pyrotechnic distress signals d.7. GMDSS survival craft VHF radios d.8. Satellite emergency position indicating radio beacons EPIRBs d.9. SARTs d.10. whistles e. Consumable materials and items that may used in life saving equipment may include: <ul style="list-style-type: none"> e.1. batteries for detectors, radios, beacons, etc. e.2. flares e.3. survival rations f. In-water survival techniques may include: <ul style="list-style-type: none"> f.1. swimming in a life-jacket f.2. towing with a life jacket f.3. remaining afloat without a life jacket f.4. donning a life jacket in water f.5. the group huddle f.6. heat escape lessening posture g. Threats to survival after abandoning vessel may include: <ul style="list-style-type: none"> g.1. cold water shock g.2. hypothermia g.3. psychological response to disaster g.4. loss of will to live g.5. sea sickness g.6. dehydration g.7. injuries g.8. starvation

Range Of Variables (continued)

OPERATE LIFE-SAVING APPLIANCES

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. Relevant maritime regulations a.2. ISM Code safety management system plans, procedures, checklists and instructions (where applicable) a.1. SOLAS regulations a.2. AMSA publication 'Survival at Sea – a Training and Instruction Manual' a.3. vessel's log a.4. instructions from official search and rescue authorities a.5. vessel's procedures for emergency response including abandoning vessel a.6. manufacturer's instructions for the use of survival craft and equipment a.7. instructions of relevant Maritime Authorities related to survival at sea a.8. relevant OH&S legislation, codes of practice, policies and procedures a.9. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention dealing with survival at sea and use of survival craft and equipment a.2. relevant sections of AMSA Marine Orders dealing with survival at sea and use of survival craft and equipment a.3. relevant sections of the Australian USL Code dealing with survival at sea and use of survival craft and equipment a.4. Safety of Life at Sea (SOLAS) regulations a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

OPERATE LIFE-SAVING APPLIANCES

1. Critical aspects of evidence to be considered	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none">a.1. Launch and operate the various types of survival craft in suitably simulated situationsa.2. Operate and use the various types of survival equipment in suitably simulated situationsa.3. Participate in abandon vessel musters and drillsa.4. Communicate effectively with others as required when operating survival craft and ancillary survival equipment
2. Interdependent assessment of units	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of an officer or integrated rating.</p>
3. Required knowledge and skills	<ul style="list-style-type: none">a. Knowledge of relevant maritime regulationsb. ISM Code safety management system plans, procedures, checklists and instructions (where applicable)b. Relevant OH&S legislation and policiesc. SOLAS regulationsd. Procedures and sequences of action for (1) launching, (2) carrying out pre-start engine checks and (3) operating survival craft and rescue boats in a variety of sea and weather conditionse. Construction, outfit and particular characteristics of various types of life boats, life rafts and rescue boatsf. Typical manoeuvring and engine characteristics for survival craft including handling strategies to overcome hazards caused by a head sea, a following sea and a beam seag. Ways of maximising detectability and location of survival craft using pyrotechnic distress signals, portable VHF radios, Satellite EPIRBs and SARTsh. Procedures for correctly operating and using lifesaving appliances and personal safety equipment on board vessels and survival craft and specifically<ul style="list-style-type: none">h.1. donning a life jacket and using a life jacket light and whistleh.2. donning an immersion suith.3. deployment of a mob combination light and smoke floath.4. use of hand-held pyrotechnicsi. Initial actions for survival on abandonment of vessel as summarised in maritime survival publications such as the AMSA publication 'Survival at Sea – a Training and Instruction Manual'j. Emergency muster and abandon vessel signalsk. Incidents that may result in an emergency on board vessel and the appropriate response in each casel. Threats to survival on abandonment of a vessel and appropriate strategies for countering these threatsm. Procedures for emergency response on board vessels including abandoning vesseln. Threats to survival on abandonment of a vessel and appropriate strategies for countering these threatso. Procedures for the rationing of food and water in survival craftp. Symptoms of hypothermia, its prevention and treatment and the related use of protective covers and garments such as immersion suits and thermal protective aidsq. IMO safety symbols

Evidence Guide (continued)

OPERATE LIFE-SAVING APPLIANCES

<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to launch and operate survival craft and equipment, and/or a.2. organise and conduct abandon vessel musters and drills in appropriately simulations of maritime conditions a.3. assist in the launch and operate survival craft and equipment during emergency response simulations and drills on board an operational commercial or training vessel <p><i>Note:</i> Simulated first aid situations and assessments may require access to open and enclosed life boat fittings and equipment, on-load release gear training aid, open life boat and davit, life boat and rescue boat equipment, life jackets and hard hats, davit launched life raft and davit, inflatable throw over life raft, cradle and hydrostatic release, life boat/life raft boarding ladders, foul weather gear, training pool with jumping platform or equivalent, immersion suits, a selection of shipboard life saving, alerting and detection equipment typically found on vessels.</p> <p>Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian standards. At least one assessor must hold a current life saving qualification appropriate for in-water training and assessment exercises</p>
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 participating in simulated emergency response musters and drills a.2 launching and operating survival craft and ancillary survival equipment a.3 applying safety precautions relevant to survival operations a.4 assessing operational capability of survival craft and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated ship's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 accepted survival procedures and maritime survival practice b.5 relevant manufacturer's guidelines relating to the operation and use of survival craft and equipment, including instructions on equipment capability and limitations c. Action taken promptly to report and/or rectify problems in the launching and operation of survival craft and equipment in accordance with established procedures d. Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	2	2	1	1	2

TDM MF20 01A PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to prevent, control and fight fires on board a commercial vessel, including management of fire prevention measures, initiation and management of evacuation, emergency shutdown and isolation procedures, and the execution and coordination of fire-fighting operations for the type and size of vessel involved. The unit includes skills and knowledge to fight fires involving oil systems.

The unit is consistent with the related functional standard in Sections A II/2 and III/1 of the STCW Code, AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage fire prevention procedures</p>	<ul style="list-style-type: none"> a. Fire hazards on board a vessel are identified and action is taken to eliminate or minimise them b. Fire prevention equipment and systems are regularly checked and appropriate action is taken to ensure that they are operational c. Appropriate educational activities are organised to ensure on-board personnel are aware of the dangers of fire, how to prevent it and what to do if a fire is detected d. Personnel on board a vessel are made aware of emergency procedures to be followed in the event of fire
<p>2. Operate portable fire-fighting equipment</p>	<ul style="list-style-type: none"> a. A, B and C classes of fires are correctly identified in accordance with accepted fire-fighting practice b. Correct portable fire-fighting equipment is selected and used to fight specific classes of fires c. Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice d. Correct techniques are applied for the use of hose lines to extinguish fires on board a vessel e. Correct techniques are applied for the setting up of foam making equipment to extinguish B Class fires on board vessel f. Where applicable, correct techniques are used to recharge the various types of portable fire extinguisher g. Where applicable, portable fire-fighting equipment is confirmed as operational following recharging
<p>3. Conduct interior search and rescue and fire-fighting operations (where applicable.)</p>	<ul style="list-style-type: none"> a. Procedures for donning and starting up SCBA are correctly applied b. Procedures for the logging of SCBA operators on a BA Control Board is correctly followed in accordance with vessel's procedures and accepted fire-fighting practice c. Search and rescue operations in a smoke filled environment are correctly conducted as a member of a fire-fighting team in accordance with accepted fire-fighting practice d. Interior fires are extinguished using appropriate fire fighting equipment and procedures as a member of a fire-fighting team in accordance with accepted fire-fighting practice e. Lifeline signals are correctly used during interior fire-fighting operations f. A compartment filled with high expansion foam is correctly entered as per accepted fire-fighting practice

Range Of Variables

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed as a member of a team under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of accepted principles and practice to the prevention and fighting of fire on board vessel. Participation as a member of a fire-fighting team is involved. c. Work requires significant judgement and teamwork in the execution of measures and procedures for the prevention and fighting of fires that may occur on vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Fires on board vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of fires which may occur on board vessel include Classes A, B, C and F in the standard classification of fires d. Fire detection and fire-fighting systems applicable will depend on the type of vessel concerned and may include: <ul style="list-style-type: none"> d.1. fire detection devices and systems d.2. portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam d.3. fire blankets d.4. CO₂ fixed systems d.5. foam installations including semi-portable and fixed systems d.6. sprinkler systems d.7. fire pumps – main and emergency fire pump d.8. fire hoses, hydrants, branches and international shore connection e. Consumable materials and items that may used in fire detection and fire fighting equipment may include: <ul style="list-style-type: none"> e.1. Dry and wet chemicals used in fire extinguishers e.2. Batteries for fire detectors
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. vessel's log a.3. fire-detection, fire- fighting and safety equipment operational and maintenance instructions and recommended procedures a.4. instructions of relevant Maritime Authorities related to the maintenance and serviceability of vessel-board fire-detection, fire- fighting and safety equipment and systems a.5. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of Australian USL Code and AMSA Marine Orders a.3. Australian and international regulations for the maintenance of to fire-detection, fire- fighting and safety equipment and systems a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Manage and implement fire prevention measures and procedures on board a vessel a.2. Assess the operational capability of fire-detection and fire-fighting equipment and systems and initiate any required maintenance or replenishment action a.3. Use and recharge the various types of portable fire extinguishers typically used on board a vessel a.4. Participate in interior search and rescue and fire-fighting teams (where applicable) a.5. Implement OHS principles and policies when carrying out fire prevention and fire-fighting duties a.6. Communicate effectively with others as required during fire prevention activities and fire emergencies
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of marine officers with a responsibility to prevent, control and fight fires onboard a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. The chemistry of fire and its relationship to materials typically carried on vessels c. Principles underlying the spread of fire and its extinguishment d. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment e. Types of fire-detection, fire-fighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance f. Fire-fighting techniques applicable to different classes of fire on board a vessel g. Relevant regulations, codes of practice, policies and procedures related to the to the maintenance of fire-detection, fire-fighting equipment and systems h. Methods for checking and replacing consumable materials in typical fire-detection and fire-fighting equipment and systems on board various types and sizes of vessels i. Role and function of standard fire-fighting organisation models used on board vessels j. Maritime communication techniques applicable to fire prevention and fire-fighting activities on board a vessel k. Problems that can occur with fire-detection and fire-fighting equipment and operations on board a vessel and appropriate reporting and remedial action and solutions l. Sources of information on fire prevention and extinguishment on board vessels
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire prevention strategies and participate in interior search and rescue and fire-fighting teams on board vessels, and/or b. assist in fire prevention management procedures and fire-fighting drills on board an operational vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards.</p>

Evidence Guide (continued)

PREVENT, CONTROL AND FIGHT FIRES ON BOARD A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 managing the implementation of fire prevention measures and procedures a.2 identifying and evaluating fire fighting problems and determining appropriate courses of action a.3 participating as a member of an interior search and rescue and fire-fighting team on board vessel a.4 assessing the operational capability of fire-detection and fire- fighting equipment and systems and taking any required maintenance or replenishment action <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant manufacturer's guidelines relating to the use of fire-detection and fire- fighting equipment and systems, including instructions on equipment capability and limitations b.5 following on-board housekeeping processes and fire-hazard prevention measures b.6 fire prevention procedures and policies <p>c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection and fire- fighting, equipment and systems</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	1	3	3

TDM MF21 01A CONTROL SAFE ACCESS TO AND ON VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to control and manage the access of persons to and on a commercial vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage). This includes the rigging of personnel and pilot access ways, the managing of personnel aloft or over the side and access to confined places on the vessel.

The unit is consistent with the related functional standard in Section A II/3 of the STCW 95 Code and the related sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Rig personnel and pilot access ways	<ul style="list-style-type: none"> a. Preparations for the rigging of access equipment and facilities are made in accordance with ship's procedures and manufacturer's directions b. Equipment and facilities are deployed in accordance with ship's procedures and manufacturer's directions c. Safety checks and precautions are carried out in accordance with OHS requirements and company procedures d. Defective equipment is identified and reported, repaired or replaced in accordance with company procedures e. Persons accessing the vessel are advised and instructed on the procedures for using access equipment f. Access of persons to and from the vessel is monitored and any problems identified and resolved or reported g. Access equipment and facilities are de-rigged and stowed after use
2. Manage safety of personnel aloft and over side of vessel	<ul style="list-style-type: none"> a. Personnel going aloft or over side are checked for competence in the required procedures b. Where required, personnel are instructed in the procedures and safety precautions to be followed when working aloft or over side c. Equipment for going aloft or over side is rigged and checked prior to operations commencing d. Immersion suit, various thermal protective aids, life-jacket and other life-saving clothing are correctly donned where required and used in accordance with instructions e. Faulty operational and safety equipment is identified, isolated and reported to enable prompt repair and/or replacement f. Operations of persons aloft or over side of the vessel are monitored and any problems identified and resolved or reported g. Safety incidents arising in the course of work aloft or over side are reported and recorded in accordance with statutory requirements and company procedures

3. **Control access of persons to confined spaces on vessel**
- a. Personnel accessing and working in confined space are checked for competence in the required procedures
 - b. Where required, personnel are instructed in the procedures and safety precautions to be followed when working in confined spaces
 - c. Protective safety equipment and clothing are correctly donned where required and used in accordance with instructions
 - d. Faulty safety equipment and clothing is identified, isolated and reported to enable prompt repair and/or replacement
 - e. Operations of persons in confined spaces on the vessel are monitored and any problems identified and resolved or reported
 - f. Safety incidents arising in the course of work in confined spaces are reported and recorded in accordance with statutory requirements and company procedures

Range Of Variables

CONTROL SAFE ACCESS TO AND ON VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. c. Work involves the control of access of passengers, crew and others to and on vessel and the application of solutions to a defined range of unpredictable access problems. Planning and administering the access of persons to and on the vessel is required. d. Work requires limited responsibility for the control of the access of passengers, crew and others to and on vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Ship may include a commercial vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3,000 gross tonnage) to ACMW b. Access to and on ship may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. while hove to b.5. while anchored or moored b.6. in appropriately simulated situations c. Personnel and pilot access ways may include: <ul style="list-style-type: none"> c.1. accommodation ladders c.2. gangways c.3. brows c.4. man baskets c.5. cargo ramps c.6. helicopter access c.7. pilot ladders c.8. pilot hoists d. Safety equipment may include: <ul style="list-style-type: none"> d.1. harness d.2. bosun's chair d.3. breathing apparatus d.4. immersion suits d.5. life jacket d.6. snorkel equipment d.7. goggles d.8. face mask d.9. head gear d.10. gloves d.11. boots d.12. eye and ear protection

Range Of Variables (continued)

CONTROL SAFE ACCESS TO AND ON VESSEL

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. Sections of the IMO STCW Code and Convention related to a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) a.2. relevant sections of Australian USL Code a.3. relevant sections of AMSA Marine Orders a.4. procedures for operating aloft, over side or in confined spaces a.5. procedures for rigging and de-rigging access equipment and facilities a.6. instructions to persons accessing the vessel a.7. relevant international, Australian and State/Territory OH&S legislation
<p>4. Workplace context</p>	<p>Workplace organisation may be defined by:</p> <ul style="list-style-type: none"> a. Company work organisation procedures and practices b. Conditions of service, industrial legislation and agreements including: <ul style="list-style-type: none"> b.1. workplace agreements and awards b.2. Australian and State/Territory industrial legislation
<p>5. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. Sections of the IMO STCW 95 Code and Convention related to a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) a.2. relevant sections of Australian USL Code a.3. relevant sections of AMSA Marine Orders a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

CONTROL SAFE ACCESS TO AND ON VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <p>a.1. Launch and operate the various types of survival craft typically found on a commercial vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) in suitably simulated situations</p> <p>a.2. Operate and use the various types of survival equipment typically found a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage) in suitably simulated situations</p> <p>a.3. Organise and conduct abandon ship musters and drills</p> <p>a.4. Communicate effectively with others as required when operating survival craft and ancillary survival equipment</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of an officer in charge of a navigational watch on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<p>a. Knowledge of relevant maritime regulations</p> <p>b. Relevant OH&S legislation and policies</p> <p>c. SOLAS regulations</p> <p>d. Procedures and sequences of action for (1) launching, (2) carrying out pre-start engine checks and (3) operating survival craft and rescue boats typically found on a ship of 500gross tonnage or more in a variety of sea and weather conditions</p> <p>e. Construction, outfit and particular characteristics of various types of life boats, life rafts and rescue boats</p> <p>f. Manoeuvring and engine characteristics for survival craft including handling strategies to overcome hazards caused by a head sea, a following sea and a beam sea</p> <p>g. Ways of maximising detectability and location of survival craft using pyrotechnic distress signals, portable VHF radios, Satellite EPIRBs and SARTs</p> <p>h. Procedures for correctly operating and using lifesaving appliances and personal safety equipment on board ships and survival craft and specifically</p> <p>h.1. donning a life jacket and using a life jacket light and whistle</p> <p>h.2. donning an immersions suit</p> <p>h.3. deployment of a mob combination light and smoke float</p> <p>h.4. use of hand-held pyrotechnics</p> <p>i. Initial actions for survival on abandonment of ship as summarised in maritime survival publications such as the AMSA publication 'Survival at Sea – a Training and Instruction Manual'</p> <p>j. Emergency muster and abandon ship signals</p> <p>k. Typical incidents that may result in an emergency on board ship and the appropriate response in each case</p> <p>l. Threats to survival on abandonment of a ship and appropriate strategies for countering these threats</p> <p>m. Procedures for emergency response on board ships including abandoning ship</p> <p>n. Threats to survival on abandonment of a ship and appropriate strategies for countering these threats</p> <p>o. Procedures for emergency response on board ships including abandoning ship</p> <p>p. Procedures for the rationing of food and water in survival craft</p> <p>q. Symptoms of hypothermia, its prevention and treatment and the related use of protective covers and garments such as immersion suits and thermal protective aids</p> <p>r. IMO safety symbols</p>

Evidence Guide (continued)

CONTROL SAFE ACCESS TO AND ON VESSEL

<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ol style="list-style-type: none"> carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to rig and de-rig access equipment and facilities typically used on board a commercial vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3,000 gross tonnage), and/or rig and de-rig various types of access equipment and facilities in appropriately simulations of maritime conditions and/or assist in the rigging and de-rigging of various types of access equipment and facilities on board an operational commercial or training ship and/or control the working of persons aloft, over side or in confined spaces in appropriately simulations of maritime conditions and/or control the working of persons aloft, over side or in confined spaces on board an operational commercial or training ship s <p><i>Note:</i> Simulated situations and assessments may require access to appropriate access and safety equipment and facilities typically found on a vessel up to 35m in length on international voyages or up to 80m in length on coastal voyages (or 100m in length where gross tonnage does not exceed 3000 gross tonnage)</p> <p>Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian standards. At least one assessor must hold a current life saving qualification for training and assessment exercises</p>
<p>5. Consistency in performance</p>	<ol style="list-style-type: none"> Applies underpinning knowledge and skills when: <ol style="list-style-type: none"> Organising and conducting simulated emergency response musters and drills launching and operating survival craft and ancillary survival equipment applying safety precautions relevant to survival operations assessing operational capability of survival craft and equipment Shows evidence of application of relevant workplace procedures including: <ol style="list-style-type: none"> relevant maritime regulations OHS regulations and hazard prevention policies and procedures accepted survival procedures and maritime survival practice manufacturer's guidelines relating to the operation and use of survival craft and equipment, including instructions on equipment capability and limitations Action taken promptly to report and/or rectify problems in the launching and operation of survival craft and equipment in accordance with established procedures Work is completed systematically with required attention to detail
<p>6. Context for assessment</p>	<ol style="list-style-type: none"> Assessment of competence must comply with the assessment requirements of the relevant maritime regulations Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ol style="list-style-type: none"> As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations Appropriate practical assessment must occur: <ol style="list-style-type: none"> at the registered training organisation, and/or on an appropriate working or training vessel

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	3	2	3	1	2	1

TDM MF23 01A OPERATE EMERGENCY EQUIPMENT AND APPLY EMERGENCY PROCEDURES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to operate emergency equipment and apply emergency procedures, including taking appropriate initial action on becoming aware of an emergency, maintaining the integrity of emergency and distress alerting systems, avoidance of false distress alerts and operating emergency equipment in conformity with established practices and procedures.

The unit is consistent with the related functional standard in Section A II/4 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 4 and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Apply emergency procedures	<ul style="list-style-type: none"> a. Emergency situations are correctly identified in accordance with established nautical practice b. Initial action on becoming aware of an emergency or abnormal situation is in conformity with established practices and procedures c. Action taken is timely and appropriate for seriousness of the emergency and the prevailing weather and sea conditions d. Communications are clear and concise at all times and orders are acknowledged in a timely and seamanlike manner e. False distress alerts are avoided through the application of established nautical practice f. Appropriate action is taken in the event of accidental activation of a distress alert in accordance with regulatory requirements and vessel's procedures
2. Maintain the integrity of emergency and distress alerting systems	<ul style="list-style-type: none"> a. Emergency and distress alerting systems are used in accordance with manufacturer's instructions and vessel's procedures b. The integrity of emergency and distress alerting systems is maintained in accordance with vessel and company procedures, manufacturer's instructions and regulatory requirements c. Faulty or non-operational emergency and distress alerting equipment is identified, reported and/or replaced as per manufacturer's instructions and vessel's procedures

Range Of Variables

OPERATE EMERGENCY EQUIPMENT AND APPLY EMERGENCY PROCEDURES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the maritime regulations. b. Work is performed within defined emergency procedures with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of basic emergency procedures and the use of emergency equipment on board a vessel. Taking of immediate action in accordance with company procedures and limits of responsibility is required. d. Work requires some judgement in recognising and confirming the nature and extent of the emergency and taking appropriate initial action within the established limits of responsibility.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Potential emergencies may occur: <ul style="list-style-type: none"> b.1. by day or night b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Emergencies may include: <ul style="list-style-type: none"> c.1. collision with another vessel c.2. explosion on board vessel c.3. fire on board vessel c.4. impairment of integrity of hull and ingress of water c.5. loss of steering control c.6. loss of motive power c.7. foundering c.8. grounding c.9. person overboard c.10. rescue and evacuation of injured personnel d. Emergency and distress alerting systems may include: <ul style="list-style-type: none"> d.1. pyrotechnic distress signals d.2. GMDSS survival craft VHF radios d.3. satellite emergency position indicating radio beacons (EPIRBs) d.4. search and rescue transponders (SARTs) d.5. whistles
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations dealing with emergency equipment and procedures a.2. SOLAS regulations a.3. AMSA publication 'Survival at Sea – a Training and Instruction Manual' a.4. instructions from official search and rescue authorities a.5. vessel's procedures for emergency response a.6. vessel's safety management system plans, procedures, checklists and instructions (where applicable) a.7. manufacturer's instructions for the use of emergency and distress alerting systems a.8. instructions of relevant Maritime Authorities related to survival at sea a.9. relevant OH&S legislation, codes of practice, policies and procedures a.10. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the IMO STCW 95 Code, the Australian USL Code and/or AMSA Marine Orders (dependent on the type of vessel and the role of the person concerned) a.2. Safety of Life at Sea (SOLAS) Convention a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

OPERATE EMERGENCY EQUIPMENT AND APPLY EMERGENCY PROCEDURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Recognise emergency or abnormal situations a.2. Take appropriate initial action on becoming aware of an emergency or abnormal situation a.3. Operate emergency equipment a.4. Maintain the integrity of emergency and distress alerting systems a.5. Communicate clearly, concisely and effectively with others during an emergency onboard vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations dealing with emergency equipment and procedures b. ISM Code and associated ship's Safety Management System and procedures (where applicable) c. Relevant OH&S legislation and policies applicable to the use of emergency equipment d. SOLAS Convention and related regulations e. Duties and responsibilities of shipboard personnel during emergencies f. Procedures for emergency response on board a commercial vessel g. Incidents that may result in an emergency on board vessel and the appropriate response in each case h. Functions and purpose of pyrotechnic distress signals, satellite emergency position indicating radio beacons (EPIRBs), and search and rescue transponders (SARTs) i. Precautions to maintain the integrity of emergency and distress alerting systems j. The meaning of various maritime emergency alarms, the guidelines and procedures for their activation and signals and the action to be taken when they are activated k. Techniques for avoiding false distress alerts and the action that must be taken in the event of accidental activation l. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to respond to emergencies on board a vessel, and/or b. participate in emergency response drills on board an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 responding to a real or simulated emergency situation a.2 taking appropriate initial action on becoming aware of an emergency or abnormal situation a.3 applying safety precautions relevant to emergency procedures a.4 maintaining the integrity of emergency and distress alerting systems b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 established emergency procedures b.4 vessel's safety management procedures b.5 relevant manufacturer's guidelines relating to the operation and use of emergency equipment, including instructions on equipment capability and limitations c. Action taken promptly to report and/or act upon an emergency or abnormal situation on board vessel d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

OPERATE EMERGENCY EQUIPMENT AND APPLY EMERGENCY PROCEDURES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	1

TDM MF26 01A ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to establish and maintain bridge and engine room watchkeeping arrangements in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of a commercial vessel and persons on board.

The unit is consistent with the related functional standard in Sections A II/2 and AIII/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2 and Appendix 3.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Establish bridge/engine room working systems and procedures</p>	<ul style="list-style-type: none"> a. Watchkeeping arrangements and procedures are established as required by AMSA Marine Orders and company procedures taking into account relevant factors b. The principles of Bridge Resource Management (BRM) are appropriately applied in the establishment of watchkeeping arrangements and procedures and the development of an effective Bridge Working System c. Composition of the watch is determined in accordance with the principles set out in AMSA Marine Orders d. Bridge/engine room working systems is documented as required and communicated to bridge personnel
<p>2. Manage the bridge/engine room teams</p>	<ul style="list-style-type: none"> a. The current competence of personnel is evaluated and appropriate measures are taken to ensure all personnel have the required level of competence b. Personnel are assigned in accordance with their assessed level of current competence and experience and established bridge watchkeeping requirements c. Watchkeeping arrangements and procedures are explained to assigned watch officers and other bridge personnel and their duties and responsibilities confirmed d. Fatigue management strategies are applied within the bridge/engine room management team e. Watchkeeping operations are monitored and appropriate action is taken where they are found to be in breach of established arrangements, regulations and procedures

Range Of Variables

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations b. Work is performed independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental nautical principles and complex manoeuvring techniques across a wide and often unpredictable variety of operational contexts. Planning, establishment and maintenance of watchkeeping arrangements is required. Accountability and responsibility for self and others in achieving the required watchkeeping functions is involved. d. Work requires significant judgement in planning, organisational and leadership functions related to the establishment of watchkeeping arrangements and procedures for commercial vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of unlimited tonnage or propulsion power b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor b.8. when bunkering b.9. during cargo operations c. Watchkeeping includes both navigational and engine room watchkeeping duties d. Watchkeeping principles (as described in the AMSA Marine Orders Section 28, Appendix 3, Sections 3.3.4 and 3.4) include: <ul style="list-style-type: none"> d.1. proper lookout must be maintained at all times d.2. duties of look out and helmsman must be kept separate d.3. look-out must give full attention to keeping a proper look out and must not be given other duties which could interfere with the task d.4. all necessary precautions must be taken to avoid pollution of the marine environment d.5. assistance must be available to be summoned to the bridge if required by a change in the vessel's situation e. Fatigue management strategies may include: <ul style="list-style-type: none"> e.1. recognition of symptoms of fatigue e.2. arranging to take a break when symptoms of fatigue are identified e.3. maintenance of personal fitness and health e.4. appropriate dietary habits e.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties f. Factors to be taken into account when establishing watchkeeping arrangements include: <ul style="list-style-type: none"> f.1. bridge must never be left unattended f.2. weather and sea conditions, visibility and whether there is daylight or darkness f.3. proximity of navigational hazards f.4. use and operational condition of navigational aids f.5. the operational status of bridge instrumentation, controls and alarms f.6. whether the vessel is fitted with an automatic steering system f.7. whether there are radio duties to be performed f.8. provision of unmanned machinery space (UMS) controls, alarms and indicators f.9. unusual demands on the watch arising from operational conditions f.10. traffic density and other activities occurring in the area in which the vessel is navigating f.11. the size of the vessel and the field of vision available from the conning position f.12. the attention necessary when navigating in or near traffic separation schemes or other routing measures f.13. the professional competence and experience of the vessel's officers and crew and their familiarity with the vessel's equipment, procedures, and manoeuvring capability f.14. the fitness for duty of any crew members on call who are assigned as members of the watch f.15. rudder and propeller control and vessel manoeuvring characteristics f.16. the additional workload caused by the nature of the vessel's functions, immediate operating requirements and anticipated manoeuvres

Range Of Variables (continued)

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

VARIABLE	SCOPE
2. Worksite environment (continued)	g. Available navigational aids may include: g.1. radar g.2. electronic position-indicating devices g.3. other equipment affecting the safe navigation of the vessel
3. Sources of information / documents	a. Documentation / records may include a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW 95 Code and Convention a.5. AMSA Marine Orders a.6. ICS Bridge Procedures Guide a.7. vessel's log a.8. company procedures a.9. instructions of relevant Maritime Authorities a.10. pilot instructions where relevant a.11. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. Relevant sections of the IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. ISM Code a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Establish watch keeping arrangements and procedures a.2. Assign watchkeeping responsibilities a.3. Assess current competence of bridge personnel in terms of their watchkeeping roles and responsibilities a.4. Monitor watchkeeping procedures a.5. Communicate effectively with others concerning watchkeeping arrangements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master or chief engineer of a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of IMO STCW Convention and Codes and AMSA Marine Orders dealing with watchkeeping principles, arrangements, procedures, roles and responsibilities b. Relevant OH&S legislation and policies c. Bridge Resource Management systems d. Implications of a range of factors that can affect watchkeeping functions and the composition of the bridge engine room management team e. Causes of groundings, collisions and casualties when on board a vessel f. Navigational hazards and implications for watchkeeping g. Operating procedures for typical navigational aids and skills and knowledge needed to use them effectively h. Watch handover procedures i. Bridge instrumentation, controls and alarms j. Functions of unmanned machinery space (UMS) controls, alarms and indicators k. Ways of assessing the current competence of the vessel's officers and crew and their familiarity with the vessel's equipment, procedures, and manoeuvring capability l. Rudder and propeller control and vessel manoeuvring characteristics m. Precautions necessary when navigating in or near traffic separation schemes or other routing measures n. Signs of fatigue o. Fatigue management principles and techniques p. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate the ability to establish and manage watchkeeping arrangements through a range of case studies, exercises and assignments that suitably-simulate a range of watchkeeping situations for a vessel of 500 gross tonnage or more; and/or b. establish and manage the watchkeeping arrangements on an operational commercial vessel of 500 gross tonnage or more in an appropriate range of situations, weather and loading conditions

Evidence Guide (continued)

ESTABLISH WATCHKEEPING ARRANGEMENTS AND PROCEDURES

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 establishing and monitoring watchkeeping arrangements a.2 identifying and evaluating bridge management problems and determining an appropriate courses of action a.3 identifying and implementing improvements to bridge management procedures a.4 applying safety precautions relevant to watchkeeping operations a.5 assessing competence and experience of vessel's officers and crew and their suitability for watchkeeping roles <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant guidelines relating to bridge management and watchkeeping arrangements on board a vessel b.6 security procedures b.7 following bridge housekeeping processes <p>c. Action taken promptly to report and/or rectify watchkeeping incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF29 01A MAINTAIN A SAFE NAVIGATIONAL WATCH ON A COASTAL VOYAGE

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to maintain a safe navigational watch on a commercial vessel engaged on a coastal voyage in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of the vessel and persons on board.

The unit is consistent with the related functional standard in the Australian USL Code, Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Carry out watchkeeping procedures</p>	<ul style="list-style-type: none"> a. The conduct, handover and relief of the watch conforms with accepted principles and vessel's procedures b. A proper look-out is maintained at all times and in such a way as to conform to accepted principles and procedures and regulatory requirements c. The vessel is navigated safely using appropriate visual and electronic techniques to check position and to keep it on the track laid down d. The progress of the vessel along a prepared track is analysed and speed and course adjusted as appropriate to maintain a required estimated time of arrival at a point on the track e. Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognised f. The frequency and extent of monitoring of traffic, the vessel and the environment conform with accepted principles and procedures g. Responsibility for the safety of navigation is clearly defined at all times, including periods when the master is on the bridge and while under pilotage h. Safe navigational practice is achieved through the implementation of accepted bridge resource management principles and procedures i. Fatigue management strategies are correctly applied within the bridge management team
<p>2. Respond to potential collision and emergency situations</p>	<ul style="list-style-type: none"> a. Potential collision situations are analysed and appropriate action is taken in ample time and in accordance with regulatory requirements b. Correct responses are made to emergencies and situations that pose a danger to the vessel and personnel on board c. Distress signals are recognised and appropriate action is taken to initiate search and rescue procedures d. Master is called in the event of a navigational incident which falls outside the officer's limits of responsibility
<p>3. Maintain watchkeeping records</p>	<ul style="list-style-type: none"> a. A proper and accurate record is maintained of the movements and activities relating to the navigation of the vessel b. Appropriate entries pertaining to the watch are recorded in the vessel's log

Range Of Variables

MAINTAIN A SAFE NAVIGATIONAL WATCH ON A COASTAL VOYAGE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work requires judgement and teamwork in carrying out watchkeeping duties and procedures during a coastal voyage. c. Work is performed as a member of a bridge team under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of nautical principles and watchkeeping techniques across a wide and often unpredictable variety of operational contexts in coastal waters. Implementation of the vessel's watchkeeping plan is required. Limited accountability and responsibility for self and others in achieving the required watchkeeping functions is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel operating within coastal limits b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor b.8. when bunkering b.9. during cargo operations c. Watchkeeping principles include: <ul style="list-style-type: none"> c.1. proper lookout must be maintained at all times c.2. duties of look out and helmsman must be kept separate c.3. look-out must give full attention to keeping a proper look out and must not be given other duties which could interfere with the task c.4. all necessary precautions must be taken to avoid pollution of the marine environment c.5. appropriate assistance must be available to be summoned to the bridge if required by a change in the vessel's situation d. Fatigue management strategies may include: <ul style="list-style-type: none"> d.1. recognition of symptoms of fatigue d.2. arranging to take a break when symptoms of fatigue are identified d.3. maintenance of personal fitness and health d.4. appropriate dietary habits d.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties e. Emergencies and potentially dangerous navigational situations may include: <ul style="list-style-type: none"> e.1. fire e.2. stranding e.3. possible collision e.4. heavy weather e.5. synchronous rolling e.6. distress signal e.7. failure of bridge equipment, steering equipment, navigational lights e.8. loss of main engines e.9. man overboard e.10. fog and restricted visibility e.11. cargo shift e.12. retrieval of survivors from the water e.13. loss of watertight integrity e.14. intoxicated persons on board vessel e.15. dragging anchor e.16. fouled hawse e.17. loss of mooring lines or winches when berthing e.18. entry into confined spaces e.19. personnel working aloft or overside e.20. sudden list or loll f. Available navigational aids may include: <ul style="list-style-type: none"> f.1. Electronic navigation systems and equipment including radar f.2. electronic position-indicating devices f.3. other equipment affecting the safe navigation of the vessel

Range Of Variables (continued)

MAINTAIN A SAFE NAVIGATIONAL WATCH ON A COASTAL VOYAGE

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>g. Factors to be taken into account when carrying out watchkeeping duties include:</p> <ul style="list-style-type: none"> g.1. bridge must never be left unattended g.2. weather and sea conditions, visibility and whether there is daylight or darkness g.3. proximity of navigational hazards g.4. use and operational condition of navigational aids g.5. the operational status of bridge instrumentation, controls and alarms g.6. provision on the bridge of unmanned machinery space (UMS) controls, alarms and indicators g.7. unusual demands on the navigational watch arising from operational conditions g.8. traffic density and other activities occurring in the area in which the vessel is navigating g.9. the size of the vessel and the field of vision available from the conning position g.10. the attention necessary when navigating in or near traffic separation schemes or other routing measures g.11. rudder and propeller control and vessel manoeuvring characteristics
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts a.3. relevant maritime regulations as they relate to watchkeeping functions and operations during a coastal voyage a.4. vessel's log a.5. company procedures a.6. instructions of relevant Maritime Authorities
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. USL Code a.2. IMO STCW 95 Code and Convention a.3. relevant sections of AMSA Marine Orders a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MAINTAIN A SAFE NAVIGATIONAL WATCH ON A COASTAL VOYAGE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement watch keeping arrangements and procedures a.2. Fulfil watchkeeping responsibilities a.3. Take appropriate action in the event of a potential collision or other emergency situation arising during a watch a.4. Communicate effectively with others in the course of watchkeeping duties
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a navigational watch on a coastal voyage.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations dealing with bridge watchkeeping principles, arrangements, procedures, roles and responsibilities b. Relevant OH&S legislation and policies c. Limits of responsibility of an Officer in Charge of a Navigational Watch for various sizes of vessels and operational contexts when engaged on a coastal voyage d. Bridge resource management systems e. Implications of a range of factors that can affect watchkeeping functions f. Causes of groundings, collisions and casualties when on board vessel engaged on a coastal voyage g. Navigational hazards during a coastal voyage and implications for watchkeeping h. Operating procedures for typical navigational aids and skills and knowledge needed to use them effectively i. Watch handover procedures j. Watchkeeping problems and emergency situations for vessels of 500 gross tonnage or more and appropriate action and solutions k. Manual and electronic navigational aids available to the bridge team and the procedures for their operation and use during a watch l. Bridge instrumentation, controls and alarms m. Functions of unmanned machinery space (UMS) controls, alarms and indicators n. Rudder and propeller control and vessel manoeuvring characteristics o. Precautions necessary when navigating in or near traffic separation schemes or other routing measures p. Signs of fatigue q. Fatigue management principles and techniques r. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate the ability to maintain a safe watch in range of suitably-simulated of watchkeeping situations onboard a vessel engaged on a coastal voyage; and/or b. maintain a safe watch on a vessel engaged on a coastal voyage in an appropriate range of situations and weather and sea conditions

Evidence Guide (continued)

MAINTAIN A SAFE NAVIGATIONAL WATCH ON A COASTAL VOYAGE

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 maintaining a safe watch on a vessel engaged on a coastal voyage a.2 identifying and evaluating watchkeeping problems and determining an appropriate courses of action a.3 identifying and implementing improvements to bridge management procedures a.4 applying safety precautions relevant to watchkeeping operations a.5 dealing with potential collisions and other potentially dangerous situations arising during a watch b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Relevant sections of maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant guidelines relating to bridge management and watchkeeping arrangements on board vessel engaged on a coastal voyage b.5 following bridge housekeeping processes c. Action taken promptly to report and/or rectify watchkeeping incidents in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MF30 01A MAINTAIN A SAFE NAVIGATIONAL WATCH

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to maintain a safe navigational watch on a commercial vessel in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of the vessel and persons on board.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Carry out watchkeeping procedures</p>	<ul style="list-style-type: none"> a. The conduct, handover and relief of the watch conforms with accepted principles and vessel's procedures b. A proper look-out is maintained at all times and in such a way as to conform to accepted principles and procedures and regulatory requirements c. The vessel is navigated safely using appropriate visual and electronic techniques to check position and to keep it on the track laid down d. The progress of the vessel along a prepared track is analysed and speed and course adjusted as appropriate to maintain a required estimated time of arrival at a point on the track e. Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognised f. The frequency and extent of monitoring of traffic, the vessel and the environment conform with accepted principles and procedures g. Responsibility for the safety of navigation is clearly defined at all times, including periods when the master is on the bridge and while under pilotage h. Safe navigational practice is achieved through the implementation of accepted bridge resource management principles and procedures i. Fatigue management strategies are correctly applied within the bridge management team
<p>2. Respond to potential collision and emergency situations</p>	<ul style="list-style-type: none"> a. Potential collision situations are analysed and appropriate action is taken in ample time and in accordance with regulatory requirements b. Correct responses are made to emergencies and situations that pose a danger to the vessel and personnel on board c. Distress signals are recognised and appropriate action is taken to initiate search and rescue procedures d. Master is called in the event of a navigational incident which falls outside the officer's limits of responsibility
<p>3. Maintain watchkeeping records</p>	<ul style="list-style-type: none"> a. A proper and accurate record is maintained of the movements and activities relating to the navigation of the vessel b. Appropriate entries pertaining to the watch are recorded in the vessel's log or computer records

Range Of Variables

MAINTAIN A SAFE NAVIGATIONAL WATCH

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed as a member of a bridge team under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental nautical principles and watchkeeping techniques across a wide and often unpredictable variety of operational contexts. Implementation of the vessel's watchkeeping plan is required. Limited accountability and responsibility for self and others in achieving the required watchkeeping functions is involved. d. Work requires judgement and teamwork in carrying out watchkeeping duties and procedures for vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Watchkeeping principles (as described in the AMSA Marine Orders) include: <ul style="list-style-type: none"> c.1. proper lookout must be maintained at all times c.2. duties of look out and helmsman must be kept separate c.3. look-out must give full attention to keeping a proper look out and must not be given other duties which could interfere with the task c.4. all necessary precautions must be taken to avoid pollution of the marine environment c.5. appropriate assistance must be available to be summoned to the bridge if required by a change in the vessel's situation d. Fatigue management strategies may include: <ul style="list-style-type: none"> d.1. recognition of symptoms of fatigue d.2. arranging to take a break when symptoms of fatigue are identified d.3. maintenance of personal fitness and health d.4. appropriate dietary habits d.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties e. Emergencies and potentially dangerous navigational situations may include: <ul style="list-style-type: none"> e.1. Fire e.2. Stranding e.3. Possible collision e.4. Heavy weather e.5. Synchronous rolling e.6. Distress signal e.7. Failure of bridge equipment, steering equipment, navigational lights e.8. Loss of main engines e.9. Man overboard e.10. Fog and restricted visibility e.11. Cargo shift e.12. Ice formation on hull and superstructure e.13. Floating ice e.14. Retrieval of survivors from the water e.15. Loss of watertight integrity e.16. Intoxicated persons on board a vessel e.17. Dragging anchor e.18. Fouled hawse e.19. Loss of mooring lines or winches when berthing e.20. Entry into confined spaces e.21. Personnel working aloft or overside e.22. Sudden list or loll

Range Of Variables (continued)

MAINTAIN A SAFE NAVIGATIONAL WATCH

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>f. Available navigational aids may include:</p> <ul style="list-style-type: none"> f.1. radar f.2. electronic position-indicating devices f.3. other equipment affecting the safe navigation of the vessel <p>g. Factors to be taken into account when carrying out watchkeeping duties include:</p> <ul style="list-style-type: none"> g.1. bridge must never be left unattended g.2. weather and sea conditions, visibility and whether there is daylight or darkness g.3. proximity of navigational hazards g.4. use and operational condition of navigational aids g.5. the operational status of bridge instrumentation, controls and alarms g.6. provision on the bridge of unmanned machinery space (UMS) controls, alarms and indicators g.7. unusual demands on the navigational watch arising from operational conditions g.8. traffic density and other activities occurring in the area in which the vessel is navigating g.9. the size of the vessel and the field of vision available from the conning position g.10. the attention necessary when navigating in or near traffic separation schemes or other routing measures g.11. rudder and propeller control and vessel manoeuvring characteristics
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW 95 Code and Convention a.5. AMSA Marine Orders as they relate to watchkeeping functions and operations a.6. vessel's log a.7. company procedures a.8. instructions of relevant Maritime Authorities a.9. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MAINTAIN A SAFE NAVIGATIONAL WATCH

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement watch keeping arrangements and procedures a.2. Fulfil watchkeeping responsibilities a.3. Take appropriate action in the event of a potential collision or other emergency situation arising during a watch a.4. Communicate effectively with others in the course of watchkeeping duties
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a navigational watch on a commercial vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of IMO STCW 95 Code and Convention and AMSA Marine Orders dealing with bridge watchkeeping principles, arrangements, procedures, roles and responsibilities b. Relevant OH&S legislation and policies c. Bridge resource management systems d. Implications of a range of factors that can affect watchkeeping functions e. Causes of groundings, collisions and casualties f. Navigational hazards and implications for watchkeeping g. Operating procedures for typical navigational aids and skills and the knowledge needed to use them effectively h. Watch handover procedures i. Watchkeeping problems and emergency situations for commercial vessels of 500 gross tonnage or more and appropriate action and solutions j. Principles and use of navigational recording devices for keeping records of the operation, behaviour and performance of the ship and navigation equipment k. Procedures for the use of ship routeing and reporting systems for safe navigation l. Manual and electronic navigational aids available to the bridge team and the procedures for their operation and use during a watch m. Typical bridge instrumentation, controls and alarms and their functions n. Functions of unmanned machinery space (UMS) controls, alarms and indicators o. Rudder and propeller control and vessel manoeuvring characteristics p. Precautions necessary when navigating in or near traffic separation schemes or other routeing measures q. Signs of fatigue r. Fatigue management principles and techniques s. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate the ability to maintain a safe watch in range of suitably-simulated watchkeeping situations, case studies and exercises for a vessel of 500 gross tonnage or more; and/or b. maintain a safe watch on a commercial vessel of 500 gross tonnage or more in an appropriate range of situations and weather and sea conditions

Evidence Guide (continued)

MAINTAIN A SAFE NAVIGATIONAL WATCH

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 maintaining a safe watch a.2 identifying and evaluating watchkeeping problems and determining an appropriate courses of action a.3 identifying and implementing improvements to bridge management procedures a.4 applying safety precautions relevant to watchkeeping operations a.5 dealing with potential collisions and other potentially dangerous situations arising during a watch b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant guidelines relating to bridge management and watchkeeping arrangements on board a vessel b.6 security procedures b.7 following bridge housekeeping processes b.8 waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify watchkeeping incidents in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3

TDM MF32 01A APPLY REGULATIONS WHEN OPERATING A SMALL VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to monitor and control compliance with Australian and international legislative requirements applying to small commercial vessels operating on coastal voyages, including accessing and interpreting current information on the relevant Commonwealth and State and Territory Acts, Legislation, Codes and other publications and applying to vessel operations. It also includes the identification, interpretation and application of information on the responsibilities of vessel's officers and crew under relevant maritime law and the monitoring the compliance of vessel's operations and maintenance with relevant maritime regulations.

The unit is consistent with the relevant sections in the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Access and interpret information on relevant Australian and international legislation, codes and conventions</p>	<ul style="list-style-type: none"> a. Current documentation on applicable maritime regulations is stored and filed in an accessible location on the vessel in accordance with regulations b. Documentation on applicable maritime regulations is updated with relevant publications c. Relevant maritime regulations are accessed and interpreted to confirm the requirements for vessel's operations and maintenance and personal responsibilities d. Certification extensions for the vessel and requirements for renewals are timely and ensure continuous validity e. Survey items and equipment reflect effective programs of tests, checks and maintenance in accordance with certificate conditions f. Arrangements for renewals and surveys are timely and comply with enterprise and issuing authority requirements g. Vessel's documents indicate any effects of damage, alterations or additions to the vessel or operations in accordance with certification requirements and the procedures of the relevant maritime authority h. Procedures are developed to ensure that only authorised personnel access documents i. Certificates and documentation are stored in a manner which enables their use for the prosecution of vessel's business.
<p>2. Ensure operations and maintenance comply with legal requirements</p>	<ul style="list-style-type: none"> a. Interpretations of relevant sections of applicable maritime regulations are applied to day-to-day operations and maintenance of the vessel b. Procedures are followed for monitoring operations and maintenance according to applicable maritime regulations c. Areas and plant equipment are checked and inspected in accordance with planned procedures d. Problems that may lead to potential non-compliance are promptly and fully identified e. Remedial action is timely and ensures compliance with applicable maritime regulations f. Training and instruction on procedures ensures subordinates comply with regulations g. Advice to others on the legitimacy of operations is accurate and given at an appropriate time h. Failure to comply with procedures is identified and dealt with according to established procedures

3. **Monitor and control compliance with applicable maritime regulations**
 - a. Records of compliance are clear concise and accurate
 - b. Records comply with applicable maritime regulations
 - c. The level and detail is sufficient to meet the objectives for maintaining the records
 - d. Documentation is secure and confidentiality is maintained in accordance with established procedures
 - e. Computer backup procedures (where relevant) follow good operating practices and enterprise procedures
 - f. Records and reports are distributed to the required maritime authority at appropriate times and places
 - g. Storage method and duration comply with legal and company requirements.

Range Of Variables

APPLY REGULATIONS WHEN OPERATING A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in the achievement of compliance with the applicable maritime regulations. It involves the monitoring and controlling compliance of a vessel's operational and maintenance procedures in relation to applicable maritime regulations.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel on a coastal voyage b. Compliance with to relevant Australian and international maritime legislation, codes and conventions must be maintained: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of records include <ul style="list-style-type: none"> c.1. operational records c.2. maintenance records c.3. personnel matters c.4. safety incident reports d. Recording systems may include <ul style="list-style-type: none"> d.1. computers d.2. manual methods d.3. shipboard recording devices
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. conditions of assignment a.2. relevant statutory certification a.3. crew lists and qualifications a.4. vessel's log a.5. statutory records a.6. relevant maritime regulations
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of Australian USL Code applicable to small commercial vessels on coastal voyages a.2. International Regulations for Preventing Collisions at Sea a.3. MARPOL Convention a.4. SOLAS Convention a.5. relevant Australian and State/Territory OH&S and other legislation

Evidence Guide

APPLY REGULATIONS WHEN OPERATING A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Access and interpret information on applicable maritime regulations a.2. Apply legal requirements to vessel operation and maintenance a.3. Ensure others comply with legal requirements through training, instruction, advice and assessment a.4. Maintain survey items and prepare appropriately for surveys a.5. Monitor and control compliance of vessel operations and maintenance with applicable maritime regulations a.6. Identify problems with compliance with applicable maritime regulations and initiate appropriate remedial action a.7. Keep records of vessel's operations and maintenance activities in compliance with applicable maritime regulations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master on a small commercial vessel engaged on a coastal voyage.</p>
<p>3. Required knowledge and skills</p>	<p>a. Knowledge of applicable maritime regulations including:</p> <ul style="list-style-type: none"> a.1. sources of information on the regulations a.2. procedures for accessing the regulations a.3. interpretations of the regulations in terms of the roles and responsibilities of the master and crew of a small commercial vessel engaged on coastal voyages <p>b. Awareness and understanding of the specific regulations applicable to the operation of small vessels in relation to:</p> <ul style="list-style-type: none"> b.1. seaworthiness and unsafe vessels b.2. occupational health and safety b.3. cargo handling and security b.4. carriage of dangerous goods b.5. operational documentation b.6. safety of navigation b.7. safety manning b.8. search and rescue operations b.9. pollution of the marine environment b.10. penalties for breaches of legislative requirements <p>c. Legal certification requirements for a small vessel engaged on coastal voyages</p> <p>d. Procedures for conducting a legal survey of a vessel in accordance with the requirements of the relevant maritime authority</p> <p>e. Procedures for monitoring compliance with relevant maritime regulations</p> <p>f. Action that must be taken if non-compliance with applicable maritime regulations is identified</p> <p>g. Statutory, company and vessel requirements for the carriage of documentation</p> <p>h. Requirements for records that must be maintained and reports that must be made under applicable maritime regulations</p> <p>i. Systems and methods for recording retrieving and storing information on board a small vessel and their strengths and limitations</p> <p>j. Procedures for maintaining the security and confidentiality of information</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to demonstrate, through appropriate assignments, role plays and case studies and appropriately simulated maritime situations and case studies, the required knowledge and skills to access, interpret and apply information on regulations relevant to small commercial vessels engaged on coastal voyages.</p>

Evidence Guide (continued)

APPLY REGULATIONS WHEN OPERATING A SMALL VESSEL

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. accessing and interpreting information on applicable maritime regulations a.2. applying legal requirements to vessel operation and maintenance a.3. monitoring and controlling compliance with applicable maritime regulations a.4. keeping required records of vessel's operations and maintenance activities in compliance with applicable maritime regulations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. applicable maritime regulations b.2. OHS and fire fighting/prevention regulations and hazard prevention policies and procedures b.3. fire fighting/prevention regulations and procedures b.4. search and rescue procedures b.5. safety of life at sea procedures b.6. waste, pollution and recycling management processes c. Action taken promptly to report and/or rectify any non compliance with applicable maritime regulations d. Work is completed systematically with required attention to detail
Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2	1

TDM MF33 01A EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A SMALL VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to execute watchkeeping arrangements and behaviour on a small commercial vessel engaged on a coastal voyage that comply with the watchkeeping principles and bridgework procedures specified in the relevant regulations

The unit is consistent with relevant sections of the Australian USL Code

ELEMENT	PERFORMANCE CRITERIA
1. Carry out watchkeeping procedures	<ul style="list-style-type: none"> a. The conduct, handover and relief of the watch conforms with accepted principles and vessel's procedures b. A proper look-out is maintained at all times and in such a way as to conform to accepted principles and procedures and regulatory requirements c. The vessel is navigated safely using appropriate visual and electronic techniques to check position and to keep it on the coastal track laid down d. The progress of the vessel along a prepared coastal track is analysed and speed and course adjusted as appropriate to maintain a required estimated time of arrival at a point on the track e. Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognised f. The frequency and extent of monitoring of traffic, the vessel and the environment conform with accepted principles and procedures g. Responsibility for the safety of navigation is clearly defined at all times, including periods when the master is on the bridge and while under pilotage h. Safe navigational practice is achieved through the implementation of accepted bridge resource management principles and procedures i. IALA Buoyage System is correctly used, as required, to aid the safe navigation of a vessel engaged on a coastal voyage vessel j. Fatigue management strategies are correctly applied within the bridge management team
2. Respond to potential collision and emergency situations	<ul style="list-style-type: none"> a. Potential collision situations are analysed and appropriate action is taken in ample time and in accordance with regulatory requirements b. Correct responses are made to emergencies and situations that pose a danger to the vessel and personnel on board c. Distress signals are recognised and appropriate action is taken to initiate search and rescue procedures
3. Maintain watchkeeping records	<ul style="list-style-type: none"> a. A proper and accurate record is maintained of the movements and activities relating to the navigation of the vessel b. Appropriate entries pertaining to the watch are recorded in the vessel's log

Range Of Variables

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations b. Work is performed as a member of a bridge team within defined operational requirements and with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of nautical principles and watchkeeping techniques during the execution of watchkeeping arrangements on a vessel up to 80 metres in length engaged on a coastal voyage. c. Some discretion and judgement may be required in anticipating and dealing with possible watchkeeping problems, navigation and safety hazards and contingencies that may arise and initiating appropriate action.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 80 metres in length engaged on a coastal voyage b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Watchkeeping principles (as laid out in the relevant regulations) include: <ul style="list-style-type: none"> c.1. proper lookout must be maintained at all times c.2. duties of look out and helmsman must be kept separate c.3. look-out must give full attention to keeping a proper look out and must not be given other duties which could interfere with the task c.4. all necessary precautions must be taken to avoid pollution of the marine environment c.5. appropriate assistance must be available to be summoned to the bridge if required by a change in the vessel's situation d. Fatigue management strategies may include: <ul style="list-style-type: none"> d.1. recognition of symptoms of fatigue d.2. arranging to take a break when symptoms of fatigue are identified d.3. maintenance of personal fitness and health d.4. appropriate dietary habits d.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties e. Emergencies and potentially dangerous navigational situations may include: <ul style="list-style-type: none"> e.1. fire e.2. beaching e.3. stranding e.4. possible collision e.5. heavy weather e.6. synchronous rolling e.7. distress signal e.8. failure of bridge equipment, steering equipment, navigational lights e.9. loss of main engines e.10. man overboard e.11. fog and restricted visibility e.12. cargo shift e.13. retrieval of survivors from the water e.14. loss of watertight integrity e.15. intoxicated persons on board vessel e.16. dragging anchor e.17. fouled hawse e.18. loss of mooring lines or winches when berthing e.19. entry into confined spaces e.20. personnel working aloft or overside e.21. sudden list or loll

Range Of Variables (continued)

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A SMALL VESSEL

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>f. Available navigational aids may include:</p> <ul style="list-style-type: none"> f.1. radar f.2. electronic position-indicating devices f.3. other equipment affecting the safe navigation of the vessel <p>g. Factors to be taken into account when executing watchkeeping duties include:</p> <ul style="list-style-type: none"> g.1. bridge must never be left unattended g.2. weather and sea conditions, visibility and whether there is daylight or darkness g.3. proximity of navigational hazards g.4. use and operational condition of navigational aids g.5. the operational status of bridge instrumentation, controls and alarms g.6. provision on the bridge of unmanned machinery space (UMS) controls, alarms and indicators g.7. unusual demands on the navigational watch arising from operational conditions g.8. traffic density and other activities occurring in the area in which the vessel is navigating g.9. the size of the vessel and the field of vision available from the conning position g.10. the attention necessary when navigating in or near traffic separation schemes or other routeing measures g.11. rudder and propeller control and vessel manoeuvring characteristics
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. coastal navigation charts a.3. Australian USL as it relates to watchkeeping functions and operations on small vessels a.4. vessel's log a.5. company procedures a.6. instructions of relevant Maritime Authorities
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of Australian USL Code related to vessels up to 80 metres in length engaged on coastal voyages a.2. regulations for preventing collisions at sea a.3. relevant Australian and State/Territory OH&S legislation

Evidence Guide

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement watch keeping arrangements and procedures on a vessel up to 80 metres in length engaged on a coastal voyage a.2. Fulfil watchkeeping responsibilities and apply watchkeeping principles a.3. Take appropriate action in the event of a potential collision or other emergency situation arising during a watch a.4. Communicate effectively with others in the course of watchkeeping duties
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master of a vessel up to 80 metres in length engaged on a coastal voyage.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant maritime regulations b. Relevant OH&S legislation and policies c. Procedures for the use of the IALA Buoyage System d. Implications of a range of factors that can affect watchkeeping functions on a vessel up to 80 metres in length engaged on a coastal voyage e. Causes of groundings, collisions and casualties when on board vessel f. Typical navigational hazards and implications for watchkeeping on a vessel up to 80 metres in length engaged on a coastal voyage g. Operating procedures for typical navigational aids and skills and knowledge needed to use them effectively h. Watch handover procedures i. Watchkeeping problems and emergency situations for commercial vessels up to 80 metres in length engaged on a coastal voyages and appropriate action and solutions j. Manual and electronic navigational aids available to the bridge team and the procedures for their operation and use during a watch k. Instrumentation, controls and alarms on a vessel up to 80 metres in length engaged on a coastal voyage l. Rudder and propeller control and vessel manoeuvring characteristics m. Precautions necessary when navigating in or near traffic separation schemes or other routing measures n. Fatigue management principles and techniques including <ul style="list-style-type: none"> n.1. signs of fatigue n.2. ways of controlling fatigue n.3. action to be taken when fatigued o. Maritime communication techniques require during watchkeeping functions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate the ability to maintain a safe watch through a range of suitably-simulated watchkeeping situations, exercises and case studies and/or b. maintain a safe watch on a commercial vessel up to 80 metres in length engaged on a coastal voyage over an appropriate range of situations and weather and sea conditions

Evidence Guide (continued)

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A SMALL VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 executing watchkeeping arrangements on a vessel up to 80 metres in length engaged on a coastal voyage a.2 identifying and evaluating watchkeeping problems and determining an appropriate courses of action a.3 identifying and implementing improvements to bridge management procedures a.4 applying safety precautions relevant to watchkeeping operations a.5 dealing with potential collisions and other potentially dangerous situations arising during a watch <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant guidelines relating to bridge management and watchkeeping arrangements on board vessel b.5 following bridge housekeeping processes <p>c. Action taken promptly to report and/or rectify watchkeeping incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3	2	2

TDM MF35 01A CONtribute to Maintaining a Safe Watch

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required by an integrated rating to contribute to a safe navigational watch on a commercial vessel under the direction of the Officer of the Watch and in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of the vessel and the persons on board.

The unit is consistent with the related functional standard in Section A II/4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4

ELEMENT	PERFORMANCE CRITERIA
1. Contribute to watchkeeping procedures	<ul style="list-style-type: none">a. Effective communication with the officer of the watch is correctly maintained at all times on matters relevant to the role of an integrated rating during watchkeeping dutiesb. Bridge communications are clear and concise and advice or clarification is sought from the officer on watch when watch information or instructions are not clearly understoodc. A proper look-out is maintained at all times and in such a way as to conform to accepted principles and procedures and regulatory requirementsd. Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognisede. The frequency and extent of monitoring of traffic, the vessel and the environment conform with established principles and proceduresf. Internal and external communications systems are used in accordance with bridge procedures and manufacturer's instructionsg. Precautions and procedures are followed to implement environmental protection measuresh. Fatigue management strategies are correctly applied within the bridge management team
2. Respond to potential emergency situations	<ul style="list-style-type: none">a. Observations and emergency situations are promptly reported to the officer on watch in accordance with bridge proceduresb. Distress signals are recognised and reported in accordance with bridge procedures

Range Of Variables

CONTRIBUTE TO MAINTAINING A SAFE WATCH

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW 95 Code and Convention. b. Work is performed under the direction of the Officer of the Watch as a member of a bridge team in accordance with defined operational requirements, with some accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of look out and observational techniques across a variety of operational contexts. Following of orders and instructions of the officer on watch is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Watchkeeping principles for a rating (as laid out in the AMSA Marine Orders) include: <ul style="list-style-type: none"> c.1. proper lookout must be maintained at all times c.2. duties of look out and helmsman must be kept separate c.3. look-out must give full attention to keeping a proper look out and must not carry out other duties which could interfere with the task c.4. all necessary precautions must be taken to avoid pollution of the marine environment c.5. appropriate assistance must be available to be summoned to the bridge if required by a change in the vessel's situation d. Fatigue management strategies may include: <ul style="list-style-type: none"> d.1. recognition of symptoms of fatigue d.2. arranging to take a break when symptoms of fatigue are identified d.3. maintenance of personal fitness and health d.4. appropriate dietary habits d.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties e. Emergencies may include: <ul style="list-style-type: none"> e.1. fire e.2. stranding e.3. possible collision e.4. heavy weather e.5. synchronous rolling e.6. distress signal e.7. failure of bridge equipment, steering equipment, navigational lights e.8. loss of main engines e.9. man overboard e.10. fog and restricted visibility e.11. cargo shift e.12. ice formation on hull and superstructure e.13. floating ice e.14. retrieval of survivors from the water e.15. loss of watertight integrity e.16. intoxicated persons on board a vessel e.17. dragging anchor e.18. fouled hawse e.19. loss of mooring lines or winches when berthing e.20. entry into confined spaces e.21. personnel working aloft or overside e.22. sudden list or loll

Range Of Variables (continued)

CONTRIBUTE TO MAINTAINING A SAFE WATCH

VARIABLE	SCOPE
3. Sources of information / documents	a. Documentation / records may include a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. orders and instructions of the officer on watch a.3. procedures for reporting emergencies and observations to the Officer in charge of the Watch a.4. instructions of relevant Maritime Authorities a.5. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. relevant sections of IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. ISM Code a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

CONTRIBUTE TO MAINTAINING A SAFE WATCH

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Contributing to watch keeping arrangements and procedures a.2. Fulfill responsibilities of an integrated rating during a watch a.3. Reporting observations and other emergency situations arising during a watch a.4. Communicate effectively with others in the course of watchkeeping duties
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.
3. Required knowledge and skills	a. Relevant OH&S legislation, codes of practice, policies and procedures b. Bridge procedures on board a vessel c. Functions and responsibilities of the members of a bridge team onboard a vessel d. Procedures for the relief, maintenance and handover of a watch e. Procedures for the use of internal communications and alarm systems f. Factors that can affect watchkeeping functions g. Causes of groundings, collisions and casualties when on board a vessel h. Navigational hazards and implications for watchkeeping i. Typical watchkeeping problems and emergency situations and appropriate action and solutions j. Bridge instrumentation, controls and alarms relevant to the functions of an integrated rating k. Functions of unmanned machinery space (UMS) controls, alarms and indicators l. Rudder and propeller control and vessel manoeuvring characteristics m. Signs of fatigue n. Fatigue management principles and techniques o. Basic environmental protection measures p. Maritime communication techniques used within a bridge team onboard a vessel
4. Resource implications	Access is required to opportunities to either: a. demonstrate the ability to contribute to a safe watch in range of suitably-simulated of watchkeeping situations relevant to the role of an integrated rating; and/or b. contribute to maintaining a safe watch as an integrated rating on a commercial vessel in an appropriate range of situations and weather and sea conditions

Evidence Guide (continued)

CONTRIBUTE TO MAINTAINING A SAFE WATCH

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out look out duties a.2 identifying watchkeeping problems and reporting them to the officer in charge of the watch a.3 applying safety precautions relevant to the role of an integrated rating during watchkeeping operations a.4 reporting observations and other potentially dangerous situations to officer in charge of the watch a.5 communicating effectively with the officer in charge of the watch in matters relevant to watchkeeping duties <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 ISM Code and associated ship's Safety Management System and procedures b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant guidelines relating to the role of an integrated rating on board a vessel b.5 following bridge housekeeping processes <p>c. Action taken promptly to report watchkeeping incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDM MF37 01A MANAGE VESSEL OPERATIONS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to manage the operations and resources of a vessel, including fulfilling legal responsibilities, the implementation of the International Safety Management (ISM) Code, development and implementation of the vessel's ISM and safety management system, following of procedures to obtain a Safety Management Certificate and undergoing subsequent audits, the planning, implementation and monitoring of OHS procedures and practices onboard a vessel, monitoring and controlling expenditure related to the vessel's budget, analysing and compiling voyage data, and preparing related reports, investigating, analysing and compiling casualty data and preparing related reports.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Develop plans for general and specific vessel operations</p>	<ul style="list-style-type: none"> a. Goals and objectives of vessel operations are identified in accordance with company procedures operational orders, regulatory requirements and established marine management practice b. Plans for general and specific vessel operations are drawn up c. Correct procedures for emergency response onboard a vessel are developed in accordance with company procedures operational orders, regulatory requirements and established marine management practice d. Appropriate validation measures and standards are devised to monitor progress in operations against the plans e. Appropriate contingency plans are developed for any discrepancies or variations that may occur in the course of operations f. Opportunities for improvement to services procedures and systems are identified and appropriate measures are taken to act on these opportunities in accordance with company procedures and established marine management practice g. Plans, goals, objectives and instructions for general and specific vessel operations and emergency and contingency procedures are distributed to relevant personnel in accordance with company procedures and established marine management practice
<p>2. Ensure legal requirements are fulfilled</p>	<ul style="list-style-type: none"> a. Legal obligations under the Articles of Agreement are fulfilled b. Laws and regulations pertaining to vessel operations and contingencies are implemented c. Entries are made into the vessel's Official Log Book as required d. Appropriate arrangements are made for the preparation of a vessel for statutory survey and certification e. The relevant Code of Conduct and industrial agreements are applied to vessel operations and management
<p>3. Monitor and control vessel expenditure</p>	<ul style="list-style-type: none"> a. Accrual accounting procedures are correctly used to monitor and control vessel expenditure b. Where relevant, the vessel's budget is prepared in accordance with established vessel's financial procedures and established accounting practice c. Plans and appropriate contingency procedures are developed to correct any variation from the vessel's budget d. Vessel expenditure is recorded in accordance with established vessel's financial procedures and established accounting practice e. Vessel expenditure is compared against the vessel's budget at established times in accordance with established vessel's financial procedures and established accounting practice and any variation from the planned budget identified f. Appropriate action is taken in the event of variation expenditure from the vessel's budget in accordance with contingency plans, company procedures and established accounting practice

<p>4. Develop and implement the vessel's ISM Code Safety Management System</p>	<ul style="list-style-type: none"> a. A Safety Management System (SMS) for the vessel is developed in accordance with the requirements of the International Safety Management (ISM) Code and company procedures b. Safety procedures and related documentation required in an ISM Code Safety Management System are developed in collaboration with relevant vessel personnel c. The structure and content of the vessel's ISM documentation meets the requirements of the ISM Code d. SMS manuals and related documentation meeting ISM Code requirements are reproduced and disseminated to relevant personnel onboard a vessel e. Appropriate measures are taken to ensure all personnel onboard a vessel are familiar with SMS documentation and apply SMS procedures relevant to their functions f. Appropriate arrangements are made for new personnel to be instructed in their role and responsibilities under the vessel's ISM Code Safety Management System g. Correct procedures are followed to obtain a Safety Management Certificate under the ISM Code in accordance with international and national regulatory requirements h. Compliance with the requirements of the ISM Code Safety Management System is monitored, verified, reviewed and evaluated in accordance with company procedures and appropriate action taken in situations where SMS requirements are not being met i. Correct procedures are followed for both internal and external auditing, verification and control of the vessel's SMS to maintain certification under the ISM Code in accordance with international and national regulatory requirements j. Safety incidents and casualties onboard a vessel are investigated, analysed and reported in accordance with the vessel's ISM Code, company procedures and OHS regulatory requirements
<p>5. Monitor and control vessel's physical resources</p>	<ul style="list-style-type: none"> a. The vessel's inventory of plant, equipment and other physical resources is maintained in accordance with company procedures, vessel's survey requirements and established marine management practice b. Reports of faulty, worn or damaged plant, equipment and resources are acted upon for repair or replacement in accordance with company procedures, vessel's survey and regulatory requirements and established marine management practice c. Reports are prepared on the status of the vessel's physical resources and are submitted to relevant personnel within the company and regulatory authorities in accordance with company procedures, vessel's survey requirements and established marine management practice
<p>6. Analyse and compile voyage data</p>	<ul style="list-style-type: none"> a. Voyage data is collected and compiled in accordance with company practice, regulatory requirements and established marine management practice b. A voyage report is prepared and validated in accordance with company procedures, vessel's survey requirements and established marine management practice c. Voyage report is submitted to designated personnel in accordance with company procedures, vessel's survey requirements and established marine management practice

Range Of Variables

MANAGE VESSEL OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensure that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental operational, financial, resource and safety management principles across a wide and often unpredictable variety of operational contexts. Contribution to the development and implementation of a broad operations and resources management plan and an ISM Code Safety Management System consistent with regulatory requirements and the operational needs of the vessel is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, management and leadership functions related to operational, financial, resource and safety management. This includes management and control of personnel, finances and physical resources, analysis of situations and related decision making.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more (in the case of Masters) and unlimited propulsion power (in the case of Engineers) b. Shipboard administration and management may include: <ul style="list-style-type: none"> b.1. developing and monitoring plans for general and specific operations onboard the vessel b.2. establishing and monitoring performance standards for vessel operations b.3. developing and monitoring the implementation of the vessel's ISM Code Safety Management System b.4. investigating and reporting upon safety incidents and emergencies b.5. developing and implementing vessel's emergency procedures and contingency plans b.6. developing and implementing procedures for the monitoring and control of expenditure b.7. developing and implementing procedures for the monitoring and control of plant, equipment and physical resources b.8. collecting and compiling voyage data and preparing voyage reports c. Vessel's operations may include: <ul style="list-style-type: none"> c.1. navigation c.2. cargo handling and care c.3. berthing and de-berthing c.4. mooring operations c.5. slipping operations c.6. engine room operations and maintenance c.7. bridge operations c.8. radio operations c.9. personnel training c.10. safety / emergency drills c.11. deck operations and maintenance c.12. emergency and damage control operations c.13. pollution control operations c.14. catering operations c.15. passenger service operations d. Laws and regulations pertaining to vessel's operations and contingencies may relate to: <ul style="list-style-type: none"> d.1. safety (Australian regulations and IMO conventions) d.2. marine pollution (Australian laws and IMO conventions) d.3. immigration d.4. quarantine d.5. salvage and towage d.6. stowaways d.7. refugees d.8. wrecks d.9. deaths and disappearances d.10. agency d.11. drugs d.12. smuggling d.13. piracy

Range Of Variables (continued)

MANAGE VESSEL OPERATIONS

VARIABLE	SCOPE
2. Worksite environment (continued)	<p>e. Legal issues relevant to a Master's or Chief Engineer's responsibility may include:</p> <ul style="list-style-type: none"> e.1. functions and responsibilities of the shipowner and charterer in various types of charters e.2. shipowner's obligation of reasonable dispatch e.3. lay time, demurrage and dispatch e.4. functions of a Bill of Lading e.5. characteristics of a Contract of Carriage e.6. international conventions relating to liability of a sea carrier e.7. salvage and towage contracts e.8. tort liability e.9. legal principles of pilotage e.10. Admiralty Jurisdiction e.11. insurance arrangements e.12. vessel registration requirements e.13. investigations and Courts of Marine Inquiry <p>f. Vessel's physical resources may include:</p> <ul style="list-style-type: none"> f.1. engine room propulsion plant and equipment and related auxiliary systems f.2. tools and maintenance equipment f.3. vessel's structures and fittings f.4. bridge equipment and resources f.5. vessel's deck equipment, fittings and related systems f.6. navigation charts, marine publications, manufacturer's manuals and other reference documentation f.7. radio equipment and facilities f.8. catering equipment and facilities f.9. accommodation equipment and facilities
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. ISM Code a.3. OHS regulations and procedures a.4. IMO STCW 95 Convention and Code a.5. AMSA Marine Orders a.6. company's management procedures a.7. vessel's general and specific operational and contingency plans a.8. vessel's emergency procedures a.9. vessel's plant and equipment inventory a.10. vessel's survey requirements a.11. vessel's log a.12. vessel's accrual accounting and financial procedures a.13. vessel's budget a.14. voyage reporting procedures a.15. safety and emergency incident reporting requirements a.16. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to the management of vessels of 500 gross tonnage or more a.2. ISM Code a.3. SOLAS Convention a.4. MARPOL Convention a.5. relevant sections of AMSA Marine Orders a.6. relevant international, Australian and State/Territory OH&S and pollution control legislation a.7. Australian OHS and pollution control legislation and related policies a.8. relevant International and national financial, safety and operational management standards

Evidence Guide

MANAGE VESSEL OPERATIONS

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Develop and implement plans for general and specific vessel operations a.2. Develop and implement the vessel's ISM Code Safety Management System a.3. Monitor and control vessel expenditure a.4. Monitor and control vessel's physical resources a.5. Analyse and compile voyage data a.6. Identify typical human resource management problems and take appropriate action a.7. Communicate effectively with others as part of human resource management
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other shipboard operations and resource management units that form part of a job role of the master or chief engineer (i.e. units ML1 <i>Organise and manage the crew</i> and MF3 <i>Monitor compliance with legislative requirements and measures to ensure safety of life at sea</i>).
3. Required knowledge and skills	a. Knowledge of relevant sections of IMO Conventions and Codes and AMSA Marine Orders b. Knowledge and understanding of laws and regulations pertaining to vessel's operations and contingencies c. General principles of integrated vessel and bridge management d. Typical procedures for planning, implementing and monitoring goals and performance requirements for vessel operations and emergencies e. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures f. Principles and content of the International Safety Management (ISM) Code g. The aims, objectives, advantages and disadvantages of the ISM Code and associated vessel's Safety Management System h. The relationship of the ISM Code with other IMO Conventions and Codes i. General provisions for the development and monitoring of a vessel's Safety Management System j. The typical structure of a vessel's ISM Code SMS documentation, including various forms of SMS manuals k. Procedures for obtaining a Safety Management Certificate and undergoing subsequent audits to maintain it l. Procedures for the collection, compiling, analysing and reporting on safety incidents and casualties onboard a vessel including the format and characteristics of a good safety incident report m. Established marine resource management procedures and practice n. Vessel's survey requirements o. Methods of identifying problems in services to other departments or in procedures and systems p. Techniques for evaluating and seeking alternatives for improvement of shipboard operational and emergency procedures and systems q. Procedures for compiling and preparing a voyage report including typical contents and formats r. Established financial management and accrual accounting procedures and practice, including a basic understanding of factors that assist in predictive monitoring of vessel's expenditure s. Maritime communication techniques including barriers to effective communication and how to overcome them t. Typical shipboard operational, safety, financial, resource management problems and appropriate action and solutions u. Procedures for action in the event of identified non-compliance with ISM Code Safety Management systems, OHS and pollution control regulations, vessel's survey requirements and other company and regulatory requirements v. Procedures for the recording of operational, safety, financial, maintenance, emergency and other management –related information and data

Evidence Guide (continued)

MANAGE VESSEL OPERATIONS

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably simulated operational, safety, financial, emergency and contingency management activities covering a range of situations that are typically experienced on a commercial vessel: and/or b. contribute to operational, safety, financial, emergency and contingency management activities on a commercial vessel of appropriate size in an appropriate range of operational situations
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. developing and implementing plans for general and specific vessel operations a.2. developing and implementing the vessel's ISM Code safety management system a.3. monitoring and controlling vessel expenditure a.4. monitoring and controlling vessel's physical resources a.5. analysing and compiling voyage data and producing related reports a.6. identifying typical management problems and taking appropriate action a.7. communicating effectively with others as part of management functions b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2. ISM Code and associated vessel's Safety Management System and procedures b.3. OHS and pollution control regulations policies and procedures b.4. job procedures and work instructions b.5. ISM Code safety management system procedures b.6. relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.7. vessel's accrual accounting procedures c. Action taken promptly to report and/or rectify management problems in accordance with established maritime management practice d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MF43 01A CARRY OUT FAST RESCUE CRAFT (FRC) OPERATIONS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to carry out fast rescue craft operations, including maintenance of the fast rescue craft, preparation of fast rescue craft and crew for operations, taking charge of a fast rescue craft during and after launch, responding to craft, equipment and crew emergencies or malfunctions, locating and retrieving casualties, and recovering and securing the fast rescue craft after operations.

The unit is consistent with the related functional standard in Section A VII/2of the STCW 95 Code.

ELEMENT	PERFORMANCE CRITERIA
1. Maintain the fast rescue craft for operations	a. The fast rescue craft and items of equipment are maintained in accordance with manufacturers specifications and operational requirements.
2. Prepare fast rescue craft and crew for operations	a. Pre-launch checks are conducted in accordance with manufacturers specifications and operational requirements. b. Appropriate specialised emergency equipment is stowed on board the fast rescue craft. c. Operational responsibilities and lines of communication are confirmed with relevant personnel. d. Appropriate personal protective and foul weather equipment is worn by all fast rescue craft crew e. The readiness of the fast rescue craft, crew and equipment for launch is confirmed with relevant personnel.
3. Take charge of a fast rescue craft during and after launch	a. The fast rescue craft is launched in a controlled and safe manner in accordance with craft and launch systems manufacturers specifications, and instructions. b. Hook release system is operated according to manufacturers specifications, and the launch vessel and launch equipment are cleared safely c. Engine power is managed within manufacturers torque range in a manner which ensures smooth and efficient movement and d. Minimises damage to the engine and accessories. e. The fast rescue craft is operated within the safe operational limits of the craft for the prevailing conditions. f. All manoeuvres are performed with due regard to drive system manoeuvring characteristics. g. All manoeuvres are performed so as to ensure the safety of personnel on board and in the water. h. Navigational equipment is used in accordance with manufacturers specifications. i. Communication and signalling equipment is used in accordance with manufacturers specifications and operational requirements. j. Lines of communications are established and maintained between the craft, other vessels, rig and helicopters as appropriate. k. Emergency equipment is used in accordance with manufacturers specifications, supervisor's instructions and emergency conditions.

<p>4. Respond to craft, equipment and crew emergencies or malfunctions</p>	<ul style="list-style-type: none"> a. The capsized fast rescue craft is righted using the craft righting system, with due regard to crew safety and possible damage to craft and equipment. b. Swimming is performed in standard personal protective equipment, foul weather clothing or other specialised protective equipment as appropriate. c. Appropriate procedures for reboarding the fast rescue craft, wearing operational clothing and equipment, are applied. d. Emergency repairs and maintenance to fast rescue craft and equipment is performed in accordance with manufacturers specifications and emergency conditions.
<p>5. Locate and retrieve casualties</p>	<ul style="list-style-type: none"> a. Appropriate search patterns are followed in accordance with instructions from search coordinator. b. Search patterns and rescue procedures are coordinated with other fast rescue craft where appropriate. c. Casualties are approached in a manner that ensures the safety of the casualty and boat crew. d. The fast rescue craft is positioned so as to ensure safe and quick retrieval of casualties. e. The condition of the casualty is determined and appropriate recovery procedures are implemented. f. Appropriate lifting procedures are adopted to ensure the safe retrieval of the casualty. g. Emergency first aid procedures are applied as appropriate. h. Master or medical officer are notified of the casualties condition and medical instructions are followed as appropriate. i. The casualty is transferred to the vessel, rig, helicopter or other place of safety with due regard to the types of injuries sustained.
<p>6. Recover the fast rescue craft</p>	<ul style="list-style-type: none"> a. Stand down procedures are followed b. The fast rescue craft is recovered in a controlled and safe manner in accordance with craft, hook release systems and recovery systems manufacturers specifications, and instructions. c. The fast rescue craft and equipment are secured on board and prepared for future operations.

Range Of Variables

CARRY OUT FAST RESCUE CRAFT (FRC) OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and relevant IMO Conventions including the STCW 95 Code and Convention. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of established maritime survival principles and practices to the launching and operation of fast rescue craft and the use of related survival equipment. Implementation of established survival strategies and procedures is involved. Limited accountability and responsibility for self and others in achieving the outcomes is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel launching or recovering the FRC may include any Australian or international vessel b. Launching and operation of fast rescue craft and related equipment may take place: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. while hove to b.5. while anchored or moored b.6. in appropriately simulated situations c. Hull construction for FRC includes but is not be restricted to: <ul style="list-style-type: none"> c.1. rigid hulls c.2. semi-rigid hulls c.3. inflatable hulls d. Hull flotation systems may include but not be restricted to: <ul style="list-style-type: none"> d.1. sealed floor d.2. foam filled collar d.3. inflatable collar d.4. inflatable pontoons e. Drive and manoeuvring systems may include but not be restricted to: <ul style="list-style-type: none"> e.1. inboard/outboard e.2. outboard e.3. jet drives e.4. single propeller e.5. twin propeller e.6. jet e.7. rudder f. Re-righting systems may include but not be restricted to: <ul style="list-style-type: none"> f.1. inflatable bag supported by the stern mounted roll bar which is accessible from outside the craft f.2. rope mounted on the outside of the craft g. Launch and recovery systems may include but not be restricted to: <ul style="list-style-type: none"> g.1. deck crane or davit g.2. rig crane g.3. four point sling with fixed eye g.4. solid mounted frame using fixed hook assembly h. Personal protective equipment and foul weather gear may include but not be restricted to: <ul style="list-style-type: none"> h.1. inflatable life jacket h.2. protective footwear h.3. overalls h.4. safety helmet and gloves h.5. eye protection h.6. sun screen h.7. wet weather gear h.8. thermal suits (if appropriate)

Range Of Variables (continued)

CARRY OUT FAST RESCUE CRAFT (FRC) OPERATIONS

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>i. Items of equipment may include but not be restricted to:</p> <ul style="list-style-type: none"> i.1. ladles i.2. buoyant bailer i.3. compass i.4. sea anchor i.5. 15 meter painter i.6. 50 meter buoyant towing line i.7. waterproof electric torch i.8. whistle i.9. first aid kit i.10. rescue buoyant quoits with 30 meter line i.11. waterproof search light i.12. tool kit i.13. specialised emergency equipment i.14. radar reflector i.15. thermal protective blankets i.16. safety buoyant clasp knife i.17. buoyant safety line i.18. sponges i.19. foot pump i.20. fire extinguisher i.21. repair kit i.22. safety boat hook i.23. flair pack containing hand-held orange smoke flairs, hand-held red flairs & hand held rocket flairs i.24. prevailing conditions may include but not be restricted to: i.25. broken or rough water i.26. cross-winds, swell and/or tide i.27. wind, swell and/or tide running with the craft i.28. wind, swell and/or tide running against the craft i.29. night or day <p>j. Pre-launch or ongoing craft and equipment checks should include but may not be restricted to:</p> <ul style="list-style-type: none"> j.1. hull integrity j.2. launch capability is not obstructed j.3. crane is operable j.4. bousing lines are operable j.5. personal protective equipment is available and operable j.6. ancillary equipment is on board j.7. battery j.8. communications equipment j.9. compass j.10. search light j.11. fuel lines & pumps j.12. specialised emergency equipment j.13. tow rope j.14. steering j.15. drive units including oil levels, clearance from obstruction, tilt levels, nozzle operation where applicable j.16. engine levels including oil, water and v-belts j.17. engine is operable j.18. lines of communication j.19. operational procedures and requirements j.20. lifting sling or hook j.21. electrical equipment j.22. switches

Range Of Variables (continued)

CARRY OUT FAST RESCUE CRAFT (FRC) OPERATIONS

<p>2. Worksite environment (continued)</p>	<p>k. Fast Rescue Craft manoeuvres include but are not restricted to:</p> <ul style="list-style-type: none"> k.1. turning through 180 degrees in a narrow channel requiring forward and reverse movement k.2. coming alongside or leaving a pontoon, jetty or other fixed object k.3. coming alongside and leaving a moving vessel k.4. pacing a vessel or helicopter k.5. following search patterns k.6. approaching a casualty in the water k.7. positioning the craft for casualty pick-up k.8. transferring personnel or equipment to or from stationary or moving point k.9. towing or being towed by other craft k.10. high speed approaches <p>l. Search patterns may include but not be restricted to:</p> <ul style="list-style-type: none"> l.1. sector search l.2. parallel track search using 1,2 or 3 craft l.3. ship/aircraft coordinated pattern <p>m. Emergency First Aid Care may include but not restricted to:</p> <ul style="list-style-type: none"> m.1. cardio-pulmonary resuscitation m.2. expired air resuscitation m.3. control of internal or external bleeding m.4. monitoring of vital signs m.5. care of burns m.6. control of shock m.7. control of hypothermia m.8. determination of the extent of head and spine injury and appropriate care m.9. care of breaks and fractures m.10. care following the ingestion of fuel <p>n. Fast rescue craft emergencies may include but not be restricted to:</p> <ul style="list-style-type: none"> n.1. collision n.2. capsize n.3. electrical or mechanical failure n.4. crew or equipment overboard n.5. injury to crew n.6. leaks or flooding
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.1. IMO STCW 95 Code and Convention a.2. AMSA Marine Orders a.3. SOLAS regulations a.4. AMSA publication 'Survival at Sea – a Training and Instruction Manual' a.5. vessel's log a.6. instructions from official search and rescue authorities a.7. vessel's procedures for emergency response including abandoning vessel a.8. manufacturer's instructions for the use of survival craft and equipment a.9. instructions of relevant Maritime Authorities related to survival at sea a.10. relevant OH&S legislation, codes of practice, policies and procedures a.11. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention dealing with survival at sea and use of survival craft and equipment a.2. relevant sections of AMSA Marine Orders dealing with survival at sea and use of survival craft and equipment a.3. Safety of Life at Sea (SOLAS) regulations a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

CARRY OUT FAST RESCUE CRAFT (FRC) OPERATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Maintain the fast rescue craft and its equipment for operations a.2. Identify and use appropriate craft and emergency equipment a.3. Prepare fast rescue craft and crew for operations a.4. Complete the fast rescue craft launch ensuring crew safety a.5. Manoeuvre the fast rescue craft in prevailing sea and weather conditions according to operational requirements a.6. Operate engine, navigation, steering, communication and other auxiliary equipment in accordance with manufacturers specifications and operational requirements a.7. Respond to and rectify in-boat emergencies a.8. Follow appropriate search patterns a.9. Approach the casualty and determine the extent of the injuries a.10. Operate casualty recover equipment a.11. Recover the casualty using recovery procedures appropriate to the injuries sustained. a.12. Apply appropriate emergency first aid procedures a.13. Transfer the casualty to a place of safety using procedures appropriate to the injuries sustained a.14. Recover and secure the fast rescue craft and its equipment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other competency units that form part of a job role of an Officer on a vessel</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of IMO STCW 95 Code and AMSA Marine Orders b. ISM Code safety management system plans, procedures, checklists and instructions c. Relevant OH&S legislation, codes of practice, policies and procedures d. SOLAS regulations e. Types of fast rescue craft and relevant ancillary equipment, including: <ul style="list-style-type: none"> e.1. construction, e.2. features e.3. starting and operating characteristics e.4. outfitting of FRCs, such as: <ul style="list-style-type: none"> e.4.1. auxiliary equipment e.4.2. specialised emergency equipment e.4.3. communications equipment f. Manoeuvring and engine characteristics for fast rescue craft, including handling strategies to overcome hazards caused by a head sea, a following sea and a beam sea g. Effects of sea and weather conditions on fast rescue craft operations h. Equipment maintenance and emergency repair procedures i. Signals and communications protocols j. Launch and recovery equipment, procedures and safety precautions k. Search patterns and environmental factors affecting their execution l. Procedures and sequences of action for correctly operating and using fast rescue craft, including: <ul style="list-style-type: none"> l.1. launching fast rescue craft and carrying out pre-start engine checks l.2. operating fast rescue craft in prevailing sea and weather conditions l.3. using specialised emergency equipment l.4. correctly using signals and communications equipment l.5. maintenance and emergency repair of craft and auxiliary equipment l.6. using launch and recovery equipment l.7. using fast rescue craft righting systems and procedures l.8. undertaking appropriate search patterns l.9. performing appropriate casualty recovery procedures l.10. performing appropriate emergency first aid procedures m. Symptoms of hypothermia, its prevention and treatment and the related use of protective covers and garments such as immersion suits and thermal protective aids n. IMO safety symbols o. Ability to swim in personal protective equipment, foul weather gear or specialised protective equipment p. Mandatory knowledge and skills in personal survival techniques required of all seafarers, as per Section A VI/1 of the IMO STCW 95 Code

Evidence Guide (continued)

CARRY OUT FAST RESCUE CRAFT (FRC) OPERATIONS

3. Resource implications	<p>a. Access is required to opportunities to either:</p> <p>a.1. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to launch and operate fast rescue craft and related equipment, and/or</p> <p>a.2. launch and operate fast rescue craft and related equipment during emergency response simulations and drills on board an operational commercial or training vessel</p>
4. Consistency in performance	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1. maintaining the fast rescue craft for operations</p> <p>a.2. preparing a fast rescue craft and crew for operations</p> <p>a.3. taking charge of a fast rescue craft during and after launch</p> <p>a.4. responding to craft, equipment and crew emergencies or malfunctions</p> <p>a.5. locating and retrieving casualties</p> <p>a.6. recovering the fast rescue craft</p> <p>a.7. assessing operational capability of a fast rescue craft</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1. relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders</p> <p>b.2. ISM Code and associated ship's Safety Management System and procedures</p> <p>b.3. OHS regulations and hazard prevention policies and procedures</p> <p>b.4. accepted survival procedures and maritime survival practice</p> <p>b.5. relevant manufacturer's guidelines relating to the operation and use of fast rescue craft and equipment, including instructions on equipment capability and limitations</p> <p>c. Action taken promptly to report and/or rectify problems in the launching and operation of fast rescue craft and equipment in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
5. Context for assessment	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	3	3	1	2	2

TDM MF44 01A APPLY SAFETY REGULATIONS ON ROLL-ON ROLL-OFF PASSENGER VESSELS

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to ensure the application of safety regulations on roll-on roll-off passenger and vehicular vessels, including assisting passengers in emergency situations, organising and implementing mustering procedures, assisting passengers en route to embarkation and mustering stations, ensuring the correct operation and maintenance of equipment peculiar to roll-on roll-off vessels, and ensuring compliance with safety regulations peculiar to roll-on roll-off vessels.

The unit is consistent with the related functional standard in Section A V/1 of the STCW 95 Code and AMSA Marine Orders – Part 3, Issue 5, Appendix 5.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Assist passengers in emergency situations</p>	<ul style="list-style-type: none"> a. Established life saving appliance and control plans are correctly implemented b. Guidance is correctly provided to passengers during emergencies with due regard to any potential language difficulties due to the nationalities and languages of the crew and passengers c. Details of muster lists and emergency instructions are provided to passengers and crew in accordance with established procedures d. Passengers are made aware of emergency exits and restrictions on the use of elevators during an emergency e. Appropriate languages are used to broadcast announcements during an emergency to convey critical guidance to passengers and to facilitate crew members in assisting passengers
<p>2. Organise and implement mustering procedures</p>	<ul style="list-style-type: none"> a. Mustering of passengers is organised in accordance with established procedures b. Appropriate action is taken to keep order amongst passengers during an emergency c. Established procedures are used to reduce and avoid panic amongst passengers and crew during an emergency d. Passenger lists are correctly used for evacuation counts where appropriate e. Checks are made to ensure that the passengers are appropriately clothed for the type of emergency situation and have correctly donned their lifejackets
<p>3. Assist passengers en route to embarkation and mustering stations</p>	<ul style="list-style-type: none"> a. Passengers are assisted en route to embarkation and mustering points in accordance with established procedures b. Clear reassuring orders are given to passengers and crew to guide them during emergency situations c. Passenger movements are correctly controlled in corridors, staircases and passageways d. Checks are made to ensure that escape routes are maintained clear of obstructions e. Appropriate evacuation methods are made available to disabled persons and persons needing special assistance f. Accommodation spaces are correctly searched during an emergency in accordance with established procedures

<p>4. Ensure the operation and maintenance of equipment peculiar to roll-on roll-off vessels</p>	<ul style="list-style-type: none"> a. Emergency equipment on a roll-on roll-off vessel is checked to ensure that it is functional, calibrated where required, and is ready for use b. Emergency equipment is correctly selected and used during emergency situations c. Appropriate action is taken to ensure the correct operation and maintenance of the vessel's bow, stern and side doors and ramps, scuppers and associated systems
<p>5. Ensure compliance with safety regulations peculiar to roll-on roll-off vessels</p>	<ul style="list-style-type: none"> a. Appropriate account is taken of stability and stress requirements and limitation of roll-on roll-off vessels in accordance with the relevant maritime regulations b. Appropriate action is taken to ensure vessel personnel have had appropriate safety training to provide direct service to passengers in passenger spaces during an emergency c. Appropriate action is taken to prevent or reduce the ingress of water during an emergency in accordance with established procedures and regulatory requirements d. Established procedures are correctly used remove water from vehicle decks and to minimise its effects e. Proper observance is maintained of special precautions and limitations applying to designated dangerous cargo areas f. Appropriate action is taken to avoid pollution in accordance with the relevant maritime regulations and established procedures g. Vehicles, rail cars and other cargo transport units are secured in accordance with the 'Code of Practice for Cargo Stowage and Securing' and established procedures h. Atmosphere in roll-on roll-off cargo spaces is monitored and controlled (where relevant) in accordance with regulatory requirements and established procedures i. Established procedures are followed to ensure adequate ventilation of roll-on roll-off cargo spaces during a voyage, when loading and discharging vehicles, and during emergencies

Range Of Variables

APPLY SAFETY REGULATIONS ON ROLL-ON ROLL-OFF PASSENGER VESSELS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW 95 Code and Convention, ISM Code, roll-on roll-off vessel safety guides and port regulations related to roll-on roll-off vessel operations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of operational and supervisory principles and procedures and hazard minimisation strategies to ensure the application of safety regulations on a roll-on roll-off passenger and vehicular transport vessel. Work requires significant judgement in planning, technical and leadership functions related to operations and maintenance on a roll-on roll-off vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international roll-on roll-off passenger and vehicular transport vessel b. Operations and maintenance on a roll-on roll-off vessel may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while loading and unloading b.4. while underway b.5. during berthing and unberthing operations b.6. while anchoring or mooring c. Types of cargo may include: <ul style="list-style-type: none"> c.1. road vehicles including cars trucks, buses, etc. c.2. rail cars c.3. other forms of transport units c.4. containers on transport units c.5. general cargo c.6. dangerous goods d. Hazards associated with roll-on roll-off vessels may include: <ul style="list-style-type: none"> d.1. loss of watertight integrity due to accident or incorrect procedures for opening, closing and securing the hull openings of the vessel d.2. instability of vessel due to incorrect distribution of the loading d.3. incorrectly lashed or secured cargo/vehicles, rail cars or other transport units d.4. poor ventilation on vehicle decks or passenger spaces d.5. fire or explosion d.6. collision or grounding of vessel d.7. faulty cargo handling equipment d.8. damaged cargo d.9. cargo handling operations in poor weather or sea conditions d.10. incorrectly stowed dangerous cargo d.11. incorrectly stowed cargo d.12. incorrectly lashed or secured cargo/vehicles, rail cars or other transport units d.13. using equipment beyond safe working limits d.14. non-compliance with safe working procedures e. Measures to control the trim and stability of the vessel may include: <ul style="list-style-type: none"> e.1. adjusting weight distribution of load e.2. pumping ballast water to compensate for load distribution e.3. pumping of flooded compartments e.4. implementing damage control measures to maximise watertight integrity of hull where it has been damaged

Evidence Guide (continued)

APPLY SAFETY REGULATIONS ON ROLL-ON ROLL-OFF PASSENGER VESSELS

3. Sources of information / documents	a. Documentation / records may include a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. established vehicle loading/discharging procedures a.4. established passenger embarkation/disembarkation procedures a.5. passenger lists a.6. sections of the AMSA Marine Orders and the IMO STCW Code and Convention related to roll-on roll-off vessels a.7. 'Trim and Stability Booklet' a.8. material data safety sheets a.9. IMDG Code a.10. vessel manufacturer's instructions and recommended procedures a.11. OHS procedures relevant to roll-on roll-off vessels a.12. instructions of relevant Maritime Authorities concerning the operation of roll-on roll-off vessels a.13. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include: a.1. sections of the IMO STCW 95 Code and Convention related to roll-on roll-off vessels a.2. relevant sections of AMSA Marine Orders a.3. IMDG Code a.4. Code of Practice for Cargo Stowage and Securing' a.5. MARPOL Convention a.6. SOLAS Convention a.7. instructions of relevant Maritime Authorities concerning the operation of roll-on roll-off vessels a.8. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

APPLY SAFETY REGULATIONS ON ROLL-ON ROLL-OFF PASSENGER VESSELS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Assist passengers in emergency situations a.2. Organise and implement mustering procedures a.3. Assist passengers en route to embarkation and mustering stations a.4. Ensure the operation and maintenance of equipment peculiar to roll-on roll-off vessels a.5. Ensure compliance with safety regulations peculiar to roll-on roll-off vessels a.6. Communicate effectively with others when applying safety regulations on roll-on roll-off passenger vessels
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a master or officer on a roll-on roll-off vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of IMO STCW 95 Code and AMSA Marine Orders applicable for roll-on roll-off vessels b. Relevant OH&S and pollution control legislation and policies c. The basic principles and trends in the design and the cargo handling systems on roll-on roll-off vessels, including: <ul style="list-style-type: none"> c.1. typical deck arrangements c.2. arrangements for the opening, closing and securing of bow, stern and side doors and ramps and associated systems c.3. factors that affect the stability, trim and stress on a roll-on roll-off vessel c.4. ventilation and atmosphere control systems c.5. arrangements for setting up and stowing retractable vehicle decks d. Procedures and regulatory requirements for loading and discharge of vehicles, rail cars and other cargo transport units e. Procedures and regulations for the embarkation and disembarkation of passengers f. Emergency procedures on roll-on roll-off vessels, including: <ul style="list-style-type: none"> f.1. organisation and implementation of musters f.2. assistance to passengers during emergencies f.3. demonstration of the use of personal life-saving equipment and appliances f.4. broadcasting of announcements in appropriate languages during emergencies and drills to convey critical guidance to passengers and crew g. The hazards associated with cargoes on roll-on roll-off vessels, including: <ul style="list-style-type: none"> g.1. an understanding of the types of hazards and their causes g.2. safety and hazard minimisation procedures used on roll-on roll-off vessels g.3. the design features of roll-on roll-off vessels which minimise or eliminate the major hazards g.4. the hazards of dangerous cargoes and the means to prevent incidents involving dangerous cargoes h. IMDG Code i. Materials data safety sheets and their correct use j. Principles and procedures for emergency operations on a roll-on roll-off vessel, including: <ul style="list-style-type: none"> j.1. the importance of developing emergency plans j.2. actions to be taken in the event of failure of services for vehicles, rail car or other cargo transport units carried j.3. actions to be taken following a collision or grounding j.4. the procedures for entry into and effecting a rescue from enclosed spaces k. Maritime communication techniques as they are applied in operations and procedures on a roll-on roll-off passenger vessel l. Mandatory knowledge and skills in personal survival techniques, fire fighting and fire prevention required of all seafarers, as per Section A VI/1 of the IMO STCW 95 Code
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to apply safety regulations to operations and procedures on a roll-on roll-off passenger vessel, and/or b. ensure the application of safety regulations to operations and procedures on a roll-on roll-off passenger vessel

Evidence Guide (continued)

APPLY SAFETY REGULATIONS ON ROLL-ON ROLL-OFF PASSENGER VESSELS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. assisting passengers in emergency situations a.2. organising and implementing mustering procedures a.3. assisting passengers en route to embarkation and mustering stations a.4. ensuring the operation and maintenance of equipment peculiar to roll-on roll-off vessels a.5. ensuring compliance with safety regulations peculiar to roll-on roll-off vessels <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of IMO STCW Convention and Code and AMSA Marine Orders b.2. OHS and pollution control regulations and hazard prevention policies and procedures b.3. ISM Code safety management system procedures and work instructions b.4. following on-board housekeeping processes b.5. pollution management processes b.6. effective communication with passengers and crew during both normal and emergency operations <p>c. Action taken promptly to report and/or rectify operational accidents and incidents in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MH1 01A PLAN VOYAGE AND CONDUCT NAVIGATION

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to plan the voyage of a commercial vessel of 500 gross tonnage or more and conduct navigation, including planning and navigation for all conditions by acceptable methods of plotting ocean tracks, routing in accordance with the 'General Principles on Ships' Routeing' and reporting as required by the 'Guidelines and Criteria for Ship Reporting Systems'.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Maintain navigational charts, nautical publications and related documentation</p>	<ul style="list-style-type: none"> a. Navigational charts, nautical publications and related documentation are stored and maintained in accordance with company procedures and chart/publication publisher' instructions b. Navigational charts, nautical publications and related documentation are filed in accordance with company procedures c. An inventory of navigational charts, nautical publications and related documentation is established and kept as required by company procedures d. Chart correction records are kept and applied to ensure charts in use reflect up to date information e. Navigational charts, nautical publications and related documentation are handled and used in ways that ensure continued availability, utility and length of life f. Navigational charts, nautical publications and related documentation are appropriately ordered/updated from relevant sources to ensure that available data needed for voyage planning and identification of navigational hazards is current
<p>2. Plan route for voyage</p>	<ul style="list-style-type: none"> a. Navigational hazards relevant to a proposed voyage are identified using relevant navigational charts, nautical publications and related documentation b. The route for a voyage is determined in accordance with operational instructions and navigational principles and taking due account of identified navigational hazards c. Critical points along the proposed route of the voyage are identified and recorded d. Actions to deal with the identified critical points are developed in accordance with navigational principles and practice and company procedures e. Potential navigational contingencies and problems that may occur along the planned route are identified and strategies for dealing with them developed and recorded
<p>3. Fix vessel's position</p>	<ul style="list-style-type: none"> a. Primary position fixing method is selected in accordance with prevailing conditions b. Position is fixed using the selected method c. Appropriate allowance is made for random, instrument, system and data errors d. Time interval between fixes is appropriate to the prevailing navigational conditions e. Verification of primary position fixing is regularly carried out using appropriate methods f. Performance checks and tests of navigation position fixing instruments and systems are carried out in accordance with company procedures and manufacturer's instructions g. Position of vessel is recorded in accordance with company procedures and regulatory requirements
<p>4. Document and report planned route</p>	<ul style="list-style-type: none"> a. Planned route for a vessel's voyage is recorded and reported in accordance with company procedures and regulatory requirements b. Plans and strategies for dealing with critical situations and contingencies along the route of a voyage are recorded

5. **Maintain and adjust vessel's course**

- a. Required alterations to the vessel's course or speed are made taking into account prevailing weather and sea conditions, the proximity and course of other vessels, relevant navigational hazards and overall passage plan requirements
- b. Alterations to the vessel's course and speed comply with Australian and international regulations for the avoidance of collision at sea
- c. Alterations to the vessel's course and speed are appropriate to prevailing circumstances and conditions
- d. Alterations to the vessel's course and speed are effective and do not put at risk the safety of the vessel or its passengers and crew or that of other vessels, passengers or crew
- e. Signals relevant for navigational manoeuvres are made at the appropriate time in accordance with Australian and international regulations
- f. Operational limits of vessel propulsion, steering, power systems and overall trim and stability are not exceeded during navigational manoeuvres

Range Of Variables

PLAN VOYAGE AND CONDUCT NAVIGATION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental navigational principles and procedures across a wide variety of navigational contexts, including navigation at high latitudes. Contribution to the development of a plan for a voyage is required with appropriate allowance for possible contingencies. Accountability and responsibility for self and others in planning a voyage and conducting navigation is involved. d. Work requires significant judgement in planning, technical and leadership functions related to planning and conducting a voyage for a vessel of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Voyages to be planned and conducted may include: <ul style="list-style-type: none"> b.1. any voyage navigable by the size and type of vessel concerned b.2. voyages in high latitudes b.3. passages through <ul style="list-style-type: none"> b.3.1. traffic separation schemes b.3.2. tidal restricted areas b.3.3. VTS controlled areas b.3.4. pilotage water under conditions of restricted visibility c. Navigation may occur in conditions of: <ul style="list-style-type: none"> c.1. clear visibility using visual navigational techniques c.2. restricted visibility using parallel indexing and/or electronic chart systems c.3. clear visibility using a combination of visual and electronic techniques d. Position fixing techniques may include: <ul style="list-style-type: none"> d.1. visual d.2. RADAR d.3. continuous position monitoring
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. Nautical Institute publications a.5. 'Nautical Almanac' a.6. 'General Principles on Ships' Routing' a.7. 'Guidelines and Criteria for Ship Reporting Systems' a.8. publications from the Australian Hydrographer or British Admiralty including radio signals, light lists, sailing directions, tide tables and chart catalogues a.9. navigational warning records a.10. IMO STCW Convention and Code a.11. AMSA Marine Orders a.12. annual and weekly notices to mariners a.13. vessel's log a.14. company procedures a.15. vessel manufacturer's instructions and recommended procedures a.16. instructions of relevant Maritime Authorities a.17. pilot instructions where relevant a.18. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S legislation a.5. Guidelines and Criteria for Ship Reporting Systems

Evidence Guide

PLAN VOYAGE AND CONDUCT NAVIGATION

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan a voyage for a vessel of 500 gross tonnage or more taking into account all relevant navigational hazards, including voyages in high latitudes a.2. Fix the position of a vessel using all acceptable methods a.3. Identify typical navigational hazards and make due allowance for them when planning a voyage a.4. Access, use and maintain navigational charts, nautical publications and related documentation a.5. Communicate effectively with others planning a voyage and conducting navigation a.6. Follow reporting procedures in accordance with the Guidelines and Criteria for Ship Reporting Systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a commercial vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and Convention and AMSA Marine Orders applicable for vessels of 500 gross tonnage and over b. Common methods of time measurement c. Methods used to approximate to the shape of the earth d. Procedures for fixing a celestial object's position with reference to a horizon-based system of coordinates e. Procedures for converting on set of coordinates to another f. Common astronomic phenomena as described in the Nautical Almanac including: the phases of the moon, twilight, solar eclipses, lunar eclipses, visible sunrise/set, tabulated times for sunrise/set, theoretical sunrise/set g. Procedures for the calculation of the height of tide for a given time at any place listed using tide tables h. Procedures for the use of Nautical Almanac data and information when planning and conducting a voyage, including calculation of errors due to common navigational approximations i. Equilibrium theory of tides for the major tide raising constituents j. Typical errors in common position fixing systems and their effect on observed positions k. Requirements for effective passage planning including contingency planning l. Information required for a typical effective passage plan m. Ordering procedures for navigational charts, nautical publications and related documentation n. Procedures for filing and maintaining navigational charts, nautical publications and related documentation in serviceable condition o. Vessel reporting systems and their use in planning and conducting a voyage p. Special techniques required for navigation in high latitudes q. Maritime communication techniques, including issuing of helm and engine orders and tug communications
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan a simulated voyage and conduct navigation using a marine simulator meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of latitudes and navigational hazards; and/or b. assist in the planning of an actual voyage and conducting navigation for a commercial vessel of 500 gross tonnage or more involving an appropriate range of latitudes and navigational hazards

Evidence Guide (continued)

PLAN VOYAGE AND CONDUCT NAVIGATION

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 planning a voyage and conducting navigation a.2 identifying and evaluating navigation problems and determining appropriate navigational solutions a.3 identifying and implementing improvements to voyage planning and navigation procedures a.4 applying required precautions relevant to voyage planning and navigation a.5 fixing the position of the vessel <p>b. Shows evidence of application of relevant workplace and regulatory procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 navigational regulations and hazard prevention policies and procedures b.4 reporting of vessel's position, route and navigational contingencies b.5 job procedures and navigational instructions b.6 use of relevant nautical publications and charts b.7 procedures for the storage and maintenance of nautical publications and charts <p>c. Action is taken promptly to report and/or rectify navigational errors and contingencies in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MH2 01A DETERMINE POSITION OF THE VESSEL AND THE ACCURACY OF THE RESULTANT POSITION

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to determine the position of a commercial vessel and to determine the accuracy of the resultant position by any means. This includes determining and allowing for compass errors.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Determine the position of a vessel</p>	<ul style="list-style-type: none"> a. Primary position fixing method is selected in accordance with prevailing conditions b. Position is fixed using the selected method c. Appropriate allowance is made for random, instrument, system and data errors d. Time interval between fixes is appropriate to the prevailing navigational conditions e. Verification of primary position fixing is regularly carried out using appropriate methods f. Performance checks and tests of navigation position fixing instruments and systems are carried out in accordance with company procedures and manufacturer's instructions g. Position of vessel is recorded in accordance with company procedures and regulatory requirements
<p>2. Allow for compass errors in the fixing of a vessel's position</p>	<ul style="list-style-type: none"> a. Regulations relating to the use of the vessel's compasses are accessed and interpreted b. The intensity and direction of the earth's magnetic field is determine with the aid of the relevant charts c. Inspect and maintain vessel's compasses in accordance with manufacturer's instructions and standard marine practice as described in relevant maritime publications d. Vessel's magnetic compass is compensated and a compass adjuster's declaration is presented on completion e. Errors in the use of a gyro compass are determined and appropriate allowances made
<p>3. Record a vessel's position</p>	<ul style="list-style-type: none"> a. The vessel's position is recorded on a chart and in the vessel's log in accordance with company procedures b. The estimated accuracy of the vessel's position including allowances for compass errors is recorded in the vessel's log in accordance with company procedures

Range Of Variables

DETERMINE POSITION OF THE VESSEL AND THE ACCURACY OF THE RESULTANT POSITION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental nautical principles and complex manoeuvring techniques across a wide and often unpredictable variety of operational contexts. Contribution to the development of a broad plan, budget or strategy for vessel operations is required and accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to manoeuvring operations and procedures for vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Fixing of a vessel's position may be carried out <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. while at anchor or moored c. Instrumentation and equipment used in fixing a vessel's position may include: <ul style="list-style-type: none"> c.1. Radar equipment including ARPA c.2. Loran C Navigation System c.3. GPS and DGPS satellite navigation systems c.4. ECS and ECDIS systems c.5. Integrated navigation systems c.6. magnetic compasses c.7. gyro compasses c.8. gyro repeaters c.9. chronometers c.10. sextants c.11. azimuth mirrors c.12. azimuth vanes c.13. pelorus c.14. doppler and electromagnetic logs c.15. echo sounders
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW 95 Code and Convention a.5. AMSA Marine Orders a.6. vessel's log a.7. relevant marine navigation publications a.8. company procedures a.9. navigation instruments and equipment manufacturers' instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. pilot instructions where relevant a.12. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. IMO SOLAS Convention

Evidence Guide

DETERMINE POSITION OF THE VESSEL AND THE ACCURACY OF THE RESULTANT POSITION

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Fix the position of a vessel using the range of navigational instruments and equipment found on a commercial vessel of 500 gross tonnage or more a.2. Determine errors in navigational instruments and compasses and make due allowance in the position of the vessel a.3. Identify problems in fixing the position of a vessel and take appropriate action a.4. Communicate effectively with others during position fixing operations a.5. Record the vessel's position in accordance with company procedures and regulatory requirements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a commercial vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW Convention and Codes and AMSA Marine Orders applicable for vessels of 500 gross tonnage and over as they relate to the fixing of a vessel's position and the use of a vessel's compasses b. IMO SOLAS Convention c. Methods for fixing the position of a vessel d. Navigational instruments, equipment and systems typically found on commercial vessels of 500 gross tonnage or more and their operating characteristics and applications e. Procedures for using relevant navigational instruments and equipment to fix the position of a vessel by various methods f. Problems experienced when fixing the vessel's position and appropriate action and solutions g. Limitations and errors in electronic navigation instruments h. Principles of operation of magnetic and gyro compasses i. Construction and features of compasses, including: <ul style="list-style-type: none"> i.1. a magnetic compass and binnacle i.2. a transmitting magnetic compass i.3. a gyro compass j. Typical operational characteristics for different types of vessel's compasses k. Principles of compass compensation l. Knowledge of the effects of a vessel's magnetic field m. Procedures for the use of published charts to determine the intensity and direction of the earth's magnetic field n. Procedures for making allowance for compass errors o. The causes of deviation and changes in deviation p. AMSA Marine Orders Part 21 as it relates to magnetic compasses q. Procedures for the maintenance and adjustment of vessel's compasses r. Procedures for compensating a vessel's magnetic compass and presenting a compass adjuster's declaration on completion s. Procedures for determining the correct balance of Flinder's bar and F and A magnets
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of assignments, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to fix the position of a vessel using the typical range of navigational instruments and equipment found on a commercial vessel of 500 gross tonnage or more, and/or b. assist in the fixing of a vessel's position on board an operational commercial or training vessel

Evidence Guide (continued)

DETERMINE POSITION OF THE VESSEL AND THE ACCURACY OF THE RESULTANT POSITION

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 completing manoeuvring operations a.2 identifying and evaluating manoeuvring problems and determining an appropriate courses of action a.3 identifying and implementing improvements to manoeuvring procedures a.4 applying safety precautions relevant to manoeuvring operations a.5 assessing operational capability of vessel and manoeuvring plant and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.6 following on-board housekeeping processes c. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MH3 01A MANAGE SAFE NAVIGATION THROUGH THE USE OF RADAR AND OTHER NAVIGATIONAL AIDS

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to manage the safe navigation of a commercial vessel through the use of radar and other navigational aids, including automatic radar plotting aids (ARPA). This includes initialisation and operation of radar and other modern navigational systems, interpreting all available navigational data and making, and implementing command decisions for avoiding collisions and directing the safe navigation of the vessel.

The unit is consistent with the related functional standard in Section A II/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate electronic navigational systems</p>	<ul style="list-style-type: none"> a. Radar or ARPA is initialised and set up to track other vessels b. Radar or ARPA is operated in accordance with company procedures and manufacturer's instructions to produce data on the position of other vessels and fixed objects c. An ARPA is initialised to acquire and track vessels in both manual and automatic acquisition modes d. A radar plot is constructed on a radar plotting sheet using systematic radar observations e. Relevant electronic navigational aids are initialised and used in accordance with procedures and manufacturer's instructions to assist in the safe navigation of the vessel
<p>2. Interpret and evaluate information from electronic navigational systems</p>	<ul style="list-style-type: none"> a. Data on the radar plotting sheet is interpreted and analysed to anticipate potential collisions b. Data produced by other electronic navigational aids is interpreted and used to assist navigational command decisions, taking into account known limitations and errors associated with each type of aid c. Information obtained through the a single vessel or multiple vessel analysis of the radar plots or other electronic navigation data is used to make command decisions on action needed to avoid collision d. Radar data is used to obtain a position fix for the vessel using electronic bearing lines and variable range markers
<p>3. Maintain navigational records</p>	<ul style="list-style-type: none"> a. Radar plotting sheets used to analyse navigational situations and to make command decisions are stored in accordance with company procedures and regulatory requirements b. Records of navigational data produced by electronic navigational aids are stored electronically or in hard copy as required by company procedures and regulatory requirements c. Details of navigational command decisions made on the basis of data produced from the use of radar, ARPA and other electronic navigational aids are recorded in the vessel's log as required by company procedures and regulatory requirements

Range Of Variables

MANAGE SAFE NAVIGATION THROUGH THE USE OF RADAR AND OTHER NAVIGATIONAL AIDS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of the principles and procedures of electronic navigation systems to assist the safe navigation of a vessel across a wide and often unpredictable variety of navigational situations. Contribution to the development of plans and procedures for the use of electronic navigational aids to maintain the safe navigation of the vessel is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the use of electronic navigational aids to maintain the safe navigation of commercial vessels of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Electronic navigational aids may be operated to support command navigational decisions: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Electronic navigational aids may include: <ul style="list-style-type: none"> c.1. radar c.2. automatic radar plotting aid (ARPA) c.3. hyperbolic navigation systems c.4. Loran C navigation system c.5. ECS and ECDIS systems c.6. Integrated navigation systems d. The use of electronic navigational aids to assist safe navigation may include: <ul style="list-style-type: none"> d.1. avoidance of collision with another vessel d.2. fixing the position of the vessel d.3. tracking of other vessels d.4. assistance in making of command navigational decisions d.5. navigating during search and rescue operations
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. SOLAS requirements a.3. operational orders a.4. navigational charts a.5. radar plotting charts a.6. International Regulations for Preventing Collisions at Sea a.7. IMO STCW Convention and Code a.8. AMSA Marine Orders a.9. vessel's log a.10. company procedures for the use of navigational aids a.11. navigation systems manufacturers' instructions and recommended procedures a.12. instructions of relevant Maritime Authorities a.13. relevant Australian and international standards

Range Of Variables (continued)

MANAGE SAFE NAVIGATION THROUGH THE USE OF RADAR AND OTHER NAVIGATIONAL AIDS

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. ISM Code a.3. relevant sections of AMSA Marine Orders a.4. SOLAS Convention a.5. International Regulations for the Prevention of Collisions at Sea a.6. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

MANAGE SAFE NAVIGATION THROUGH THE USE OF RADAR AND OTHER NAVIGATIONAL AIDS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Initialise and operate electronic navigation systems typically used in commercial vessels of 500 gross tonnage or more a.2. Interpret and analyse data generated by electronic navigation systems and use it to inform navigational command decisions a.3. Use data generated by electronic navigation systems to fix the position of the vessel a.4. Use data generated by electronic navigation systems to plot the tracks of other vessels a.5. Identify problems in the use of electronic navigation systems and take appropriate action a.6. Communicate effectively with others when using electronic navigational aids to assist in the safe navigation of the vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a commercial vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and Convention and AMSA Marine Orders applicable for vessels of 500 gross tonnage and over b. SOLAS requirements c. OHS regulations related to the safe use of electronic navigational aids d. ISM Code Safety Management System Procedures related to the use of electronic navigational aids e. The different types of electronic navigational aids including their features, key applications and operational characteristics f. Procedures for the initialisation and operation of radar, ARPA and various other types of electronic navigational aids g. The limitations and potential errors associated with each type of electronic navigational aid h. Methods for the interpretation and analysis of navigational data produced by radar, ARPA and various other types of electronic navigational aids including due allowance for the limitations and potential errors associated with each type of electronic navigational aid i. Procedures for the use of data generated by radar, ARPA and various other types of electronic navigational aids to assist in the safe navigation of the vessel j. Action required to avoid a close quarters situation based on the International Regulations for the Prevention of Collision at Sea k. Maritime communication techniques when using electronic navigation aids to assist in the safe navigation of a vessel l. Problems in the use of electronic navigation systems to aid the navigation and appropriate courses of action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out electronic navigation assignments or exercises using an appropriate electronic navigation simulator meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over a representative range of navigational incidents; and/or b. assist in the use of electronic navigational aids to maintain safe navigation during sea time on the voyage of a commercial or training vessel

Evidence Guide (continued)

MANAGE SAFE NAVIGATION THROUGH THE USE OF RADAR AND OTHER NAVIGATIONAL AIDS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 using electronic navigational aids to assist in the safe navigation of the vessel a.2 identifying and evaluating problems in the use of electronic navigational aids and the navigational data they produce and determining an appropriate courses of action a.3 identifying and implementing improvements to procedures for the use of electronic aids for the safe navigation of the vessel a.4 assessing and maintaining the operational capability of various types of electronic navigational aids <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of electronic navigational aids b.6 security procedures when using electronic navigational aids <p>c. Action taken promptly to report and/or rectify problems in the use of electronic navigational aids in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MH4 01A PLAN AND CONDUCT A PASSAGE AND DETERMINE POSITION

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to plan and conduct a passage and determine the position of a commercial vessel, including planning and conducting a passage for all conditions by acceptable methods of plotting ocean tracks, routing in accordance with the 'General Principles on Ships' Routeing' and reporting as required by the 'Guidelines and Criteria for Ship Reporting Systems'.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code and e AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Use and care for navigational charts, nautical publications and related documentation</p>	<p>a. Navigational charts, nautical publications and related documentation are handled and used in ways that ensure continued availability, utility and length of life</p> <p>b. Navigational charts, nautical publications and related documentation are stored and maintained in accordance with company procedures and chart/publication publisher' instructions</p> <p>c. Navigational charts, nautical publications and related documentation are filed in accordance with company procedures</p> <p>d. Navigational charts, nautical publications and related documentation are used for voyage planning and identification of navigational hazards in accordance with company procedures and accepted maritime practice</p>
<p>2. Plan route for voyage</p>	<p>a. Navigational hazards relevant to a proposed voyage are identified using relevant navigational charts, nautical publications and related documentation</p> <p>b. The route for a voyage is determined in accordance with operational instructions and navigational principles and taking due account of identified navigational hazards</p> <p>c. Critical points along the proposed route of the voyage are identified and recorded</p> <p>d. Actions to deal with the identified critical points are developed in accordance with navigational principles and practice and company procedures</p> <p>e. Potential navigational contingencies and problems that may occur along the planned route are identified and strategies for dealing with them developed and recorded</p>
<p>3. Fix vessel's position</p>	<p>a. Primary position fixing method is selected in accordance with prevailing conditions</p> <p>b. Position is fixed using the selected method using information derived from relevant navigational systems</p> <p>c. Checks are made for random, instrument, system and data errors and appropriate corrections and allowances are made to derived courses and bearings</p> <p>d. Time interval between fixes is appropriate to the prevailing navigational conditions</p> <p>e. Verification of primary position fixing is regularly carried out using appropriate methods</p> <p>f. Performance checks and tests of navigation position fixing instruments and systems are carried out in accordance with company procedures and manufacturer's instructions</p> <p>g. Position of vessel is recorded in accordance with company procedures and regulatory requirements</p>

<p>4. Conduct a passage</p>	<ul style="list-style-type: none"> a. Measurements and observations of sea and weather conditions are accurate and appropriate to the planned passage of the vessel b. Meteorological information and observations of sea and weather conditions are correctly interpreted and applied to decisions on the vessel's speed and direction c. Information from navigation systems is interpreted and applied to identify navigational hazards and to fix the vessel's position and to inform decisions concerning the vessel's speed and direction d. The selection of the mode of steering is the most appropriate for the prevailing weather, sea and traffic conditions and intended manoeuvres e. Required alterations to the vessel's course or speed are made taking into account prevailing weather and sea conditions, the proximity and course of other vessels, relevant navigational hazards and overall passage plan requirements f. Alterations to the vessel's course and speed comply with Australian and international regulations for the avoidance of collision at sea g. Alterations to the vessel's course and speed are appropriate to prevailing circumstances and conditions h. Alterations to the vessel's course and speed are effective and do not put at risk the safety of the vessel or its passengers and crew or that of other vessels, passengers or crew i. Signals relevant for navigational manoeuvres are made at the appropriate time in accordance with Australian and international regulations j. Operational limits of vessel propulsion, steering, power systems and overall trim and stability are not exceeded during navigational manoeuvres
<p>5. Document and report planned route and passage</p>	<ul style="list-style-type: none"> a. Planned route for a vessel's voyage is recorded and reported in accordance with company procedures and regulatory requirements b. Plans and strategies for dealing with critical situations and contingencies along the route of a voyage are recorded c. Details of a passage including navigational incidents and related action taken are recorded in the vessel's log in accordance with company procedures and regulatory requirements

Range Of Variables

PLAN AND CONDUCT A PASSAGE AND DETERMINE POSITION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations and IMO Conventions and Codes including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account. b. Work is performed as a member of a bridge team under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental navigational principles and procedures across a wide variety of navigational contexts, including navigation at high latitudes. Contribution to the development of a plan for a voyage is required as a member of a bridge team with appropriate allowance for possible contingencies. Limited accountability and responsibility for self and others in planning a voyage and conducting navigation is involved. d. Work requires judgement and teamwork in planning, technical and operational functions related to devising and conducting the passage of a commercial vessel of 500 gross tonnage or more.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more b. Voyages to be planned and conducted may include: <ul style="list-style-type: none"> b.1. any voyage navigable by the size and type of vessel concerned b.2. voyages in high latitudes b.3. passages through <ul style="list-style-type: none"> b.3.1. traffic separation schemes b.3.2. tidal restricted areas b.3.3. VTS controlled areas b.3.4. pilotage water under conditions of restricted visibility c. Navigation may occur in conditions of: <ul style="list-style-type: none"> c.1. clear visibility using visual navigational techniques c.2. restricted visibility using parallel indexing and/or electronic chart systems c.3. clear visibility using a combination of visual and electronic techniques d. Instrumentation and equipment used for navigation and fixing a vessel's position may include: <ul style="list-style-type: none"> d.1. radar d.2. automatic radar plotting aid (ARPA) d.3. hyperbolic navigation systems d.4. Loran C Navigation System d.5. GPS and DGPS satellite navigation systems d.6. ECS and ECDIS systems (Note: ECDIS systems are considered to be included under the term 'charts' under the IMO STCW Convention and Code) d.7. Integrated navigation systems d.8. magnetic compasses d.9. gyro compasses d.10. gyro repeaters d.11. chronometers d.12. sextants d.13. azimuth mirrors d.14. azimuth vanes d.15. pelarus d.16. doppler and electromagnetic logs d.17. echo sounders e. The use of navigational aids to assist safe navigation may include: <ul style="list-style-type: none"> e.1. avoidance of collision with another vessel e.2. fixing the position of the vessel e.3. tracking of other vessels e.4. assistance in making of command navigational decisions e.5. navigating during search and rescue operations f. Position fixing techniques may include: <ul style="list-style-type: none"> f.1. visual f.2. RADAR f.3. continuous position monitoring

Range Of Variables (continued)

PLAN AND CONDUCT A PASSAGE AND DETERMINE POSITION

VARIABLE	SCOPE
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.1. operational orders a.2. navigational charts a.3. Nautical Institute publications a.4. 'Nautical Almanac' a.5. 'General Principles on Ships' Routeing' a.6. 'Guidelines and Criteria for Ship Reporting Systems' a.7. publications from the Australian Hydrographer or British Admiralty including radio signals, light lists, sailing directions, tide tables and chart catalogues a.8. navigational warning records a.9. IMO STCW 95 Convention and Code a.10. AMSA Marine Orders a.11. annual and weekly notices to mariners a.12. vessel's log a.13. company procedures a.14. vessel manufacturer's instructions and recommended procedures a.15. instructions of relevant Maritime Authorities a.16. pilot instructions where relevant a.17. relevant Australian and international standards <p>(Note: ECDIS systems are considered within the IMO STCW 95 Code and Convention to be included under the term navigational 'charts')</p>
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory OH&S legislation a.5. Guidelines and Criteria for Ship Reporting Systems

Evidence Guide

PLAN AND CONDUCT A PASSAGE AND DETERMINE POSITION

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan the passage of a commercial vessel of 500 gross tonnage or more taking into account all relevant navigational hazards a.2. Fix the position of a vessel using all acceptable methods a.3. Identify navigational hazards and make due allowance for them when planning a voyage a.4. Conduct the passage of a vessel of 500 gross tonnage or more as part of a bridge team taking into account all relevant navigational hazards a.5. Access, use and maintain navigational charts, nautical publications and related documentation a.6. Communicate effectively with others planning a voyage and conducting navigation a.7. Follow reporting procedures in accordance with the Guidelines and Criteria for Ship Reporting Systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer in charge of a navigational watch on a commercial vessel of 500 gross tonnage or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of IMO STCW 95 Code and Convention and AMSA Marine Orders b. Principles of navigation and passage planning c. Procedures for effective passage planning including contingency planning d. Information required to develop a typical effective passage plan e. Procedures for filing and handling navigational charts, nautical publications and related documentation in serviceable condition f. Principles and procedures for position fixing and navigation: <ul style="list-style-type: none"> f.1. the functions and principles of operations of various types of instrumentation used for planning and conducting a voyage and the correct procedures for their use f.2. procedures for performing and interpreting non-instrument observations f.3. procedures for accessing and interpreting information on weather and ocean conditions f.4. methods used to approximate to the shape of the earth f.5. common methods of time measurement f.6. procedures for fixing a celestial object's position with reference to a horizon-based system of coordinates f.7. procedures for converting on set of coordinates to another f.8. common astronomic phenomena as described in the Nautical Almanac including: the phases of the moon, twilight, solar eclipses, lunar eclipses, visible sunrise/set, tabulated times for sunrise/set, theoretical sunrise/set f.9. procedures for the calculation of the height of tide for a given time at any place listed using tide tables f.10. equilibrium theory of tides for the major tide raising constituents f.11. procedures for the use of nautical almanac data when planning and conducting a voyage, including calculation of errors due to common navigational approximations f.12. typical errors in common position fixing systems and their effect on observed positions f.13. special techniques required for navigation in high latitudes g. Methods for controlling vessel speed and direction h. Manoeuvring and engine characteristics for vessels of 500 gross tonnage or more, including stopping distances and turning circles at various draughts, speeds and loading i. Effects on vessel handling of wind, currents and bottom topography j. Manoeuvring problems for vessels of 500 gross tonnage or more and appropriate solutions k. Procedures for turning a vessel in various situations including: <ul style="list-style-type: none"> k.1. constant rate of turn techniques k.2. turning a vessel 'short turn around' k.3. turning a vessel on a reciprocal track in an emergency k.4. procedures for the use of rate of turn indicators for the safe handling of the vessel l. Procedures for the use of the automatic pilot for the steering of the vessel m. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' n. Vessel reporting systems and their use in planning and conducting a voyage o. Maritime communication techniques, including the use of standard marine terminology and the requirements for the issuing of helm and engine orders and tug communications

Evidence Guide (continued)

PLAN AND CONDUCT A PASSAGE AND DETERMINE POSITION

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan a simulated passage and conduct navigation using an approved marine simulator over an appropriate range of latitudes and navigational hazards; and/or b. assist in the planning of an actual voyage and conducting a passage for a commercial vessel of 500 gross tonnage or more involving an appropriate range of latitudes and navigational hazards
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning and conducting a passage a.2 identifying and evaluating navigation problems and determining appropriate navigational solutions a.3 identifying and implementing improvements to voyage planning and navigation procedures a.4 interpreting and applying information derived from navigational equipment and systems a.5 applying required precautions relevant to voyage planning and navigation a.6 fixing the position of the vessel b. Shows evidence of application of relevant workplace and regulatory procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW 95 Code and Convention and AMSA Marine Orders b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 navigational regulations and hazard prevention policies and procedures b.4 reporting of vessel's position, route and navigational contingencies b.5 job procedures and navigational instructions b.6 use of relevant nautical publications and charts b.7 procedures for the storage and maintenance of nautical publications and charts c. Action is taken promptly to report and/or rectify navigational errors and contingencies in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MH5 01A USE RADAR AND OTHER ELECTRONIC AIDS TO MAINTAIN SAFE NAVIGATION

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to maintain safe navigation of a commercial vessel through the use of radar and other navigational aids, including automatic radar plotting aids (ARPA). This includes initialisation and operation of radar and other modern navigational systems, interpreting all available navigational data and using it for avoiding collisions and ensuring the safe navigation of the vessel.

The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Set up radar and other electronic navigational aids	<ul style="list-style-type: none"> a. Relevant electronic navigational aids are initialised and used in accordance with established procedures and manufacturer's instructions to assist in the safe navigation of the vessel b. Operational performance and accuracy of the electronic navigation aids are confirmed and appropriate action taken where performance is out of limits c. Misrepresentations and false echoes are detected and discounted
2. Use radar and other electronic navigational aids	<ul style="list-style-type: none"> a. Radar and other electronic navigational aid is operated in accordance with manufacturer's instructions to produce data on the position of other vessels and fixed objects b. Data produced by the radar or electronic navigational aid is interpreted and used to assist navigational command decisions, taking into account known limitations and errors associated with each type of aid c. A radar plot is constructed on a radar plotting sheet using systematic radar observations d. Data on the radar plotting sheet is interpreted and analysed to anticipate potential collisions e. Information obtained through the a single vessel or multiple vessel analysis of the radar plots is used to make inform command decisions on action needed to avoid collision f. Radar plot is correctly construct and used to determine avoiding action when necessary g. Radar data is used to obtain a position fix for the vessel using electronic bearing lines and variable range markers
3. Maintain navigational records	<ul style="list-style-type: none"> a. Plotting sheets used to analyse navigational situations and to inform command decisions are stored in accordance with company procedures and regulatory requirements b. Records of navigational data produced by radar and other electronic navigational aids are stored electronically or in hard copy as required by company procedures and regulatory requirements

Range Of Variables

USE RADAR AND OTHER ELECTRONIC AIDS TO MAINTAIN SAFE NAVIGATION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the use of radar and other electronic aids to assist the safe navigation of a vessel across a wide and often unpredictable variety of navigational situations. Implementation of operational strategies and procedures for the use of radar and other electronic navigational aids to maintain the safe navigation of the vessel is required. Limited accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires judgement in operational functions related to the use of electronic navigational aids to maintain the safe navigation of a commercial vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Electronic navigational aids may be operated to support command navigational decisions: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Electronic navigational aids may include: <ul style="list-style-type: none"> c.1. radar c.2. automatic radar plotting aid (ARPA) c.3. hyperbolic navigation systems c.4. Loran C navigation system c.5. GPS and DGPS satellite systems as applied to navigation problems c.6. ECS and ECDIS systems c.7. Integrated navigation systems d. The use of electronic navigational aids to assist safe navigation may include: <ul style="list-style-type: none"> d.1. avoidance of collision with another vessel d.2. fixing the position of the vessel d.3. tracking of other vessels d.4. assistance in making of command navigational decisions d.5. navigating during search and rescue operations
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. operational orders a.3. navigational charts a.4. radar plotting charts a.5. International Regulations for Preventing Collisions at Sea a.6. ISM Code safety management system plans, procedures, checklists and instructions (where relevant) a.7. vessel's log a.8. company procedures for the use of navigational aids a.9. navigation systems manufacturers' instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. Australian USL Code a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

USE RADAR AND OTHER ELECTRONIC AIDS TO MAINTAIN SAFE NAVIGATION

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none">a. Assessment must confirm appropriate knowledge and skills to:<ul style="list-style-type: none">a.1. Initialise and operate electronic navigation aidsa.2. Interpret and analyse data generated by electronic navigation systems and use it to inform navigational command decisionsa.3. Use data generated by electronic navigation systems to fix the position of the vessela.4. Use data generated by electronic navigation systems to plot the tracks of other vesselsa.5. Identify typical problems in the use of electronic navigation systems and take appropriate actiona.6. Communicate effectively with others when using electronic navigational aids to assist in the safe navigation of the vessel
2. Interdependent assessment of units	<ul style="list-style-type: none">a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer on a commercial vessel.
3. Required knowledge and skills	<ul style="list-style-type: none">a. Knowledge of relevant maritime regulationsb. Terminology and principles of operation of electronic navigational aids typically used on vesselsc. The different types of electronic navigational aids including their features, key applications and operational characteristicsd. Procedures for the initialisation and operation of radar, ARPA and various other types of electronic navigational aidse. Techniques for the use of relevant electronic navigation systems including:<ul style="list-style-type: none">e.1. ARPAe.2. Loran C navigation systemse.3. GPS and DGPS satellite systems as applied to navigation problemse.4. ECS and ECDIS systemse.5. Integrated navigation systemsf. Principles and use of hyperbolic navigation systemsg. The limitations and potential errors associated with each type of electronic navigational aidh. Methods for the interpretation and analysis of navigational data produced by radar, ARPA and various other types of electronic navigational aids including due allowance for the limitations and potential errors associated with each type of electronic navigational aidi. Procedures for the use of data generated by radar, ARPA and various other types of electronic navigational aids to assist in the safe navigation of the vesselj. Maritime communication techniques when using electronic navigation aids to assist in the safe navigation of a vesselk. Typical problems in the use of electronic navigation systems to aid the navigation and appropriate courses of action and solutions
4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none">a. carry out electronic navigation assignments or exercises using an appropriate electronic navigation simulator over a representative range of navigational incidents; and/orb. use electronic navigational aids to maintain safe navigation during sea time on the voyage of a commercial or training vessel

Evidence Guide (continued)

USE RADAR AND OTHER ELECTRONIC AIDS TO MAINTAIN SAFE NAVIGATION

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 using electronic navigational aids to assist in the safe navigation of the vessel a.2 identifying and evaluating problems in the use of electronic navigational aids and the navigational data they produce and determining an appropriate courses of action a.3 identifying and implementing improvements to procedures for the use of electronic aids for the safe navigation of the vessel a.4 assessing operational capability of various types of electronic navigational aids <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures (where applicable) b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of electronic navigational aids b.6 security procedures when using electronic navigational aids <p>c. Action taken promptly to report and/or rectify problems in the use of electronic navigational aids in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MH6 01A PLAN AND CONDUCT A COASTAL PASSAGE AND DETERMINE POSITION

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to plan and conduct a coastal passage for a commercial vessel up to 80m in length, or 100m in length where gross tonnage does not exceed 3,000 gross tonnage, and determine the position of a vessel, including planning and conducting a coastal passage for all conditions by acceptable methods of plotting ocean tracks, routing in accordance with the 'General Principles on Ships' Routing' and reporting as required by the 'Guidelines and Criteria for Ship Reporting Systems'.

The unit is consistent with the related functional standard in Section A II/3 of the STCW 95 Code and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Use and care for navigational charts, nautical publications and related documentation</p>	<ul style="list-style-type: none"> a. Navigational charts, nautical publications and related documentation are handled and used in ways that ensure continued availability, utility and length of life b. Navigational charts, nautical publications and related documentation are stored and maintained in accordance with company procedures and chart/publication publisher' instructions c. Navigational charts, nautical publications and related documentation are filed in accordance with company procedures d. Navigational charts, nautical publications and related documentation are used for voyage planning and identification of navigational hazards in accordance with procedures and accepted maritime practice
<p>2. Plan route for voyage</p>	<ul style="list-style-type: none"> a. Navigational hazards relevant to a proposed voyage are identified using relevant navigational charts, nautical publications and related documentation b. The route for a voyage is determined in accordance with operational instructions and navigational principles and taking due account of identified navigational hazards c. Critical points along the proposed route of the voyage are identified and recorded d. Actions to deal with the identified critical points are developed in accordance with navigational principles and practice and company procedures e. Potential navigational contingencies and problems that may occur along the planned route are identified and strategies for dealing with them developed and recorded
<p>3. Fix vessel's position within a limited area</p>	<ul style="list-style-type: none"> a. Primary position fixing method is selected in accordance with prevailing conditions b. Position is fixed using the selected method using information derived from relevant navigational systems c. Checks are made for random, instrument, system and data errors and appropriate corrections and allowances are made to derived courses and bearings d. Time interval between fixes is appropriate to the prevailing navigational conditions e. Verification of primary position fixing is regularly carried out using appropriate methods f. Performance checks and tests of navigation position fixing instruments and systems are carried out in accordance with procedures and manufacturer's instructions g. Position of vessel is recorded in accordance with procedures and regulatory requirements

<p>4. Conduct a coastal passage</p>	<ul style="list-style-type: none"> a. Measurements and observations of sea and weather conditions are accurate and appropriate to the planned passage of the vessel b. Meteorological information and observations of sea and weather conditions are correctly interpreted and applied to decisions on the vessel's speed and direction c. Information from navigation systems is interpreted and applied to identify navigational hazards and to fix the vessel's position and to inform decisions concerning the vessel's speed and direction d. The selection of the mode of steering is the most appropriate for the prevailing weather, sea and traffic conditions and intended manoeuvres e. Required alterations to the vessel's course or speed are made taking into account prevailing weather and sea conditions, the proximity and course of other vessels, relevant navigational hazards and overall passage plan requirements f. Alterations to the vessel's course and speed comply with Australian and international regulations for the avoidance of collision at sea g. Alterations to the vessel's course and speed are appropriate to prevailing circumstances and conditions h. Alterations to the vessel's course and speed are effective and do not put at risk the safety of the vessel or its passengers and crew or that of other vessels, passengers or crew i. Signals relevant for navigational manoeuvres are made at the appropriate time in accordance with Australian and international regulations j. Operational limits of vessel propulsion, steering, power systems and overall trim and stability are not exceeded during navigational manoeuvres
<p>5. Document and report planned route and passage</p>	<ul style="list-style-type: none"> a. Planned route for a vessel's voyage is recorded and reported in accordance with procedures and regulatory requirements b. Plans and strategies for dealing with critical situations and contingencies along the route of a voyage are recorded c. Details of a passage including navigational incidents and related action taken are recorded in the vessel's log in accordance with procedures and regulatory requirements

Range Of Variables

PLAN A AND CONDUCT A COASTAL PASSAGE AND DETERMINE POSITION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work requires judgement and teamwork in planning, technical and operational functions related to devising and conducting the coastal passage of a vessel up to 80m in length, or 100m in length where gross tonnage does not exceed 3000 gross tonnage. c. Work is performed as a member of a bridge team under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of navigational principles and procedures across a range of coastal navigational contexts. Contribution to the development of a plan for a coastal voyage is required as a member of a bridge team with appropriate allowance for possible contingencies. Limited accountability and responsibility for self and others in planning a coastal voyage and conducting navigation is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 80m in length on coastal voyages, or 100m in length where gross tonnage does not exceed 3,000 gross tonnage b. Voyages to be planned and conducted may include: <ul style="list-style-type: none"> b.1. any coastal voyage navigable by the size and type of vessel concerned b.2. passages through <ul style="list-style-type: none"> b.2.1. traffic separation schemes in coastal areas b.2.2. tidal restricted areas b.2.3. VTS controlled areas b.2.4. pilotage water under conditions of restricted visibility c. Navigation may occur in conditions of: <ul style="list-style-type: none"> c.1. clear visibility using visual navigational techniques c.2. restricted visibility using parallel indexing and/or electronic chart systems c.3. clear visibility using a combination of visual and electronic techniques d. Instrumentation and equipment used for navigation and fixing a vessel's position may include: <ul style="list-style-type: none"> d.1. radar d.2. automatic radar plotting aid (ARPA) d.3. GPS and DGPS satellite navigation systems d.4. ECS and ECDIS systems (Note: ECDIS systems are considered to be included under the term 'charts' under the IMO STCW Convention and Code) d.5. Integrated navigation systems d.6. magnetic compasses d.7. gyro compasses d.8. gyro repeaters d.9. chronometers d.10. sextants d.11. azimuth mirrors d.12. azimuth vanes d.13. pelarus d.14. doppler and electromagnetic logs d.15. echo sounders e. The use of navigational aids to assist safe navigation may include: <ul style="list-style-type: none"> e.1. avoidance of collision with another vessel e.2. fixing the position of the vessel e.3. tracking of other vessels e.4. assistance in making of command navigational decisions e.5. navigating during search and rescue operations f. Position fixing techniques may include: <ul style="list-style-type: none"> f.1. visual <ul style="list-style-type: none"> f.1.1. landmarks f.1.2. aids to navigation such as lighthouses, beacons and buoys f.2. dead reckoning, taking into account winds tides currents and estimated speed f.3. electronic aids including RADAR f.4. continuous position monitoring

Range Of Variables (continued)

PLAN A AND CONDUCT A COASTAL PASSAGE AND DETERMINE POSITION

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts of coastal waters a.3. relevant maritime publications a.4. navigational warning records a.5. relevant maritime regulations a.6. annual and weekly notices to mariners a.7. vessel's log a.8. company procedures a.9. vessel manufacturer's instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. pilot instructions where relevant a.12. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. Australian USL Code a.2. relevant sections of IMO STCW 95 Code and Convention (where applicable) a.3. relevant sections of AMSA Marine Orders (where applicable) a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PLAN A AND CONDUCT A COASTAL PASSAGE AND DETERMINE POSITION

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan the passage of a vessel up to 80m in length or 100m in length where gross tonnage does not exceed 3,000 gross tonnage, on a coastal voyage, taking into account all relevant navigational hazards a.2. Fix the position of a vessel within coastal waters using all acceptable methods a.3. Identify typical navigational hazards and make due allowance for them when planning a coastal voyage a.4. Conduct the passage of a vessel up to 80m in length on coastal voyages, or 100m in length where gross tonnage does not exceed 3000 gross tonnage, taking into account all relevant navigational hazards a.5. Access, use and maintain navigational charts, nautical publications and related documentation a.6. Communicate effectively with others planning a coastal voyage and conducting navigation a.7. Follow reporting procedures in accordance with the Guidelines and Criteria for Ship Reporting Systems
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master on a commercial vessel up to 80m in length on coastal voyages, or 100m in length where gross tonnage does not exceed 3000 gross tonnage.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Principles and procedures of navigation and coastal passage planning including contingency planning c. Information required to develop a typical effective coastal passage plan d. Procedures for filing and handling navigational charts, nautical publications and related documentation in serviceable condition e. Common methods of time measurement f. Methods used to approximate to the shape of the earth g. Procedures for fixing a celestial object's position with reference to a horizon-based system of coordinates h. Procedures for calculating DR and EP due to current, tides and wind and course to steer i. Principles and procedures for fixing a vessel's position j. Procedures for converting one set of coordinates to another k. Common astronomic phenomena as described in the Nautical Almanac including: the phases of the moon, twilight, solar eclipses, lunar eclipses, visible sunrise/set, tabulated times for sunrise/set, theoretical sunrise/set l. Procedures for the calculation of the height of tide for a given time at any place listed using tide tables m. Procedures for the use of Nautical Almanac data and information when planning and conducting a voyage, including calculation of errors due to common navigational approximations n. Equilibrium theory of tides for the major tide raising constituents o. Errors in common position fixing systems and their effect on observed positions p. Methods for controlling vessel speed and direction q. Constant rate of turn techniques r. Manoeuvring and engine characteristics for vessels up to 80m in length on coastal voyages, or 100m in length where gross tonnage does not exceed 3000 gross tonnage, taking into account all relevant navigational hazards, including stopping distances and turning circles at various draughts, speeds and loading s. Effects on vessel handling of wind, currents and bottom topography t. Typical manoeuvring problems for vessels up to 80m in length on coastal voyages, or 100m in length where gross tonnage does not exceed 3000 gross tonnage, taking into account all relevant navigational hazards and appropriate action and solutions u. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' v. Vessel reporting systems and their use in planning and conducting a voyage w. Maritime communication techniques, including issuing of helm and engine orders and tug communications

Evidence Guide (continued)

PLAN A AND CONDUCT A COASTAL PASSAGE AND DETERMINE POSITION

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan a simulated coastal passage and conduct navigation using an appropriate marine simulator covering simulated coastal areas and across an appropriate range of navigational hazards; and/or b. assist in the planning and conduct of an actual passage for a for a commercial vessel up to 80m in length, or 100m in length where gross tonnage does not exceed 3000 gross tonnage, in coastal areas and across an appropriate range of navigational hazards.
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 planning and conducting a coastal passage a.2 identifying and evaluating navigation problems and determining appropriate navigational solutions a.3 identifying and implementing improvements to coastal voyage planning and navigation procedures a.4 interpreting and applying information derived from navigational equipment and systems a.5 applying required precautions relevant to coastal voyage planning and navigation a.6 fixing the position of the vessel in a coastal area b. Shows evidence of application of relevant workplace and regulatory procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 reporting of vessel's position, route and navigational contingencies b.3 job procedures and navigational instructions b.4 use of relevant nautical publications and charts b.5 procedures for the storage and maintenance of nautical publications and charts c. Action is taken promptly to report and/or rectify navigational errors and contingencies in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	2	3	2	2

TDM MH7 01A **APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL**

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to predict meteorological and ocean conditions and apply them to ensure the safe navigation of a small commercial vessel, including deciphering and applying information obtained from observations, reports and instruments, reliably and accurately calculating tides in accordance with official tide charts and forecasting weather for an intended near coastal voyage using all available data.

The unit is consistent with the relevant functional standard in the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Obtaining and deciphering weather and oceanographic information</p>	<ul style="list-style-type: none"> a. Ocean and weather conditions are observed and correctly interpreted in accordance with established nautical and meteorological practice b. Basic measurements of meteorological parameters are correctly made and recorded using established procedures c. Relevant meteorological charts, publications and related documentation are updated, stored and maintained d. Weather information is accessed on the Internet, where applicable e. Relevant navigational charts, nautical publications and related documentation are used for voyage planning and identification of navigational hazards in accordance with established procedures
<p>2. Applying weather and oceanographic data to safe navigation</p>	<ul style="list-style-type: none"> a. Weather and ocean condition hazards relevant to a proposed voyage are identified using relevant forecasts based on interpretation of meteorological observations, reports and measurements b. The route for a voyage is modified as required to take into account weather and sea condition hazards in accordance with established navigational practice and operational instructions
<p>3. Maintain records of weather and oceanographic information and forecasts</p>	<ul style="list-style-type: none"> a. Meteorological measurements, observations, reports and forecasts are recorded and filed in accordance with company procedures and regulatory requirements b. Modifications to the routing of a planned coastal voyage due to forecast weather and ocean condition hazards are recorded and filed in accordance with established procedures

Range Of Variables

APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in accordance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs in relation to specified quality standards. It involves the interpretation of meteorological, observations, reports and instrument measurements to the forecasting of weather and ocean conditions and the application of those forecasts to safe passage planning and navigation. c. Some discretion and judgement is required in interpreting meteorological data and forecasts, related navigational hazards and contingencies and the actions to be taken in these eventualities.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel engaged on near coastal voyages b. Voyages being planned and conducted may include: <ul style="list-style-type: none"> b.1. any near coastal voyage navigable by the size and type of vessel concerned b.2. passages through <ul style="list-style-type: none"> b.2.1. traffic separation schemes in near coastal areas b.2.2. tidal restricted areas b.2.3. VTS controlled areas b.2.4. pilotage water under conditions of restricted visibility c. Navigation may occur in conditions of: <ul style="list-style-type: none"> c.1. clear visibility using visual navigational techniques c.2. restricted visibility using parallel indexing and/or electronic chart systems c.3. clear visibility using a combination of visual and electronic techniques d. Instruments may include: <ul style="list-style-type: none"> d.1. air and sea thermometers d.2. barometers d.3. hydrometers d.4. anemometers d.5. wind strength and direction instruments d.6. instruments for measuring sea swell height, direction and period e. Meteorological and oceanographic parameters may include: <ul style="list-style-type: none"> e.1. atmospheric pressure e.2. pressure gradient e.3. air temperature e.4. relative humidity e.5. wind strength e.6. wind direction e.7. swell height, direction and period e.8. visibility e.9. cloud cover
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts of near coastal waters a.3. meteorological and oceanographic publications a.4. coastal weather reports, charts and satellite images a.5. annual and weekly notices to mariners a.6. publications from the Australian Hydrographer including radio signals, light lists, sailing directions, tide tables and chart catalogues a.7. navigational warning records a.8. Australian USL Code a.9. vessel's log a.10. company procedures a.11. vessel manufacturer's instructions and recommended procedures a.12. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Sections of Australian USL Code related to weather forecasting and navigation a.2. AMSA Marine Orders related to weather forecasting and navigation (where applicable) a.3. International Regulations for Preventing Collisions at Sea a.4. relevant Guidelines and Criteria for Ship Reporting Systems

Evidence Guide

APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Obtain and decipher weather and oceanographic data collected from observations, reports, charts, satellite images and instruments a.2. Forecast weather and ocean conditions and apply them to the planning of a near coastal passage a.3. Identify and evaluate weather forecasting problems and determine appropriate solutions a.4. Access, use and maintain meteorological charts, meteorological publications and related weather and oceanographical documentation a.5. Use weather forecasts to ensure safe navigation a.6. Keep appropriate records of weather and oceanographic information and weather forecasts
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master of a small commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant regulations dealing with weather forecasting and navigation applicable for vessels on near coastal voyages b. Principles and procedures of weather forecasting using information obtained from observations, reports and instruments including: <ul style="list-style-type: none"> b.1. vertical division of the atmosphere b.2. air masses and fronts b.3. cloud classifications b.4. heat exchange process b.5. synoptic chart analysis b.6. pressure systems, cold and warm fronts b.7. cyclones, storms and gales b.8. tropical meteorology b.9. ocean currents b.10. weather data provided by shipboard instruments b.11. sea state b.12. tide prediction b.13. use of tide tables c. Basic principles and procedures for making meteorological and oceanographic measurements using appropriate instruments and interpreting and deciphering the results d. Sources of weather and oceanographic reports and methods for their interpretation e. Procedures for the application of forecast of likely weather and oceanic conditions to the development of a typical coastal passage plan f. Procedures for filing and handling weather and oceanographic reports, records of observations and instrument readings g. Procedures for the calculation of the height of tide for a given time at any place listed using tide tables h. Effects on navigation and shiphandling of wind, currents and bottom topography i. Problems in the forecasting of weather and oceanographic information to navigation of a vessel and appropriate action and solutions j. Procedures to be followed during gale conditions and cyclones including the means of securing a vessel in a cyclone mooring k. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. a range of suitably simulated practical and knowledge assignments and exercises that demonstrate the ability to collect appropriate weather and oceanographic data from observations, reports and basic measurements using shipboard instruments and apply them to the safe navigation of a vessel, and/or b. collect weather and oceanographic data from observations, reports and basic measurements and apply them to the safe navigation of an operational commercial or training vessel on a near coastal voyage

Evidence Guide (continued)

APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 observing weather and ocean conditions a.2 using shipboard instruments to collect basic meteorological and oceanographic data a.3 obtaining and deciphering weather and oceanographic data collected from observations, charts, reports, satellite images and instruments a.4 forecasting weather and ocean conditions and applying the forecasts to the planning and conduct of a near coastal passage a.5 identifying and evaluating weather forecasting problems and determining appropriate solutions <p>b. Shows evidence of application of relevant workplace and regulatory procedures including:</p> <ul style="list-style-type: none"> b.1 relevant regulations b.2 established procedures for the forecasting local weather and ocean conditions in near coastal waters b.3 navigational regulations and hazard prevention policies and procedures b.4 reporting of vessel's position, route and navigational contingencies b.5 job procedures and instructions on the use of meteorological instruments, reports and observations b.6 use of relevant meteorological publications, charts and satellite images b.7 procedures for the storage and maintenance of meteorological publications and charts <p>c. Action is taken promptly to report and take account of adverse weather forecasts in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	1	1	2	2

TDM MH8 01A PLAN AND NAVIGATE AN INSHORE PASSAGE

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to plan and navigate an inshore passage for a small commercial vessel and determine the vessel's position. This includes the use of coastal navigational charts to plan and conduct the passage and the application of coastal navigational techniques involving a range of instrumentation and navigational aids.

The unit is consistent with the related functional standard in the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Use and care for coastal navigational charts, nautical publications and related documentation</p>	<ul style="list-style-type: none"> a. Coastal navigational charts, nautical publications and related documentation are handled and used in ways that ensure continued availability, utility and length of life b. Navigational charts, nautical publications and related documentation are stored and maintained in accordance with established procedures and chart/publication publisher' instructions c. Navigational charts, nautical publications, notices to mariners and related documentation are filed in accordance with established procedures d. Coastal navigational charts, nautical publications, notices to mariners and related documentation are correctly used for voyage planning and identification of navigational hazards
<p>2. Plan route for inshore voyage</p>	<ul style="list-style-type: none"> a. Navigational hazards relevant to a proposed inshore voyage are identified using relevant navigational charts, nautical publications and related documentation b. The route for an inshore voyage is determined in accordance with operational instructions and navigational principles and taking due account of identified navigational hazards c. Critical points along the proposed route of the voyage are identified and recorded d. Appropriate actions to deal with the identified critical points are developed e. Potential navigational contingencies and problems that may occur along the planned inshore route are identified and appropriate strategies for dealing with them are developed and recorded
<p>3. Conduct an inshore passage</p>	<ul style="list-style-type: none"> a. Measurements and observations of sea and weather conditions are accurate and appropriate to the planned inshore passage of the small vessel b. Meteorological information and observations of sea and weather conditions are correctly interpreted and applied to decisions on the vessel's speed and direction c. Information from navigation systems is interpreted and applied to identify navigational hazards and to fix the small vessel's position and to enable decisions to be made concerning the vessel's speed and direction d. The selection of the mode of steering is the most appropriate for the prevailing weather, sea and traffic conditions and intended manoeuvres e. Required alterations to the small vessel's course or speed are made taking into account prevailing weather and sea conditions, the proximity and course of other vessels, relevant navigational hazards, buoyage, signage and overall passage plan requirements f. Alterations to the small vessel's course and speed are appropriate to prevailing circumstances and conditions, comply with relevant maritime regulations and do not put at risk the safety of the small vessel or its passengers and crew or that of other vessels, passengers or crew g. Signals relevant for navigational manoeuvres are made at the appropriate time in accordance with Australian and international regulations h. Operational limits of vessel propulsion, steering, power systems and overall trim and stability are not exceeded during navigational manoeuvres

<p>4. Fix small vessel's position within a limited area</p>	<ul style="list-style-type: none"> a. Primary position fixing method is selected in accordance with prevailing conditions b. Position is fixed using the selected method using information derived from relevant navigational systems c. Checks are made for random, instrument, system and data errors and appropriate corrections and allowances are made to derived courses and bearings d. Time interval between fixes is appropriate to the prevailing navigational conditions e. Verification of primary position fixing is regularly carried out using appropriate methods f. Performance checks and tests of navigation position fixing instruments and systems are carried out in accordance with company procedures and manufacturer's instructions g. Position of small vessel is recorded in accordance with regulations and established procedures
<p>5. Document and report planned route and passage</p>	<ul style="list-style-type: none"> a. Planned route for a small vessel's inshore voyage is recorded and reported in accordance with procedures and regulations b. Plans and strategies for dealing with critical situations and contingencies along the route of an inshore voyage are recorded c. Details of a n inshore passage including navigational incidents and related action taken are recorded in the vessel's log in accordance with relevant maritime regulations

Range Of Variables

PLAN AND NAVIGATE AN INSHORE PASSAGE

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within defined operational procedures, with responsibility for own outputs and limited responsibility for others. It involves the application of nautical principles to the planning and conduct of an inshore passage and the fixing of a small vessel's position across a range of predictable inshore contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 24 metres in length engaged on an inshore passage. b. Voyages to be planned and conducted may include: <ul style="list-style-type: none"> b.1. any inshore voyage navigable by the size and type of small vessel concerned b.2. passages through <ul style="list-style-type: none"> b.2.1. traffic separation schemes in inshore areas b.2.2. tidal restricted areas b.2.3. VTS controlled areas c. Navigation may occur in conditions of: <ul style="list-style-type: none"> c.1. clear visibility using visual navigational techniques c.2. restricted visibility using parallel indexing and/or electronic chart systems c.3. clear visibility using a combination of visual and electronic techniques d. Instrumentation and equipment used for navigation and fixing a small vessel's position may include: <ul style="list-style-type: none"> d.1. RADAR d.2. GPS satellite navigation systems d.3. integrated navigation systems d.4. magnetic compasses d.5. gyro compasses and repeaters d.6. chronometers and sextants d.7. azimuth mirrors and vanes d.8. pelarus d.9. doppler and electromagnetic logs d.10. depth sounders e. The use of navigational aids to assist safe navigation may include: <ul style="list-style-type: none"> e.1. avoidance of collision with another vessel e.2. fixing the position of the small vessel e.3. tracking of other ships e.4. assistance in making of command navigational decisions e.5. navigating during search and rescue operations f. Position fixing techniques may include: <ul style="list-style-type: none"> f.1. visual <ul style="list-style-type: none"> f.1.1. landmarks f.1.2. aids to navigation such as lighthouses, beacons and bouys f.2. dead reckoning, taking into account winds tides currents and estimated speed f.3. RADAR f.4. continuous position monitoring
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. operational orders a.3. navigational charts of inshore waters a.4. annual and weekly notices to mariners a.5. navigational warning records a.6. small vessel's log a.7. small vessel manufacturer's instructions and recommended procedures a.8. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code a.2. regulations for preventing collisions at sea a.3. SOLAS Convention a.4. relevant international, Australian and State/Territory OH&S legislation a.5. Guidelines and Criteria for Ship Reporting Systems

Evidence Guide

PLAN AND NAVIGATE AN INSHORE PASSAGE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan the inshore passage of a small vessel up to 24 metres in length a.2. Fix the position of a small vessel within inshore waters using all acceptable methods a.3. Identify typical navigational hazards and make due allowance for them when planning an inshore voyage a.4. Conduct the passage of a small vessel up to 24 metres in length on an inshore voyage, taking into account all relevant navigational hazards a.5. Access, use and maintain coastal navigational charts, nautical publications and related documentation a.6. Communicate effectively with others planning an inshore voyage and conducting navigation a.7. Follow reporting procedures in accordance with the relevant maritime regulations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master on a small commercial vessel up to 24 metres in length engaged on an inshore voyage.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Principles and procedures of navigation and inshore passage planning including contingency planning c. Information required to develop a typical effective inshore passage plan d. Procedures for filing and handling navigational charts, nautical publications and related documentation in serviceable condition e. Principles and procedures for fixing a small vessel's position f. Procedures for converting one set of coordinates to another g. Procedures for the calculation of the height of tide for a given time at any place listed using tide tables h. Procedures for the use of Nautical Almanac data and information when planning and conducting an inshore voyage, including calculation of errors due to common navigational approximations i. Errors in common position fixing systems and their effect on observed positions j. Methods for controlling small vessel speed and direction k. Typical manoeuvring and engine characteristics for small vessels up to 24m in length on inshore voyages, including stopping distances and turning circles at various draughts, speeds and loading l. Effects on shiphandling of wind, currents and bottom topography m. Voyage planning and position fixing problems that may be experienced for small vessels on inshore voyages and appropriate action and solutions n. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' o. Small vessel reporting systems p. Ability to correct a magnetic compass direction/reading for variation and deviation q. Ability to correct a gyro compass direction for gyro errors
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. plan a simulated inshore passage and conduct navigation using an appropriate marine simulator in simulated coastal areas and across an appropriate range of navigational hazards; and/or b. assist in the planning and conduct of an actual passage for a for a small commercial vessel up to 24m in length engaged in an inshore voyage.

Evidence Guide (continued)

PLAN AND NAVIGATE AN INSHORE PASSAGE

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 planning and conducting an inshore passage a.2 identifying and evaluating navigation problems and determining appropriate navigational solutions a.3 interpreting and applying information derived from navigational equipment and systems a.4 applying required precautions relevant to coastal voyage planning and navigation a.5 fixing the position of the small vessel in an inshore area <p>b. Shows evidence of application of relevant workplace and regulatory procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 reporting requirements for small vessels b.3 job procedures and navigational instructions b.4 use of relevant nautical publications and charts b.5 procedures for the storage and maintenance of nautical publications and charts <p>c. Action is taken promptly to report and/or rectify navigational errors and contingencies</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MH9 01A FORECAST WEATHER AND OCEANOGRAPHIC CONDITIONS

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to forecast weather and oceanographic conditions during the voyage of a commercial vessel, including taking measurements of relevant meteorological and oceanographic parameters, observing current weather and ocean conditions and cloud formations, acquiring weather charts, reports and satellite images, interpreting available weather and oceanographic data, making forecasts of local weather and oceanographic conditions and taking appropriate action to adjust vessel operations based on local weather predictions.

The unit is consistent with the related functional standards in STCW 95 Code, AMSA Marine Orders and the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Collect and interpret weather and oceanographic data</p>	<ul style="list-style-type: none"> a. Ocean and weather conditions are observed and correctly interpreted in accordance with established nautical and meteorological practice b. Measurements of current local meteorological and oceanographic parameters are correctly made and recorded using appropriate shipboard instruments in accordance with established practice c. Meteorological charts, publications and related documentation are updated, stored and maintained in accordance with company procedures and chart/publication publisher' instructions d. Meteorological charts, publications and related documentation are handled and used in ways that ensure continued availability, utility and length of life e. Observations of weather and cloud formations are made and interpreted in accordance with established practice f. Weather charts and satellite images are acquired and interpreted g. Weather reports are obtained and interpreted
<p>2. Forecast local weather and oceanographic conditions</p>	<ul style="list-style-type: none"> a. A wave forecast is made based on observation of ocean and weather conditions and collected weather data b. Calculations are made for the height of the tide at a given time and place using appropriate tide charts and/or diagrams c. The effects of local topographical features on wind flow and weather conditions are correctly predicted from available information d. Forecasts of local weather and oceanographic conditions are correctly made using available weather information e. Potentially dangerous weather conditions are identified and correctly predicted and appropriate action is taken to secure the vessel
<p>3. Maintain records of weather and oceanographic information and forecasts</p>	<ul style="list-style-type: none"> a. Weather and oceanographic measurements, observations, reports and forecasts are recorded and filed in accordance with company procedures and regulatory requirements b. Action on vessel operations initiated as a result of weather and oceanographic forecasts is documented as required

Range Of Variables

FORECAST WEATHER AND OCEANOGRAPHIC CONDITIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations, codes and conventions. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of interpretation of meteorological information, observations, reports and instrument measurements to the forecasting of weather and ocean conditions.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Sources of weather and oceanographic data may include: <ul style="list-style-type: none"> b.1. measurements using appropriate instruments b.2. observations of local weather and ocean conditions and cloud formations b.3. weather charts b.4. visible and infra red satellite images b.5. weather reports b.6. tide tables and/or diagrams b.7. information on the effects of local topographical features on windflow and weather c. Instruments may include: <ul style="list-style-type: none"> c.1. air and sea thermometers c.2. barometers c.3. hydrometers c.4. anemometers c.5. wind strength and direction instruments c.6. instruments for measuring sea swell height, direction and period d. Meteorological and oceanographic parameters may include: <ul style="list-style-type: none"> d.1. atmospheric pressure d.2. pressure gradient d.3. air temperature d.4. relative humidity d.5. wind strength d.6. wind direction d.7. swell height, direction and period d.8. visibility d.9. cloud cover
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts of coastal waters a.3. meteorological and oceanographic publications a.4. coastal weather reports a.5. annual and weekly notices to mariners a.6. 'Nautical Almanac' a.7. navigational warning records a.8. relevant regulations, codes and conventions a.9. ship's log a.10. company procedures a.11. ship manufacturer's instructions and recommended procedures a.12. instructions of relevant Maritime Authorities a.13. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. USL Code a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation a.6. Guidelines and Criteria for Ship Reporting Systems

Evidence Guide

FORECAST WEATHER AND OCEANOGRAPHIC CONDITIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Make relevant measurements of meteorological and oceanographic parameters a.2. Acquire and interpret relevant weather and oceanographic information from appropriate sources a.3. Use available weather and oceanographic information to make a local forecast of weather and oceanographic conditions a.4. Take appropriate action to adjust vessel operations based on a local forecast of weather and oceanographic conditions
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations, codes and conventions b. Principles and procedures of weather forecasting using information obtained from observations, charts, satellite images, reports and instruments including: <ul style="list-style-type: none"> b.1. vertical division of the atmosphere b.2. air masses and fronts b.3. cloud classifications b.4. heat exchange process b.5. synoptic chart analysis b.6. pressure systems, cold and warm fronts b.7. cyclones, storms and gales b.8. tropical meteorology b.9. ocean currents b.10. weather data provided by shipboard instruments b.11. sea state b.12. tide prediction b.13. use of tide tables c. Basic principles and procedures for making meteorological and oceanographic measurements using appropriate instruments and interpreting and deciphering the results d. Procedures for the calculation of the height of tide for a given time at any place listed using tide tables e. Procedures for making a wave forecast f. Procedures for predicting topographical effects on wind flow g. Effects on navigation and shiphandling of wind, currents and bottom topography h. Typical problems in the forecasting of weather and oceanographic information and appropriate action and solutions i. Sources of weather and oceanographic reports and methods for their interpretation j. Procedures for the application of forecast of likely weather and oceanic conditions to vessel operations k. Procedures to be followed during gale conditions and cyclones including the means of securing a vessel in a cyclone l. Procedures for filing and handling weather and oceanographic reports, records of observations and instrument readings m. Maritime communication techniques
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. a range of suitably simulated practical and knowledge assignments and exercises that demonstrate the ability to collect appropriate weather and oceanographic data from observations, charts, satellite images, reports and basic measurements and make forecasts of local weather and oceanographic conditions, and/or b. collect weather and oceanographic data from observations, charts, satellite images, reports and basic measurements and make forecasts of local weather and oceanographic conditions when on an operational commercial or training vessel

Evidence Guide (continued)

FORECAST WEATHER AND OCEANOGRAPHIC CONDITIONS

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 observing weather and ocean conditions a.2 using shipboard instruments to collect basic meteorological and oceanographic data a.3 obtaining and deciphering weather and oceanographic data collected from observations, charts, satellite images, reports and basic measurements a.4 forecasting weather and ocean conditions and applying the forecasts to vessel operations a.5 identifying and evaluating weather forecasting problems and determining appropriate solutions b. Shows evidence of application of relevant workplace and regulatory procedures including: <ul style="list-style-type: none"> b.1 relevant regulations, codes and conventions b.2 job procedures and instructions on the use of meteorological instruments, reports and observations and the forecasting of local weather and oceanographic conditions b.3 use of relevant meteorological publications and charts b.4 procedures for the storage and maintenance of meteorological publications and charts c. Action is taken promptly to report and act upon adverse weather forecasts in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM MH10 01A NAVIGATE A HIGH SPEED VESSEL

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to safely navigate a high speed commercial vessel, including special watchkeeping and bridge team requirements when operating at high speed, constructing and applying a passage plan for a high speed vessel, using visual, radar and other navigational information for effective high speed navigation, using 'north-up' radar presentation at high speed, allowing for the manoeuvring characteristics of a high speed vessel, and applying the International Regulations for the Prevention of Collisions at Sea in the high speed context.

The unit is consistent with Chapter 18 of the International Code of Safety for High Speed Craft (HSC Code) and Chapter VIII of the STCW 95 Code regarding watchkeeping on vessels.

ELEMENT	PERFORMANCE CRITERIA
1. Construct a passage plan for a high speed craft	<ul style="list-style-type: none"> a. Information on prevailing weather, traffic density, operating zones and operational requirements are obtained and interpreted in accordance with high speed navigational procedures b. A passage plan for a high speed vessel is constructed in accordance with regulatory requirements and due allowance for prevailing conditions, traffic density and the manoeuvring characteristics of the high speed vessel c. Passage plan is documented and communicated to others in accordance with established procedures and relevant regulatory requirements
2. Organise bridge team and operations to fulfil high speed watchkeeping requirements	<ul style="list-style-type: none"> a. Command and control procedures when operating a vessel at high speed are carried out in accordance with regulatory requirements of the High Speed Craft Code and STCW 95 Code b. Bridge team duties are organised and reorganised to appropriately respond to changes in workload and emergencies when operating a craft at high speed c. Clear and timely operational and communication procedures are used at all times during high speed craft operation
3. Apply information from visual observation and other electronic aids	<ul style="list-style-type: none"> a. Information from visual observation, radar and other navigational aids and sources is appropriately used in combination to navigate the safe passage of a high speed craft b. Attention between visual, radar and other navigational information is divided to maximise safe operation when operating at high speed c. Details of navigational command decisions made on the basis of data produced from the use of radar, ARPA and other electronic navigational aids are recorded in the vessel's log as required by company procedures and regulatory requirements
4. Operate radar and ARPA at high speed	<ul style="list-style-type: none"> a. Radar is correctly operated during high speed operation using the 'north-up' presentation and CPAs of targets are accurately determined in accordance with established procedures b. Effective and timely alterations of course are made to clear collision situations in accordance with established high speed navigational procedures c. ARPA is effectively used during high speed operations d. Parallel index lines are correctly used to determine cross track error e. Techniques for determining course made good and alteration of course are applied in accordance with established procedures

- | | |
|---|---|
| 5. Use GPS, ECDIS and Radar for high speed navigation | <ul style="list-style-type: none">a. GPS/DGPS data is correctly obtained and interpretedb. GPS/DGPS position and waypoint information is effectively entered into the radar in accordance with established proceduresc. Radar maps for use in navigation are correctly constructedd. Radar target information is transferred to ECDIS in accordance with established procedures |
| 6. Ensure compliance with regulations when operating at high speed | <ul style="list-style-type: none">a. Requirements of the International Regulations for the Prevention of Collisions at Sea are correctly interpreted in the context of high speed vessel operationb. Rules of relative movement are applied when making alterations to the course of a vessel at high speedc. High speed craft is manoeuvred in accordance with the requirements of the International Regulations for the Prevention of Collisions at Sead. Safety and navigational incident involving a high speed craft are investigated and reported in accordance with the relevant maritime regulations |

Range Of Variables

NAVIGATE A HIGH SPEED VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant mandatory rules and regulations and IMO Conventions and Codes, including the relevant sections of the AMSA Marine Orders and International Code of Safety for the Operation of High Speed Craft. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of the relevant principles and procedures to effectively apply visual, electronic and other forms of navigation information to assist the safe navigation of a high speed craft across a wide and often unpredictable variety of navigational situations. Construction and implementation of a plan for a high speed passage is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, technical and leadership functions related to the integrated use of electronic navigational aids to maintain the safe navigation of commercial high speed craft.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel operating at speeds of in excess of 30 knots b. Navigation of a high speed craft may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. during both low and high speed operations b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Applicable certification speed bands for a high speed craft are: <ul style="list-style-type: none"> c.1. low speed – less than 30 knots c.2. high speed – 30 knots to 50 knots c.3. very high speed – 50 knots to 80 knots c.4. ultra high speed – more than 80 knots d. Electronic navigational aids may include: <ul style="list-style-type: none"> d.1. radar d.2. automatic radar plotting aid (ARPA) d.3. hyperbolic navigation systems d.4. Loran C navigation system d.5. ECS and ECDIS systems d.6. Integrated navigation systems e. The use of electronic navigational aids to assist safe navigation of a high speed vessel may include: <ul style="list-style-type: none"> e.1. avoidance of collision with another vessel e.2. fixing the position of the vessel e.3. tracking of other vessels e.4. assistance in making of command navigational decisions
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. International Code of Safety for the Operation of High Speed Craft a.2. ISM Code safety management system plans, procedures, checklists and instructions a.3. SOLAS requirements a.4. operational orders a.5. navigational charts a.6. radar plotting charts a.7. International Regulations for Preventing Collisions at Sea a.8. IMO STCW 95 Code and Convention a.9. AMSA Marine Orders a.10. vessel's log a.11. company procedures for the use of navigational aids a.12. vessel and navigation systems manufacturers' instructions and recommended procedures a.13. instructions of relevant Maritime Authorities a.14. Australian and international standards relevant to commercial high speed vessels

Range Of Variables (continued)

NAVIGATE A HIGH SPEED VESSEL

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. International Code of Safety for the Operation of High Speed Craft a.3. ISM Code a.4. relevant sections of AMSA Marine Orders a.5. SOLAS Convention a.6. International Regulations for the Prevention of Collisions at Sea a.7. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

NAVIGATE A HIGH SPEED VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Construct a passage plan for a high speed vessel a.2. Organise bridge team and operations to fulfil high speed watchkeeping requirements a.3. Ensure compliance with relevant maritime regulations when operating at high speed a.4. Initialise and operate electronic navigation systems typically used in high speed vessels a.5. Operate radar and ARPA during a high speed passage a.6. Use GPS, ECDIS and Radar for high speed navigation a.7. Interpret and analyse data generated by electronic navigation systems and use it to inform navigational command decisions in conjunction with visual information a.8. Apply information from visual observation and other electronic aids in appropriate combination a.9. Identify typical problems in the navigation of high speed vessels and take appropriate action a.10. Communicate effectively with others when navigating a high speed vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a commercial high speed vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations relevant to the navigation of a commercial high speed vessel including the International Code of Safety for the Operation of High Speed Craft b. International Regulations for the Prevention of Collisions at Sea c. SOLAS requirements d. OHS regulations related to the safe use of electronic navigational aids e. ISM Code Safety Management System Procedures related to the navigation of high speed vessels f. The different types of electronic navigational aids used on high speed craft including their features, key applications and operational characteristics g. Procedures for the initialisation and operation of radar, ARPA and various other types of electronic navigational aids h. The limitations and potential errors associated with each type of electronic navigational aid when used for high speed navigation i. Manoeuvring and engine characteristics for high speed vessels, including stopping distances and turning circles in various operational situations j. Procedures for the use of data generated by radar, ARPA and various other types of electronic navigational aids to assist in the safe navigation of a high speed vessel including the selection of the appropriate range for radar when operating at high speed k. Methods for the interpretation and analysis of navigational information during a high speed passage, including visual information and that produced by radar, ARPA and various other types of electronic navigational aids. This should include: <ul style="list-style-type: none"> k.1. concept of area of concern k.2. due allowance for the limitations and potential errors associated with each type of electronic navigational aid k.3. the use of parallel index lines to determine cross track error k.4. techniques for determining course made good and alteration of position l. Action and precautions required to avoid a potential collision situations when operating a high speed vessel based on the International Code of Safety for the Operation of High Speed Craft and the International Regulations for the Prevention of Collision at Sea m. Maritime communication techniques when operating a high speed vessel n. Problems in the navigation of a high speed vessel and appropriate courses of action and solutions

Evidence Guide (continued)

NAVIGATE A HIGH SPEED VESSEL

4. Resource implications	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. carry out assignments or exercises on the navigation of a high speed vessel using an appropriate electronic navigation simulator meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over a representative range of navigational incidents for the speed bands for which the person is being assessed; and/or b. navigate a high speed vessel during sea time on the voyage of a commercial or training high speed vessel
5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. constructing a passage plan for a commercial high speed vessel a.2. organising bridge team and operations to fulfil high speed watchkeeping requirements a.3. ensuring compliance with relevant maritime regulations when operating at high speed a.4. initialising and operating electronic navigation systems typically used in high speed vessels a.5. operating radar and ARPA during a high speed passage a.6. using GPS, ECDIS and radar for high speed navigation a.7. interpreting and analysing data generated by electronic navigation systems and using it to inform navigational command decisions in conjunction with visual information a.8. applying information from visual observation and other electronic aids in appropriate combination a.9. assessing operational capability of various types of electronic navigational aids b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. International Code of Safety for the Operation of High Speed Craft b.2. relevant sections of IMO STCW 95 Code and AMSA Marine Orders b.3. ISM Code and associated vessel's Safety Management System and procedures b.4. OHS regulations and hazard prevention policies and procedures b.5. job procedures and work instructions b.6. relevant manufacturer's guidelines relating to the navigation of high speed vessels c. Action taken promptly to report and/or rectify problems in the navigation of a high speed vessel in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM ML1 01A ORGANISE AND MANAGE THE CREW

Field L Human Resources

DESCRIPTION:

This unit involves the skills and knowledge required to organise and manage the crew of a commercial vessel, including allocating duties, conduct of required training and assessment and maintenance of expected standards of work and behaviour on board a vessel.

The unit is consistent with the related functional standard in Sections A II/2 and A III/2 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 2.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Provide leadership to officers and crew</p>	<ul style="list-style-type: none"> a. Provides support for officers and crew in their day-to-day work b. Provides feedback to officers and crew on the achievements and performance c. Treats officers and crew fairly, equitably and honestly in matters related to their day-to-day work d. Resolves conflicts with and between officers and crew fairly, honestly and effectively using appropriate conflict resolution techniques e. Takes appropriate action to prevent harassment and deals with it promptly, effectively and fairly should there be any indication that it may have occurred f. Listens and acts on suggestions for work improvements made by officers and crew g. Shares credit for achievements with officers and crew h. Provides a good example of a responsible, fair, sympathetic, equitable and diligent member of the shipboard team
<p>2. Allocate duties</p>	<ul style="list-style-type: none"> a. Work requirements are identified and clarified b. Plans for vessel operations are drawn up c. Competencies of officers and crew are assessed and confirmed d. Duties are assigned to officers and crew in accordance with their competence and capabilities e. Officers and crew are advised of their rostered duties in accordance with company procedures
<p>3. Maintain standards of work and behaviour on board a vessel</p>	<ul style="list-style-type: none"> a. Performance standards for officers and crew are set in conjunction with officers and crew in accordance with company procedures b. Required performance standards are communicated effectively to the officers and crew c. Staff are motivated to achieve to set standards of work performance using appropriate methods d. Performance of the officers and crew is monitored as required using appropriate methods in accordance with company procedures e. Outcomes of performance assessment are discussed with relevant officers and crew and agreement is reached on appropriate action to be taken where performance is found to be below the set standards
<p>4. Resolve conflicts</p>	<ul style="list-style-type: none"> a. Conflict situations are recognised and the issues involved are clarified with the personnel involved b. Solutions to the conflicts are negotiated using appropriate mediation and conflict resolution techniques

<p>5. Plan, organise and promote shipboard training and assessment</p>	<ul style="list-style-type: none"> a. Competencies required for work are identified, attained and maintained b. Competency deficiencies in personnel are identified and remedial action is initiated through counselling and training c. Workplace trainer and assessor requirements are identified and appropriate staff are trained and assigned as required d. Training opportunities are planned and organised for officers and crew in accordance with identified needs and company policy e. Shipboard drills are organised as required by regulations and company procedures f. Assessment of officers and/or crew during and after training activities and shipboard drills is carried out to confirm that required competencies and related knowledge have been demonstrated g. Completions of all paperwork related to the conduct and outcomes of training, drills and assessment on board a vessel
<p>6. Evaluate shipboard training and assessment</p>	<ul style="list-style-type: none"> a. Officers and crew are debriefed after training, drill and assessment activities using appropriate methods b. The efficacy of training, drill and assessment activities is evaluated based on feedback from participating officers and crew and other relevant evidence c. The outcomes of evaluations of training and assessment are discussed with trainers and assessors and appropriate action is taken to make any required improvements d. Reports on training and assessment evaluated and any resultant action are maintained and/or entered into the vessel's log as required

Range Of Variables

ORGANISE AND MANAGE THE CREW

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of a significant range of fundamental human resource management principles across a wide and often unpredictable variety of operational contexts. Contribution to the development of a broad human resources plan and training strategy consistent with the operational needs of the vessel is required. Accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires significant judgement in planning, training and leadership functions related to human resource organisation and management
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel of 500 gross tonnage or more (in the case of masters), or 3,000kW propulsion power (in the case of engineers) b. Human resource management responsibilities may include: <ul style="list-style-type: none"> b.1. development of human resource management plans for the vessel b.2. establishment of performance standards for vessel operations b.3. establishment of competency standards for officers and crew on board a vessel b.4. evaluation of competence of officers and crew and the initiation of appropriate action to maintain competence b.5. allocation of duties to officers and crew b.6. motivation of shipboard personnel b.7. monitoring of performance of officers and crew b.8. organisation of required training, shipboard drills and assessment b.9. investigation and arbitration of shipboard conflicts b.10. implementation of equal employment policies c. Training may include: <ul style="list-style-type: none"> c.1. on-board group training activities c.2. on-board individual instruction c.3. shore-based training for shipboard personnel c.4. distance learning for shipboard personnel c.5. shipboard drills required by regulations or company policies
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. IMO STCW Convention and Code a.4. AMSA Marine Orders a.5. vessel's log a.6. company human resource procedures and policies a.7. relevant Australian Training Packages and competency standards a.8. industrial award requirements a.9. Australian Merchant Navy Code of Conduct a.10. equal employment policies and regulations a.11. relevant International Labor Conventions and measures a.12. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to vessels of 500 gross tonnage or more a.2. relevant sections of AMSA Marine Orders a.3. ISM Code Safety Management System a.4. relevant international, Australian and State/Territory OH&S legislation a.5. Australian equal employment legislation and related policies a.6. relevant International Labor Conventions and measures

Evidence Guide

ORGANISE AND MANAGE THE CREW

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Develop and implement a human resource management plan for a vessel a.2. Allocate duties to officers and crew a.3. Set and monitor human resource performance and competency requirements for vessel operations a.4. Motivate shipboard personnel a.5. Identify and resolve shipboard conflicts a.6. Organise and evaluate training, drills and assessment activities a.7. Identify typical human resource management problems and take appropriate action a.8. Communicate effectively with others as part of human resource management
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master on a commercial vessel of 500 gross tonnage or more, or a chief engineer officer or second engineer officer on a commercial vessel of 3,000kW propulsion power or more.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Equal employment policies and regulations d. ISM Code Safety Management System e. Relevant industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements f. Principles of vessel and bridge human resource management g. Methods for the motivation of shipboard personnel h. Principles of effective leadership and teamwork i. Competency requirements for typical shipboard operations j. Training and competency assessment techniques and options suitable for shipboard personnel k. Techniques for the setting of performance standards and the evaluation of performance of shipboard personnel l. Methods for evaluating the efficacy of shipboard training , drills and competency assessment m. Maritime communication techniques including barriers to effective communication and how to overcome them n. National Training Packages and competency standards relevant to shipboard personnel o. Conflict resolution and mediation strategies and techniques p. Regulatory requirements for shipboard drills q. Human resource management problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to effectively organise and manage the crew on board a commercial vessel of 500 gross tonnage or more (in the case of masters), or 3,000 kW propulsion power (in the case of engineers), and/or b. assist in organising and managing the crew on board an operational commercial vessel

Evidence Guide (continued)

ORGANISE AND MANAGE THE CREW

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out human resource management functions on board a vessel a.2 identifying and evaluating human resource management problems and determining appropriate courses of action a.3 identifying and implementing improvements to human resource management plans, policies and procedures a.4 applying equal employment and safety requirements when developing and implementing human resource management plans a.5 resolving shipboard conflicts a.6 assessing performance of shipboard personnel a.7 evaluating efficacy of training, drills and assessment activities <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 equal employment and OHS regulations policies and procedures b.4 issue resolution procedures b.5 job procedures and work instructions b.6 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations b.7 shipboard training, drill and assessment procedures <p>c. Action taken promptly to report and/or rectify human resource conflicts and problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDM ML2 01A **CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL**

Field L Human Resources

DESCRIPTION:

This unit involves the skills and knowledge required to contribute to effective human relationships onboard a commercial vessel, including performance of allocated duties and observation of expected standards of work and behaviour on board a vessel.

The unit is consistent with the related functional standard in Section A VI/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Contribute to the effective human relationships onboard a vessel</p>	<ul style="list-style-type: none"> a. Social responsibilities to other members of the crew onboard a vessel are fulfilled b. Contributes to the achievement of a harmonious working environment onboard a vessel c. Assists and encourages others in workplace activities d. Contributes to the solution of conflicts by participating in mediation and negotiations fairly, honestly and effectively e. Takes appropriate action to avoid and prevent harassment of others in the crew f. Maintains appropriate standards of hygiene and cleanliness required when living in an shipboard community g. Communicates with others effectively in the course of social and work activities h. Shares credit for achievements with others in the crew i. Provides a good example of a responsible, fair, sympathetic, equitable and diligent member of the shipboard team
<p>2. Observe standards of work and behaviour onboard a vessel</p>	<ul style="list-style-type: none"> a. Work is carried out individually and in association with others in accordance with established performance standards b. Feedback on assessed work performance is acknowledged, discussed and acted upon c. Personal skills and knowledge are developed through onboard training and other means to ensure an effective contribution to shipboard work activities d. Employment conditions are known, understood and followed e. Individual rights and responsibilities onboard a vessel are known, understood and fulfilled f. Drug and alcohol abuse are avoided as required by company and vessel's policy and procedures and regulatory requirements
<p>3. Resolve conflicts</p>	<ul style="list-style-type: none"> a. Conflict situations are recognised and appropriate assistance is sought to resolve the conflict with the personnel involved in accordance with vessel's procedures b. Contributes to action to solve conflicts by actively participating in appropriate mediation and conflict resolution procedures

Range Of Variables

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed as a member of a crew within defined work and social standards, with some responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of established standards to work and social behaviour on board a vessel. Contribution to the maintenance of good human and working relationships with others onboard a vessel is involved.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Work and social responsibilities may include: <ul style="list-style-type: none"> b.1. compliance with performance standards for workplace activities b.2. achievement of required competency standards for personal duties on board a vessel b.3. cooperative response to evaluations of competence by senior officers and the initiation of appropriate action to maintain competence b.4. effective and timely completion of assigned duties b.5. compliance with conditions of employment b.6. fulfilment of individual work and social obligations b.7. maintenance of required standards of hygiene and cleanliness b.8. monitoring of own work and social performance b.9. participation in assigned training, shipboard drills and assessment b.10. contribution to the resolution of shipboard conflicts b.11. implementation of anti-discrimination and harassment policies b.12. avoidance of drug and alcohol abuse c. Opportunities to develop personal work competence may include: <ul style="list-style-type: none"> c.1. on-board group training activities c.2. on-board individual instruction c.3. shore-based training for shipboard personnel c.4. distance learning for shipboard personnel c.5. shipboard drills required by regulations or company policies

Range Of Variables (continued)

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. company human resource procedures and policies a.3. safety management system plans, procedures, checklists and instructions (where applicable) a.4. relevant Australian Training Packages and competency standards a.5. industrial award requirements a.6. equal employment policies and regulations a.7. relevant International Labor Conventions and measures a.8. instructions of relevant Maritime Authorities
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. the Australian USL Code a.2. relevant sections of AMSA Marine Orders a.3. IMO STCW 95 Code and Convention a.4. relevant international, Australian and State/Territory OH&S legislation a.5. ISM Code (where applicable) a.6. Australian equal employment legislation and related policies a.7. relevant International Labor Conventions and measures

Evidence Guide

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Contribute to a harmonious work and social environment onboard a vessel a.2. Carry out assigned duties to established standards a.3. Achieve and maintain workplace competency requirements a.4. Contribute to the resolution of shipboard conflicts a.5. Participate in assigned training, drills and assessment activities a.6. Maintain required standards of hygiene and cleanliness a.7. Identify typical work and social problems and take appropriate action a.8. Communicate effectively with others as part of onboard work and social activities
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of IMO STCW Convention and Codes and AMSA Marine Orders dealing with human relationships onboard a vessel b. ISM Code and associated ship's safety management system and procedures (where applicable) c. Relevant OH&S legislation, codes of practice, policies and procedures d. Anti-discrimination and harassment policies and regulations e. Relevant industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements f. Typical company and vessel's instructions and procedures for social behaviour and shipboard work and emergency situations g. Principles of effective social interaction and teamwork onboard a vessel h. Appropriate standards of hygiene and cleanliness required when living in an onboard community i. Maritime communication techniques including barriers to effective communication and how to overcome them j. Conflict resolution and mediation strategies and techniques used onboard a vessels k. Regulatory requirements for shipboard drills l. Human resource relationship problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to contribute to an effective harmonious work and social environment onboard a vessel, and/or b. contribute to an effective harmonious work and social environment on board an operational commercial vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 contributing to a harmonious work and social environment onboard a vessel a.2 carrying out work duties onboard a vessel a.3 identifying and evaluating human relationship problems and determining appropriate courses of action a.4 applying anti-discrimination, harassment, hygiene, and safety requirements when interacting with others in work and social activities a.5 contributing to the resolution of shipboard conflicts b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 vessel's safety management system and procedures b.3 anti-discrimination, harassment and OHS regulations policies and procedures b.4 job procedures and work instructions b.5 shipboard training, drill and assessment procedures c. Action taken promptly to report and/or rectify conflicts and human relationship problems in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

CONTRIBUTE TO EFFECTIVE HUMAN RELATIONSHIPS ON BOARD A VESSEL

6. Context for assessment	<ul style="list-style-type: none">a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulationsb. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:<ul style="list-style-type: none">b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinationsb.2. Appropriate practical assessment must occur:<ul style="list-style-type: none">b.2.1. at the registered training organisation, and/orb.2.2. on an appropriate working or training vessel
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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	2	1	2	1	1	1

TDM ML3 01A ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

Field L Human Resources

DESCRIPTION:

This unit involves the skills and knowledge required to establish and maintain a harmonious workplace environment on board a commercial vessel, including providing leadership to the crew, informing crew of expected standards of work and behaviour, allocating appropriate duties to crew, training and assessment of crew members, and identifying and dealing with conflict.

The unit is consistent with the relevant functional standard in the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Provide leadership to crew	<ul style="list-style-type: none"> a. Provides support for members of crew in their day-to-day work b. Provides feedback to members of crew on the achievements and performance c. Treats members of crew fairly, equitably and honestly in matters related to their day-to-day work d. Resolves conflicts with and between officers and crew fairly, honestly and effectively using e. Takes appropriate action to prevent harassment and deals with it promptly, effectively and fairly should there be any indication that it may have occurred f. Listens and acts on suggestions for work improvements made by crew members g. Shares credit for achievements with crew h. Provides a good example of a responsible, fair, sympathetic, equitable and diligent member of the shipboard team
2. Allocate duties	<ul style="list-style-type: none"> a. Work requirements are identified and clarified b. Competencies of crew members are assessed and confirmed c. Duties are assigned to crew in accordance with their competence and capabilities d. Crew members are advised of their rostered duties in accordance with company procedures
3. Maintain standards of work and behaviour on board vessel	<ul style="list-style-type: none"> a. Performance standards for crewmembers are identified and interpreted in accordance with company procedures b. Required performance standards are communicated effectively to the crew c. Staff are motivated to achieve to set standards of work performance using appropriate methods d. Performance of the crew is monitored as required using appropriate methods in accordance with company procedures e. Outcomes of performance assessment are discussed with individual crew members and agreement is reached on appropriate action to be taken where performance is found to be below the set standards
4. Resolve conflicts	<ul style="list-style-type: none"> a. Conflict situations are recognised and the issues involved are clarified with the personnel involved b. Solutions to the conflicts are negotiated using appropriate mediation and conflict resolution techniques c. Records of shipboard conflicts and the outcomes of mediation are maintained in accordance with company procedures and established mediation practices

<p>5. Organise onboard training and assessment for crew</p>	<ul style="list-style-type: none"> a. Competencies required for work are identified and interpreted b. Competency deficiencies in crew members are identified and remedial action is initiated through counselling and training c. Workplace training needs are identified using appropriate assessment methods d. Training opportunities are organised for crew members in accordance with identified needs and company policy e. Shipboard drills are organised as required by regulations and company procedures f. Assessment of crew during and after training activities and shipboard drills is carried out to confirm that required competencies and related knowledge have been demonstrated g. Paperwork related to the conduct and outcomes of training, drills and assessment on board vessel is completed and securely filed in accordance with company procedures
<p>6. Evaluate onboard training and assessment</p>	<ul style="list-style-type: none"> a. Crew members are debriefed after training, drill and assessment activities using appropriate methods b. The efficacy of training, drill and assessment activities is evaluated based on feedback from participating crew and other relevant evidence c. The outcomes of evaluations of training and assessment are discussed with trainers and assessors and appropriate action is taken to make any required improvements d. Reports on training and assessment are evaluated, and any resultant action, are maintained and/or entered into the vessel's log as required

Range Of Variables

ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in achieving the specified quality and quantity of outcomes. It involves routine procedures necessary to establish and maintain a harmonious workplace environment onboard vessel and the achievement of solutions to a defined range of leadership and human resource management situations. c. Some discretion and judgement is required in anticipating and allowing for possible human resource problems and contingencies and the actions to be taken in these eventualities.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel metres in length engaged on coastal voyages b. Human resource management responsibilities may include: <ul style="list-style-type: none"> b.1. implementation of human resource management plans for the vessel b.2. implementation of performance standards for vessel operations b.3. application of competency standards for crew on board vessel b.4. evaluation of competence of crew members and the organisation of appropriate action to maintain competence b.5. allocation of duties to crew b.6. motivation of crew b.7. monitoring of performance of crew b.8. organisation of required training, shipboard drills and assessment b.9. investigation and mediation of shipboard conflicts b.10. implementation of equal employment policies c. Training may include: <ul style="list-style-type: none"> c.1. on-board group training activities c.2. on-board individual instruction c.3. shore-based training for shipboard personnel c.4. distance learning for shipboard personnel c.5. shipboard drills required by regulations or company policies
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. vessel's log a.3. human resource procedures and policies a.4. relevant Australian Training Packages and competency standards a.5. industrial award requirements a.6. Australian Merchant Navy Code of Conduct a.7. equal employment policies and regulations a.8. relevant International Labor Conventions and measures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code a.2. relevant Australian and State/Territory OH&S legislation a.3. Australian equal employment legislation and related policies a.4. relevant International Labor Conventions and measures

Evidence Guide

ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement a human resource management plan for a small commercial vessel a.2. Allocate duties to crew a.3. Monitor human resource performance and competency requirements for vessel operations a.4. Motivate crew a.5. Identify and resolve shipboard conflicts amongst crew a.6. Organise and evaluate training, drills and assessment activities a.7. Identify typical human resource management problems and take appropriate action a.8. Communicate effectively with others as part of human resource management
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the master of a small commercial vessel engaged in coastal voyages.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime and human resources regulations b. Relevant OH&S legislation and policies c. Equal employment policies and regulations d. Relevant industrial award requirements as they relate to shipboard personnel responsibilities, obligations and entitlements e. Principles of vessel and bridge human resource management f. Methods for the motivation of shipboard personnel g. Principles of effective leadership and teamwork h. Competency requirements for typical shipboard operations i. Training and competency assessment techniques and options suitable for shipboard personnel j. Techniques for interpreting performance standards and evaluating the performance crew k. Methods for evaluating the efficacy of shipboard training, drills and competency assessment l. Maritime communication techniques including barriers to effective communication and how to overcome them m. National Training Packages and competency standards relevant to shipboard personnel n. Conflict resolution and mediation strategies and techniques o. Regulatory requirements for shipboard drills p. Human resource management problems and appropriate action and solutions
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably-simulated human resource management activities, case studies and exercises covering a range of situations that are typically experienced a small vessel engaged on a coastal voyage; and/or b. contribute to human resource management activities on in an appropriate range of operational situations on a small commercial or training vessel engaged on a coastal voyage.

Evidence Guide (continued)

ESTABLISH AND MAINTAIN A HARMONIOUS WORKPLACE ENVIRONMENT

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out human resource management functions on board a small vessel a.2 identifying and evaluating human resource management problems and determining appropriate courses of action a.3 identifying and implementing improvements to human resource management plans, policies and procedures a.4 applying equal employment and safety requirements when developing and implementing human resource management plans a.5 resolving shipboard conflicts a.6 assessing performance of shipboard personnel a.7 evaluating efficacy of training, drills and assessment activities <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant regulations b.2 equal employment and OHS regulations policies and procedures b.3 issue resolution procedures b.4 job procedures and work instructions b.5 shipboard training, drill and assessment procedures <p>c. Action taken promptly to report and/or rectify human resource conflicts and management problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	1	1	1

TDM MR1 01A OPERATE AND MAINTAIN STEERING GEAR ARRANGEMENTS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and maintain steering gear arrangements on a small commercial vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Master (Class 5).

ELEMENT	PERFORMANCE CRITERIA
1. Operate steering gear arrangements	<ul style="list-style-type: none">a. Steering gear is operated in accordance with manufacturer's instructionsb. Problems encountered in the use of steering gear arrangements on the vessel are reported and/or rectified in accordance with established procedures
2. Maintain steering gear arrangements	<ul style="list-style-type: none">a. Maintenance program for the steering gear arrangements on the vessel is prepared which fulfils all survey requirementsb. Checks of the vessel's steering gear are carried out in accordance with planned maintenance procedures and manufacturer's instructionsc. Any operational problems or faults with the vessel's steering gear are identified and appropriate maintenance action initiatedd. Lubricants are applied to moving parts of steering gear in accordance with manufacturer's instructionse. Faulty steering gear equipment and parts are identified, reported and repaired or replaced in accordance with manufacturer's instructions and established proceduresf. Required adjustments to the steering gear arrangements are carried out in accordance with manufacturer's specificationsg. Records of maintenance work carried out are completed in accordance with planned procedures

Range Of Variables

OPERATE AND MAINTAIN STEERING GEAR ARRANGEMENTS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within defined operational procedures, with responsibility for own outputs and limited responsibility for others in achieving the operation and maintenance of the steering gear arrangements for a small vessel. Preparing and implementing a planned steering gear maintenance program for a vessel up to 24 metres in length is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 24 metres in length b. Operation of the steering gear arrangements may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. when berthed or moored b.3. when slipped or in dry dock c. Maintenance may include: <ul style="list-style-type: none"> c.1. routine maintenance inspections c.2. identification of any faults or operational problems c.3. repairs of minor faults and imperfections in painted surfaces c.4. identification of faulty equipment or fittings and arranging for repair or replacement c.5. application of lubricants to moving parts of steering gear d. Maintenance tools and equipment may include: <ul style="list-style-type: none"> d.1. hand tools d.2. greasing and lubrication tools d.3. protective clothing and equipment such as: <ul style="list-style-type: none"> d.3.1. eye and ear protection d.3.2. safety boots d.3.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. planned maintenance procedures a.2. maintenance schedules and records a.3. steering gear manufacturer's instructions, specifications and recommended procedures a.4. instructions of relevant Maritime Authorities related to the maintenance of vessels
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. the Australian USL Code a.2. relevant Australian and State/Territory OH&S legislation

Evidence Guide

OPERATE AND MAINTAIN STEERING GEAR ARRANGEMENTS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate and maintain steering gear arrangements on a small vessel a.2. Identify problems related to the steering gear operation and maintenance and take appropriate action a.3. Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations a.4. Communicate effectively with others when operating and maintaining steering gear arrangements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of master of a small commercial vessel up to 24 metres in length.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant maritime qualifications b. Relevant OH&S legislation and policies c. Principle design and safety features and component parts of steering gear arrangements used on small vessels d. Procedures for operating typical steering gear arrangements found on small vessels e. Procedures for the checking and inspecting of steering gear arrangements as part of routine maintenance procedures f. Basic component parts, operation and survey requirements of steering gear arrangements on a small vessel g. Repair and/or replacement procedures for steering gear arrangements and related components onboard small vessels h. Procedures for using hand tools for typical maintenance operations in steering gear arrangements on small vessels i. Requirements for, and operation of, emergency steering systems j. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance of steering gear arrangements on small vessels k. Maritime communication techniques needed during slipping and maintenance operations l. Problems that may be experienced related to the operation and maintenance of steering gear arrangements and appropriate action and solutions m. Maintenance records that must be maintained on a small vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out maintenance on steering gear arrangements on a small vessel, and/or b. operate and carry out maintenance on steering gear on an operational commercial or training small vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 carrying out routine maintenance checks on steering gear arrangements on a small vessel a.2 identifying and evaluating maintenance problems and determining appropriate courses of action a.3 initiating and coordinating steering gear maintenance activities on a small vessel a.4 applying safety precautions relevant to maintenance operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant steering gear manufacturer's guidelines relating to routine maintenance procedures b.5 environmental protection procedures when carrying out maintenance operations c. Action taken promptly to report and/or rectify defective steering gear equipment and components in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

OPERATE AND MAINTAIN STEERING GEAR ARRANGEMENTS

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	2	2	1	2	2

TDM MR02 01A USE AND MAINTAIN DECK EQUIPMENT AND MACHINERY

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to organise the use and maintenance of deck machinery installed on a small commercial vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 1).

ELEMENT	PERFORMANCE CRITERIA
1. Ensure safe operation of deck machinery	<ul style="list-style-type: none"> a. Operation of deck machinery is monitored to ensure compliance with manufacturer's specifications and instructions and safety requirements b. Any operational problems encountered in the use of deck machinery on the vessel are reported and/or rectified in accordance with procedures c. Malfunctioning equipment is identified and the nature of the fault is investigated and the outcomes reported in accordance with procedures
2. Coordinate maintenance of deck machinery	<ul style="list-style-type: none"> a. Maintenance arrangements for deck machinery on the vessel are organised to fulfil survey requirements and manufacturer's specifications b. Operational problems or faults with the vessel's deck machinery are identified and the causes identified c. Identified faulty deck machinery, equipment and parts are reported as required and appropriate maintenance or replacement action initiated d. Any restrictions to operations arising from identified malfunctions of the deck machinery are justified and reported as required e. Arrangements are made to carry out routine lubrication and other preventative maintenance of deck machinery in accordance with manufacturer's instructions f. Faulty deck machinery, equipment and parts are identified, reported and repaired or replaced in accordance with manufacturer's instructions and procedures g. Required adjustments to the deck machinery are carried out in accordance with manufacturer's specifications h. Records of all preventative and remedial maintenance carried out on deck machinery are completed in accordance with procedures
3. Ensure that safety and hazard control procedures are applied	<ul style="list-style-type: none"> a. Operation and routine maintenance of deck machinery are monitored to ensure compliance with safety regulations b. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times c. Operational and maintenance hazards related to deck machinery use and maintenance are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment d. Action is taken in the event of failure or emergency to ensure the isolation and security of the deck machinery and maintain the safety of the vessel and personnel involved e. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving deck machinery

Range Of Variables

USE AND MAINTAIN DECK MACHINERY INSTALLED ON A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within broad operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality and quantity of outcomes. It involves the organisation of the use and basic maintenance of deck machinery on a vessel and the application of solutions to a defined range of maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 750 kW propulsion power (and up to 1,500 kW in restricted offshore operations) b. Operation and maintenance of the deck machinery may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any permissible conditions of weather b.3. while underway b.4. when berthed or moored b.5. when slipped or in dry dock c. Maintenance may include: <ul style="list-style-type: none"> c.1. routine visual and performance checks c.2. identification of any faults or operational problems c.3. identification of damaged or worn equipment or fittings and arranging for repair or replacement c.4. application of lubricants to moving parts of deck machinery d. Deck machinery may include but is not limited to: <ul style="list-style-type: none"> d.1. winches d.2. windlass d.3. safeguards and protective devices for winches e. Maintenance tools and equipment may include: <ul style="list-style-type: none"> e.1. hand tools e.2. greasing and lubrication tools e.3. protective clothing and equipment such as: <ul style="list-style-type: none"> e.3.1. eye and ear protection e.3.2. safety boots and helmet e.3.3. dust and fume masks f. Operational, maintenance and repair hazards may include: <ul style="list-style-type: none"> f.1. moving heavy loads using unsafe lifting procedures f.2. unsecured machinery, components or repair equipment f.3. slippery deck f.4. sharp tools and implements f.5. power tools f.6. moving and rotating machinery f.7. faulty machinery equipment handling equipment and lifting gear f.8. using equipment beyond safe working limits f.9. poor housekeeping procedures f.10. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. maintenance and repair procedures and instructions a.2. sections of the Australian USL Code dealing with small vessel maintenance a.3. company and vessel operational and maintenance procedures for deck machinery a.4. maintenance records a.5. deck machinery manufacturer's instructions, specifications and recommended procedures a.6. instructions of relevant Maritime Authorities related to the maintenance of vessels a.7. relevant Australian standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with small vessel maintenance a.2. relevant Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

USE AND MAINTAIN DECK MACHINERY INSTALLED ON A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Organise and coordinate the use and maintenance of deck machinery on a small commercial vessel a.2. Identify problems related to the deck machinery operation and maintenance and take appropriate action in conjunction with other vessel personnel a.3. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures when operating deck machinery a.4. Communicate effectively with others when coordinating the operation and maintenance of deck machinery
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 1).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant maritime regulations b. Relevant OH&S and pollution control legislation and policies c. Principle operational and safety features and component parts of deck machinery used on small vessels d. Component parts, operation and routine maintenance requirements of deck machinery and anchor equipment on a small vessel e. Procedures for organising the operation and routine maintenance of deck machinery found on small vessels falling within the limits of responsibility of a Marine Engine Driver (Grade 1) f. Procedures for checking deck machinery g. Repair and/or replacement procedures for deck machinery and components onboard small vessels h. Knowledge and ability to read and interpret ship and machinery operational manuals and specifications. i. Basic principles of mechanics as they relate to forces, pressures, stress and strains involved in the use of deck machinery installed on small vessels j. Principles and procedures of machinery lubrication as they relate to deck machinery on a small vessel k. Procedures for using hand tools for basic maintenance operations on deck machinery on small vessels l. Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions m. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine maintenance of deck machinery on small vessels n. Safe procedures for handling heavy items during routine maintenance of deck machinery o. Knowledge and ability to read and interpret material safety data sheets p. Maritime communication techniques needed during the use and maintenance of deck machinery on a small vessel q. Maintenance records that must be maintained on a small commercial vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to coordinate the use and routine maintenance of deck machinery on a small vessel, and/or b. coordinate the use and routine maintenance of deck machinery on an operational small commercial or training vessel

Evidence Guide (continued)

USE AND MAINTAIN DECK MACHINERY INSTALLED ON A VESSEL

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 coordinating the use and routine maintenance of deck machinery on a small vessel a.2 identifying and investigating operational and maintenance problems and determining appropriate courses of action a.3 ensuring the application of safety precautions relevant to use and maintenance of deck machinery a.4 identifying and implementing improvements to routine maintenance procedures b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of the Australian USL Code b.2 OHS regulations, pollution control and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant deck machinery manufacturer's guidelines relating to operation routine maintenance procedures b.5 environmental protection procedures when carrying out maintenance operations c. Action taken promptly to report and/or rectify defective or malfunctioning deck machinery in accordance with manufacturer's instructions d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2	2

TDM MR3 01A OPERATE FUEL, FRESH AND BALLAST WATER, BILGE AND FIRE PUMPING SYSTEMS INSTALLED IN A VESSEL

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate fuel, fresh and ballast water, bilge and fire pumping systems installed in a small commercial vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Master (Class 5).

ELEMENT	PERFORMANCE CRITERIA
1. Operate pumping equipment	<ul style="list-style-type: none"> a. Pumping arrangements are operated in accordance with manufacturer's specification b. Any operational problems encountered in the use of pumping arrangements on the vessel are reported and/or rectified in accordance with established procedures
2. Maintain pumping equipment	<ul style="list-style-type: none"> a. A planned maintenance program for pumping systems on the vessel is prepared which fulfils all survey requirements b. Checks of the vessel's pumping arrangements are carried out in accordance with planned maintenance program and manufacturer's instructions c. Any operational problems or faults with the vessel's pumping arrangements are identified and appropriate maintenance action initiated d. Lubricants are applied to moving parts of pumps and related equipment within pumping arrangements in accordance with manufacturer's instructions e. Faulty pumps, related equipment and parts are identified, reported and repaired or replaced in accordance with manufacturer's instructions f. Required adjustments to the pumping arrangements are carried out in accordance with manufacturer's specifications g. Records of maintenance work carried out are completed in accordance with established procedures

Range Of Variables

OPERATE FUEL, FRESH AND BALLAST WATER, BILGE AND FIRE PUMPING SYSTEMS INSTALLED IN A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within defined operational procedures, with responsibility for own outputs and limited responsibility for others in achieving the operation and maintenance of the pumping arrangements for a small vessel. Preparing and implementing a planned maintenance program for pumping arrangements on a vessel up to 24 metres in length is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 24 metres in length b. Operation and maintenance of the pumping arrangements may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. when berthed or moored b.3. when slipped or in dry dock c. Pumping systems may include: <ul style="list-style-type: none"> c.1. fire systems c.2. bilge systems c.3. ballast systems c.4. fuel systems c.5. fresh water systems d. Tank operations may include: <ul style="list-style-type: none"> d.1. sounding d.2. filling d.3. pumping d.4. venting e. Maintenance may include: <ul style="list-style-type: none"> e.1. routine maintenance inspections e.2. identification of any faults or operational problems e.3. identification of faulty equipment or fittings and arranging for repair or replacement e.4. application of lubricants to moving parts of pumps and related equipment within a vessel's pumping arrangements f. Maintenance tools and equipment may include: <ul style="list-style-type: none"> f.1. hand tools f.2. greasing and lubrication tools f.3. protective clothing and equipment such as: <ul style="list-style-type: none"> f.3.1. eye and ear protection f.3.2. safety boots f.3.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. planned maintenance procedures a.3. maintenance schedules and records a.4. manufacturer's instructions, specifications and recommended procedures a.5. instructions of relevant Maritime Authorities related to the maintenance of vessels
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. the Australian USL Code a.2. relevant Australian and State/Territory OH&S legislation

Evidence Guide

OPERATE FUEL, FRESH AND BALLAST WATER, BILGE AND FIRE PUMPING SYSTEMS INSTALLED IN A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate and maintain pumping arrangements on a small vessel a.2. Identify problems related to the operation and maintenance of pumping arrangements and take appropriate action a.3. Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations a.4. Communicate effectively with others when operating and maintaining pumping arrangements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of master of a small commercial vessel up to 24 metres in length.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Principle operational and safety features and component parts of pumping arrangements used on small vessels d. Purpose and specific operational features and issues for the various pumping functions involved in the pumping arrangements on a small vessel, including: <ul style="list-style-type: none"> d.1. pumping of fuel d.2. pumping of fresh and ballast water d.3. bilge pumping, including emergency systems d.4. fire water pumping e. Ability to identify pumping systems on vessel drawings and identify and locate and trace them onboard the vessel f. Basic component parts, operation and survey requirements of pumping arrangements on a typical small vessel g. Colour coding used to identify pumping systems on a small vessel h. Procedures for operating typical pumping arrangements found on small vessels i. Problems that may be experienced concerning the operation and maintenance of pumping arrangements on small vessels and appropriate precautions, action and solutions j. Safety, operational, environmental and hygiene issues, precautions and procedures for: <ul style="list-style-type: none"> j.1. avoidance of contamination of fuel or drinking water j.2. keeping bilges clean j.3. maintaining an adequate supply of water for fire fighting during emergencies whilst maintaining the stability of the vessel j.4. avoidance of contamination of the marine environment k. Procedures for the checking, testing and inspecting pumping arrangements as part of a planned routine maintenance program l. Repair and/or replacement procedures for pumping arrangements onboard small vessels m. Procedures for using hand tools for typical maintenance operations on pumping arrangements on small vessels n. Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance of pumping arrangements on small vessels o. Maintenance records that must be maintained on a small vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out operations and maintenance on pumping arrangements on a small vessel, and/or b. operate and carry out maintenance on pumping arrangements on an operational commercial or training small vessel

Evidence Guide (continued)

OPERATE FUEL, FRESH AND BALLAST WATER, BILGE AND FIRE PUMPING SYSTEMS INSTALLED IN A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 carrying out planned routine maintenance tests and checks of pumping arrangements on a small vessel a.2 identifying and evaluating maintenance problems and determining appropriate courses of action a.3 initiating and coordinating maintenance activities for pumping arrangements on a small vessel a.4 applying safety precautions relevant to the operation and maintenance of pumping arrangements on a small vessel <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 manufacturer's guidelines relating to operational and routine maintenance procedures for pumping arrangements b.5 environmental protection procedures when operating and maintaining pumping arrangements <p>c. Action is taken promptly to report and/or rectify defective pumping arrangements, equipment and components</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2	2

TDM MR30 01A OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out routine basic servicing checks within the limits of responsibility and skill of a Marine Engine Driver (Grade 3) on propulsion systems on a small commercial vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
1. Operate propulsion systems	<ul style="list-style-type: none"> a. Propulsion system is operated in accordance with procedures and manufacturer's instructions and specifications b. Propulsion system is prepared, started, and shut down in accordance with manufacturers' instructions
2. Carry out basic, routine servicing procedures on propulsion systems	<ul style="list-style-type: none"> a. The operation of propulsion systems is monitored in accordance manufacturer's instructions and faulty operation reported or rectified in accordance with procedures b. Basic user service checks are carried out on propulsion system before and during operation in accordance with manufacturer's instructions and within the limits of responsibility and skill of a Marine Engine Driver (Grade 3) c. Faulty machinery and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with company procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. All required safety precaution and regulations are followed when operating and maintaining propulsion systems b. Appropriate action is taken in the event of a failure or emergency involving propulsion systems to isolate and secure the relevant equipment and the vessel and maintain the safety of the vessel and persons involved c. Emergency and contingency plans are followed in the event of a failure or emergency involving propulsion systems

Range Of Variables

OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable maintenance problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel between 75kW and 150 kW propulsion power b. Propulsion systems may include: <ul style="list-style-type: none"> b.1. petrol and LPG outboard motors b.2. petrol inboard engines b.3. medium and high speed diesel propulsion equipment b.4. reduction gears, gearboxes, V-drive boxes, drive legs, etc. b.5. thrust blocks and shaft bearings c. Operation and basic user servicing of propulsion systems may be conducted: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather c.3. while underway c.4. during berthing and unberthing operations c.5. while anchored or moored c.6. when bunkering c.7. during cargo operations d. Basic user service checks may include: <ul style="list-style-type: none"> d.1. carrying out manufacturer's instructions for prestart checks d.2. checking shaft glands d.3. checking strainers d.4. checking cooling system d.5. visual check for oil leaks d.6. visual check, identification and reporting of obvious equipment faults
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with the operation of small vessels a.2. equipment manufacturer's instructions, specifications and procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code related to the operation of small vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate propulsion systems on a small vessel a.2. Carry out routine basic service checks of propulsion systems on a small vessel a.3. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine user servicing of propulsion systems a.4. Communicate effectively with others when operating and carrying out basic service checks on propulsion systems on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Procedures for the operation and routine basic servicing of propulsion systems on a small vessel to ensure compliance safety and pollution control rules and regulations b. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine servicing of propulsion systems on a small vessel c. Basic features and operating characteristics of propulsion systems used on small vessels d. Problems related to the operation and routine basic servicing of propulsion systems on small vessels and appropriate action and solutions e. Operational and user maintenance records that must be maintained on a small commercial vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out routine basic service checks on propulsion systems on a small vessel, and/or b. operate and carry out routine basic service checks on propulsion systems on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating propulsion systems on a small vessel a.2 carrying out basic routine servicing within the limits of responsibility and skill of a Marine Engine Driver (Grade 3) on propulsion systems on a small vessel a.3 applying safety and pollution control precautions when operating propulsion systems on a small vessel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant equipment manufacturer's guidelines relating to operating and carrying out routine service checks on engines and propulsion systems b.5 environmental protection procedures when carrying out servicing operations c. Action is taken promptly to report problems identified with operating and carrying out routine basic service checks on propulsion systems d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

OPERATE AND CARRY OUT BASIC SERVICE CHECKS ON SMALL VESSEL MARINE PROPULSION SYSTEMS

6. Context for assessment	<ul style="list-style-type: none">a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulationsb. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:<ul style="list-style-type: none">b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinationsb.2. Appropriate practical assessment must occur:<ul style="list-style-type: none">b.2.1. at the registered training organisation, and/orb.2.2. on an appropriate working or training vessel
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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

TDM MR31 01A OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate and carry out routine basic servicing checks on auxiliary systems on a small commercial vessel, including the steering, pumping and any refrigeration systems on the vessel.

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
1. Operate auxiliary systems	<ul style="list-style-type: none"> a. Auxiliary systems are operated in accordance with procedures and manufacturer's instructions and specifications b. Auxiliary systems are prepared, started, and shut down in accordance with manufacturers' instructions
2. Carry out basic, routine checking and servicing procedures on auxiliary systems	<ul style="list-style-type: none"> a. The operation of auxiliary systems is monitored in accordance manufacturer's instructions and faulty operation reported in accordance with procedures b. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with company procedures
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. All required safety precaution and regulations are followed when operating and maintaining auxiliary systems b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, ship and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Appropriate action is taken in the event of a failure or emergency involving auxiliary systems to isolate and secure the relevant equipment and the ship and maintain the safety of the ship and persons involved e. Shipboard emergency and contingency plans followed in the event of a failure or emergency involving auxiliary systems

Range Of Variables

OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small trading vessels. b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable servicing problems.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small trading vessel between 75kW and 150 kW propulsion power b. Auxiliary systems may include: <ul style="list-style-type: none"> b.1. steering arrangements b.2. pumping systems b.3. refrigeration systems c. Operation and basic servicing of auxiliary systems may be conducted: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather c.3. while underway c.4. during berthing and unberthing operations c.5. while anchored or moored c.6. in dry dock c.7. when bunkering c.8. during cargo operations d. Basic servicing may include: <ul style="list-style-type: none"> d.1. routine basic checks of systems and equipment d.2. identification and reporting of faults and arranging for repair or replacement e. Operation and basic servicing tasks in extra low voltage systems (up to 32 volts) may include: <ul style="list-style-type: none"> e.1. operating controls e.2. checking readings e.3. identifying faulty operation e.4. making adjustments in accordance with manufacturer's instruction f. Servicing tools and equipment may include: <ul style="list-style-type: none"> f.1. hand tools including screwdrivers, spanners, wrenches f.2. protective clothing and equipment such as: <ul style="list-style-type: none"> f.2.1. eye and ear protection f.2.2. safety boots f.2.3. dust and fume masks
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with small vessels a.2. vessel and company auxiliary systems servicing procedures a.3. equipment manufacturer's instructions, specifications and procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. Australian USL Code related to the seaworthiness of vessels a.2. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate auxiliary systems on a small vessel a.2. Carry out routine basic servicing and checks of auxiliary systems on a small vessel a.3. Identify typical problems related to the basic servicing of a vessel and take appropriate action in conjunction with crew a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operation and routine servicing of systems a.5. Communicate effectively with others when operating and carrying out basic servicing on auxiliary systems on a small vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation, codes of practice, policies and procedures b. Procedures for the operation and routine basic servicing of auxiliary systems on a small vessel c. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine servicing of auxiliary systems on a small vessel d. Basic features and operating characteristics of auxiliary systems used on small vessels including: <ul style="list-style-type: none"> d.1. steering systems d.2. pumping systems d.3. refrigeration systems e. Problems related to the operation and routine basic servicing of auxiliary systems on small vessels and appropriate action and solutions f. Running logs and servicing records that may be kept on a small commercial vessel
<p>4. Resource implications</p>	<p>Access is required to opportunities to</p> <ul style="list-style-type: none"> a. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out routine basic servicing on auxiliary systems on a small vessel, and/or b. operate and carry out routine basic servicing on auxiliary systems on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 operating auxiliary systems on a small vessel a.2 carrying out routine servicing on auxiliary systems on a small vessel a.3 identifying and reporting routine operational and basic servicing problems a.4 applying safety and pollution control precautions when operating auxiliary systems on a small vessel b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of Australian USL Code b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant equipment manufacturer's guidelines relating to operating and carrying out routine servicing on auxiliary systems on a small vessel b.5 environmental protection procedures when carrying out servicing operations c. Action is taken promptly to report and/or rectify problems identified when operating and carrying out routine basic servicing on auxiliary systems d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

OPERATE AND CARRY OUT BASIC SERVICING ON AUXILIARY SYSTEMS

6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel
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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

TDM MR32 01A OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW AND LOW VOLTAGE ELECTRICAL SYSTEMS

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to safely operate and carry out routine basic servicing of extra low voltage and low voltage electrical systems and be aware of the safety precautions when using 50 volt systems used on a small commercial vessel, including operation and service checks of systems, basic care and servicing of batteries and charging systems and basic operation and servicing of starter motors, alternators and associated equipment.

Note: All installation, servicing and repair of AC (50 volts or above) or DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, servicing and repair of electrical circuits and systems at such voltages on a vessel

The unit is consistent with the section in the Australian USL Code dealing with the competency requirements of a Marine Engine Driver (Grade 3).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate extra low voltage electrical systems</p>	<ul style="list-style-type: none"> a. Extra low voltage (ELV) electrical systems are safely operated in accordance with procedures and manufacturer's instructions and specifications and within the limits of responsibility of a Marine Engine Driver (Grade 3) b. Appropriate precautions are taken when operating 50Volt electrical systems in accordance with established company procedures c. Basic servicing of extra low and low voltage systems is carried out in accordance with vessel's procedures within the limits of responsibility and skill of a Marine Engine Driver (Grade 3)
<p>2. Operate and carry out basic servicing of starter motors, alternators and associated equipment</p>	<ul style="list-style-type: none"> a. The operation of starter motors, alternators and associated equipment is monitored in accordance manufacturer's instructions b. Faulty equipment and components are identified and are reported and action is initiated as required for isolation, tagging and repair or replacement in accordance with the limits of responsibility and skill of a Marine Engine Driver (Grade 3)
<p>3. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precaution and regulations are followed when operating and servicing extra low voltage and low voltage electrical systems and associated equipment b. Operational hazards are identified and action is taken to minimise or eliminate risk to personnel, ship and the environment c. Where relevant and in consultation with relevant officers, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Appropriate action is taken in the event of a failure or emergency involving starter motors, alternators and extra low voltage electrical systems to isolate and secure the relevant equipment and the ship and maintain the safety of the ship and persons involved e. Shipboard emergency and contingency plans followed in the event of a failure or emergency involving starter motors, alternators and extra low voltage electrical systems

Range Of Variables

OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW VOLTAGE AND LOW VOLTAGE ELECTRICAL SYSTEMS

VARIABLE	SCOPE
1. General context	<p>a. Work must be carried out in compliance with the relevant sections of the Australian Uniform Shipping Laws (USL) Code applicable to small commercial vessels.</p> <p>b. Work is performed within established procedures, with responsibility for own outputs in relation to specified quality and safety standards. Limited responsibility for others in achieving outcomes is required including the application of solutions to a variety of predictable servicing problems falling within the limits of responsibility of a Marine Engine Driver (Grade 3).</p> <p>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel</p>
2. Worksite environment	<p>a. ELV systems may include those typically found on a small commercial vessel</p> <p>b. Operation and basic servicing of onboard ELV and LV systems may be carried out:</p> <ol style="list-style-type: none"> a.1. by day or night in both normal and emergency situations a.2. under any permissible conditions of weather a.3. while underway a.4. while anchored or moored a.5. during servicing operations a.6. when vessel is slipped <p>c. Extra low voltage and low voltage systems may include:</p> <ol style="list-style-type: none"> c.1. lead acid batteries c.2. circuit breakers c.3. wiring c.4. switches and lights c.5. starter motors and alternators <p>d. Basic servicing may include:</p> <ol style="list-style-type: none"> d.1. routine checks of systems and equipment d.2. identification and reporting of faults and arranging for repair or replacement <p>e. Typical operation and basic servicing tasks in extra low voltage systems may include:</p> <ol style="list-style-type: none"> e.1. operating main switches e.2. identifying switches e.3. changing a fuse e.4. checking and replacing a blown lamp e.5. testing and checking a battery e.6. reading basic ammeters e.7. checking navigation lights e.8. repairing loose wires e.9. identifying and fixing bad connections e.10. ensuring batteries are properly vented and there is no gas build up e.11. identifying and fixing battery leaks e.12. checking that wiring is correctly connected e.13. checking belt tension on an alternator <p>f. Servicing tools and equipment may include:</p> <ol style="list-style-type: none"> f.1. hand tools including screw drivers, pliers, cutters, soldering iron, etc. f.2. meters and instrumentation f.3. protective clothing and equipment such as: <ol style="list-style-type: none"> f.3.1. eye and ear protection f.3.2. head gear and safety boots
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ol style="list-style-type: none"> a.1. relevant sections of the Australian USL Code dealing with small vessels a.2. vessel and company servicing procedures for ELV systems a.3. equipment manufacturer's instructions, specifications and procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ol style="list-style-type: none"> a.1. Australian USL Code a.2. Relevant State/Territory electrical licensing requirements and wiring rules a.3. Regulations of relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW VOLTAGE AND LOW VOLTAGE ELECTRICAL SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carry out basic operation of ELV and LV electrical systems on a small vessel a.2. Carry out routine basic servicing and checks of ELV and LV electrical systems on a small vessel a.3. Identify typical problems related to the operation and basic servicing of ELV and LV systems and take appropriate action in conjunction with other officers and crew a.4. Exercise all required safety, environmental and hazard control precautions and procedures during operational and servicing operations a.5. Communicate effectively with others when carrying out operations and servicing procedures onboard a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a Marine Engine Driver (Grade 3).</p>
<p>3. Required knowledge and skills</p>	<p>a. Relevant OH&S legislation and policies</p> <p>b. Typical procedures for the operation and basic routine servicing of ELV and LV systems on a small vessel falling specifications and within the limits of responsibility of a Marine Engine Driver (Grade 3)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><i>Note: All installation, maintenance and repair of AC (50 volts or above) DC (above 115 volts) must be carried out only by a suitably qualified engineer or licensed tradesman. Relevant State/Territory electrical licensing requirements must be fulfilled by any persons carrying out installation, maintenance and repair of electrical circuits and systems at such voltages on a vessel.</i></p> </div> <p>c. Safety, environmental and hazard control precautions and procedures relevant to the operation and routine servicing of ELV and LV systems on a small vessel</p> <p>d. Principle features and operating characteristics of typical ELV and LV systems used on small vessels, including:</p> <ul style="list-style-type: none"> d.1. basic care and servicing of shipboard electrical systems generally d.2. DC systems d.3. batteries – types, care, servicing, hazards and safety precautions d.4. procedures and precautions when connecting batteries d.5. use of fuses and circuit breakers including the selection of correct capacity d.6. types of starter motors and alternators typically used on small vessels <p>e. Procedures for isolating equipment in an ELV and LV electrical systems</p> <p>f. Typical problems related to the during the operation and basic servicing of ELV and LV systems on small vessels and appropriate action and solutions</p> <p>g. Maritime communication techniques needed during the operation and basic servicing of auxiliary systems on small vessels</p> <p>h. Types of running logs and servicing records that must be maintained on a vessel to meet the requirements of the company and regulatory authorities</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to</p> <ul style="list-style-type: none"> a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate and carry out routine servicing of ELV and LV systems on a small vessel, and/or a.2. operate and carry out routine servicing of ELV and LV systems on an operational small commercial or training vessel

Evidence Guide (continued)

OPERATE AND CARRY OUT BASIC ROUTINE SERVICING OF MARINE EXTRA LOW VOLTAGE ELECTRICAL SYSTEMS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 operating and carrying out basic routine servicing of ELV and LV systems a.2 identifying and evaluating operational and servicing problems and determining appropriate courses of action a.3 applying safety precautions relevant to the operation and servicing of ELV and LV systems a.4 identifying and implementing improvements to procedures for the operation and routine servicing of ELV and LV systems <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of the Australian USL Code b.2 OHS regulations, pollution control and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant vessel manufacturer's guidelines relating to the operation and basic routine servicing of ELV and LV systems <p>c. Action is taken promptly to report and/or rectify issues and problems identified with the operation and routine servicing of ELV and LV systems in accordance with manufacturer's instructions, statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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

TDM MR33 01A PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A VESSEL

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the seamanship skills, knowledge and techniques required when performing routine rigging operations and using associated equipment on a commercial vessel in accordance with safe working practices.

ELEMENT	PERFORMANCE CRITERIA
1. Use and maintain ropes and wire	<ul style="list-style-type: none"> a. Knots, hitches and bends using fibre and synthetic ropes are correctly made and used in the course of deck operations onboard a commercial vessel b. Eye splices and short splices are made in fibre and synthetic rope in accordance with established nautical practice c. Rope, wire and cables are used and maintained in accordance with company procedures and manufacturer's instructions
2. Operate lifting gear	<ul style="list-style-type: none"> a. Lifting gear is checked and prepared for operation prior to use b. Defective lifting gear is identified and isolated, reported and maintained in accordance with shipboard practices and recognised standards c. Loads are correctly rigged using appropriate ropes and rigging gear in accordance with procedures and safety requirements d. Maximum load limits as determined by the responsible officer are not exceeded when lifting equipment and loads using ropes, chains and rigging in accordance with shipboard procedures e. Lifting gear is safely operated to carry out deck operations in accordance with requirements and manufacturer's instructions
3. Rig and maintain personnel and pilot access ways	<ul style="list-style-type: none"> a. Personnel access equipment is correctly rigged in accordance with shipboard practices and recognised standards b. The requirements and recommendations for safe access by alternative means such as helicopter or cargo ramps are identified and organised in accordance with shipboard practices and recognised standards
4. Perform tasks aloft and over ship's side	<ul style="list-style-type: none"> a. Site and equipment for working aloft are prepared in accordance with shipboard practices and recognised standards b. Required precautions are taken when working aloft or over the side c. Chairs, stages, safety harnesses and appropriate safety equipment is used in accordance with shipboard practices and recognised standards d. Portable ladders are correctly used and maintained e. Equipment used when working aloft is correctly maintained and stored
5. Lash and secure cargo	<ul style="list-style-type: none"> a. Lashing equipment is inspected and maintained in accordance with shipboard practices and recognised standards b. Faulty lashing equipment is identified and isolated, reported and maintained in accordance with shipboard practices and recognised standards c. Cargo is lashed and secured in accordance with shipboard practices and recognised standards d. Appropriate consideration is given to the effects of ship's motion on stowed cargo when lashing cargo e. Lashing equipment used is correctly stored after use

Range Of Variables

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations. b. Work is performed within defined operational procedures, with responsibility for own outputs in relation to specified quality standards. It involves performing routine rigging operations and using associated equipment in accordance with safe working practices
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Rigging operations may be carried out <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when berthed c. Rigging operations may include: <ul style="list-style-type: none"> c.1. using and maintaining ropes, wires and chains c.2. splicing natural fibre and synthetic ropes c.3. checking and using lifting equipment, ropes, chains and rigging gear when lifting loads c.4. rigging accommodation ladders, gangways and man baskets c.5. rigging Pilot ladders, and combined pilot-accommodation ladders and pilot hoists c.6. lashing cargo d. Knots and splices may include: <ul style="list-style-type: none"> d.1. Figure of eight d.2. Reef knot d.3. Clove hitch d.4. Rolling hitch d.5. Sheet bend, d.6. sheep shank d.7. bowline on the bite d.8. carrick bend d.9. marline spike hitch d.10. eye splice d.11. short splice d.12. common whipping d.13. west country whipping d.14. sail makers whipping d.15. common seizing d.16. racking seizing e. Personnel access equipment may include: <ul style="list-style-type: none"> e.1. accommodation ladders e.2. gangways e.3. man baskets e.4. brows e.5. pilot ladders e.6. combined pilot-accommodation ladders and pilot hoists f. Lifting gear may include: <ul style="list-style-type: none"> f.1. cranes f.2. derricks f.3. winches f.4. hoists f.5. grabs f.6. spreaders

Range Of Variables (continued)

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A VESSEL

2. Worksite environment (continued)	<p>g. Lifting gear components may include:</p> <ul style="list-style-type: none">g.1. shacklesg.2. hooksg.3. slingsg.4. blocksg.5. tacklesg.6. hoistsg.7. eyeboltsg.8. beam clampsg.9. trolleys <p>h. Equipment for working aloft and over the side may include:</p> <ul style="list-style-type: none">h.1. gantlinesh.2. Bosun' chairh.3. safety harnessesh.4. stage <p>i. Cargo to be lashed may include:</p> <ul style="list-style-type: none">i.1. general cargoi.2. containersi.3. RO-RO vehiclesi.4. timber deck cargo
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none">a.1. ISM Code Safety Management System proceduresa.2. shipboard rigging proceduresa.3. manufacturer's instructions and recommended proceduresa.4. relevant Australian and international standards and regulations
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none">a.1. relevant sections of IMO STCW 95 Code and Conventiona.2. ISM Code Safety Management Systema.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A VESSEL

1. Critical aspects of evidence to be considered	a. Assessment must confirm appropriate knowledge and skills to: a.1. Use and maintain ropes and wire a.2. Operate lifting gear a.3. Rig and maintain personnel and pilot access ways a.4. Perform tasks aloft and over ship's side a.5. Lash and secure cargo a.6. Exercise all required safety and hazard control procedures when carrying out rigging operations a.7. Communicate effectively with others during rigging operations
2. Interdependent assessment of units	a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating
3. Required knowledge and skills	a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Types of knots, bends and hitches in common use, their characteristics, applications and limitations, and methods of tying them using synthetic and fibre rope of varying construction and size d. Procedures for splicing synthetic fibre rope e. Breaking strain and safe working load for ropes and equipment f. Principles of rope deterioration and care and maintenance requirements for different types of rope and wire g. Principles and limitations of lifting equipment and components h. Procedures for checking and operating lifting equipment including slinging of loads and various lifting fittings and arrangements i. Precautions and procedures for working aloft and over the side j. Maintenance and storage procedures for equipment used when working aloft or over the side k. Procedures for rigging and preparing personnel access ways l. Legal requirements for the construction of a pilot ladder m. Principles and procedures for the lashing and securing of cargo including the inspection and maintenance requirements for lashing equipment n. Maritime communication techniques
4. Resource implications	Access is required to opportunities to either: a. a suitable range of appropriately-simulated rigging, lifting and cargo lashing exercises, situations and case studies and associated resources; and/or b. assist with rigging, lifting and cargo lashing operations on a working vessel

Evidence Guide (continued)

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning seamanship knowledge and skills when:</p> <ul style="list-style-type: none"> a.8. using and maintaining ropes and wire a.9. operating lifting gear a.10. rigging and maintaining personnel and pilot access ways a.11. performing tasks aloft and over ship's side a.12. lashing and securing cargo <p>a.1 applying safety precautions during rigging operations</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant sections of marine regulation b.2 ISM Code Safety Management System procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of ropes, wires, cables, anchors, deck equipment and machinery, including instructions on equipment capability and limitations b.6 following on-board housekeeping processes <p>c. Action taken promptly to report and/or rectify accidents, safety incidents and operational problems in accordance with regulations and procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDM MR34 01A OPERATE DECK MACHINERY

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to operate deck machinery installed on a commercial vessel, including anchoring equipment, mooring equipment, cargo hatch covers, cranes and derricks, lifeboat davits, gangways and pilot ladders, ventilators and breathers and fairleads and rollers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate deck machinery</p>	<ul style="list-style-type: none"> a. Pre-operational checks of deck machinery and associated systems are carried out in accordance with safety requirements and shipboard practices b. Operation of deck machinery is performed in accordance with manufacturer's specifications and instructions and safety requirements c. Any operational problems encountered in the use of deck machinery on the vessel are reported and/or rectified in accordance with procedures d. Malfunctioning equipment is identified and the nature of the fault is investigated and the outcomes reported in accordance with procedures e. Post-operational checks of deck machinery and associated systems are carried out in accordance with safety requirements and shipboard practices f. Records of equipment status and identified defects and malfunctions are completed in accordance with procedures
<p>2. Carry out routine planned maintenance of deck machinery</p>	<ul style="list-style-type: none"> a. Maintenance arrangements for deck machinery on the vessel carried out in accordance with survey requirements and manufacturer's specifications b. Operational problems or faults with the vessel's deck machinery are identified and the causes identified c. Any restrictions to operations arising from identified malfunctions of the deck machinery are justified and reported as required d. Routine lubrication and other preventative maintenance of deck machinery is carried out in accordance with manufacturer's instructions e. Faulty deck machinery, equipment and parts are identified, reported and repaired or replaced in accordance with manufacturer's instructions and procedures f. Required adjustments to the deck machinery are carried out in accordance with manufacturer's specifications g. Records of preventative and remedial maintenance carried out on deck machinery are completed in accordance with procedures
<p>3. Apply safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times during the operation of deck machinery b. Operational and maintenance hazards related to deck machinery use and maintenance are identified and action is taken to minimise or eliminate risk to personnel, vessel and the environment c. Action is taken in the event of failure or emergency to ensure the isolation and security of the deck machinery and maintain the safety of the vessel and personnel involved d. Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving deck machinery

Range Of Variables

OPERATE DECK MACHINERY

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulatory requirements for the operation and maintenance of deck machinery. b. Work is performed within established operational requirements, with responsibility for own outputs in relation to specified quality standards and limited responsibility for within a team in achieving the specified quality and quantity of outcomes. It involves the operation and planned routine maintenance of deck machinery on a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Operation and maintenance of the deck machinery may be carried out: <ul style="list-style-type: none"> a.1. by day or night a.2. while underway a.3. during berthing and unberthing operations a.4. while anchoring or mooring a.5. while in port a.6. while moored or at anchor c. Maintenance may include <ul style="list-style-type: none"> c.1. planned maintenance systems c.2. operational checks c.3. recording c.4. reporting c.5. isolation c.6. cleanliness c.7. use of correct tools, parts, and lubricants c.8. worksite preparation d. Deck Machinery may include <ul style="list-style-type: none"> d.1. anchoring windlasses d.2. mooring equipment d.3. cargo hatch covers d.4. cranes and derricks d.5. lifeboat davits d.6. gangways and pilot ladders d.7. ventilators and breathers d.8. fairleads and rollers e. Hydraulic Components of deck machinery may include <ul style="list-style-type: none"> e.1. pump e.2. reservoir e.3. rams e.4. motors e.5. filters e.6. coolers e.7. valves, e.8. control valves and relief valves e.9. pipes and hoses f. Maintenance tools and equipment may include: <ul style="list-style-type: none"> f.1. Hand and power tools f.2. greasing and lubrication tools f.3. protective clothing and equipment such as: <ul style="list-style-type: none"> f.3.1. eye and ear protection f.3.2. safety boots and helmet f.3.3. dust and fume masks

Range Of Variables (continued)

OPERATE DECK MACHINERY

2. Worksite environment (continued)	<p>g. Hazards when operating and maintaining deck machinery may include:</p> <ul style="list-style-type: none">g.1. rotating and moving partsg.2. high pressure systemsg.3. slippery deckg.4. sharp tools and implementsg.5. power toolsg.6. electrical circuitsg.7. cleaning chemicalsg.8. oilg.9. pollutiong.10. heatg.11. cables and ropesg.12. faulty machinery equipment handling equipment and lifting gearg.13. using equipment beyond safe working limitsg.14. poor housekeeping proceduresg.15. non-compliance with safe working procedures
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none">a.1. ISM Code safety management system plans, procedures, checklists and instructionsa.2. planned maintenance systema.3. OHS regulations and policya.4. maintenance recordsa.5. deck machinery manufacturer's instructions, specifications and recommended proceduresa.6. relevant Australian standards
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none">a.1. sections of the IMO STCW 95 Code and Convention and AMSA Marine Orders related to deck operations and maintenancea.2. relevant Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

OPERATE DECK MACHINERY

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Use and carry out planned routine maintenance of deck machinery a.2. Identify typical problems related to the deck machinery operation and maintenance and take appropriate action in conjunction with other vessel personnel a.3. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures during deck machinery operation and maintenance a.4. Communicate effectively with others during the operation and maintenance of deck machinery
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Sections of the relevant maritime regulations b. Relevant OH&S and pollution control legislation and codes of practice c. Principle design and safety features and component parts of deck machinery d. Procedures for operating and carrying out planned maintenance of deck machinery e. Procedures for isolating defective deck machinery or components f. Repair and/or replacement procedures for deck machinery and components g. Principles and procedures of machinery lubrication as they relate to deck machinery on a vessel, including: <ul style="list-style-type: none"> g.1. application of grease g.2. changing of gearbox lubricating oil g.3. lubrication of a steel wire rope is demonstrated g.4. the applications and use of "denso" tape are identified g.5. the changing of lubricating and hydraulic oil h. Procedures for the replacement of flexible hoses in deck machinery i. Procedures for using hand and power tools for typical maintenance operations on deck machinery j. Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions k. Safety, environmental and hazard control precautions and procedures relevant to the operation and maintenance of deck machinery l. Safe procedures for handling heavy machinery and component parts during maintenance of deck machinery m. Knowledge and ability to read and interpret material safety data sheets n. Knowledge and ability to read and interpret operational manuals and specifications. o. Maritime communication techniques needed during the use and maintenance of deck machinery on a vessel p. Maintenance records that must be maintained on a commercial vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to use and carry out planned routine maintenance of deck machinery on a vessel, and/or a.2. use and carry out planned routine maintenance of deck machinery on an operational commercial or training vessel

Evidence Guide (continued)

OPERATE DECK MACHINERY

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 using and carrying out planned routine maintenance of deck machinery a.2 identifying and operational and maintenance problems and determining appropriate courses of action a.3 ensuring the application of safety precautions relevant to use and maintenance of deck machinery b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of maritime regulations b.2 ISM Safety Management Code procedures b.3 OHS regulations, pollution control and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant deck machinery manufacturer's guidelines relating to operation routine maintenance procedures b.6 environmental protection procedures when carrying out maintenance operations c. Action taken promptly to report and/or rectify defective or malfunctioning deck machinery, equipment and components in accordance with manufacturer's instructions and established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDM MR43 01A ASSIST IN MOORING AND ANCHOR HANDLING ACTIVITIES

Field MF Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge needed to assist the responsible officer in a range of mooring and anchor handling activities as required of an integrated rating, including preparing for arrival or departure from an anchorage or mooring, handling mooring lines, carrying out stoppering and heaving line tasks, anchor operations, securing a vessel to a sea buoy, and securing a tug using either tug's or vessel's lines.

ELEMENT	PERFORMANCE CRITERIA
1. Carry out mooring and anchor handling tasks	<ul style="list-style-type: none">a. Tasks required of an integrated rating in preparation for arrival and departure from an anchorage or mooring are completed in accordance with shipboard proceduresb. Mooring line handling, stoppering and heaving line tasks are performed in accordance with shipboard proceduresc. Mooring and unmooring operations are carried out in accordance with established proceduresd. Anchor operations are carried out in accordance with shipboard procedurese. Vessel is secured to a sea buoy in accordance with shipboard proceduresf. A tug is secured using tug's or vessel's lines in accordance with shipboard proceduresg. Communications during mooring and anchor handling operations are clear and timely and involve the correct use of communications equipment where required
2. Follow safety and hazard control procedures	<ul style="list-style-type: none">a. All required safety precautions and regulations are followed when carrying out routine mooring and anchor handling tasksb. Operational hazards are identified and action is taken in conjunction with the officers, engineers and other team members to minimise or eliminate risk to personnel, vessel and the environmentc. Shipboard emergency and contingency plans are followed in the event of a failure or emergency associated with mooring and anchor handling equipment and machinery and associated systems

Range Of Variables

ASSIST IN MOORING AND ANCHOR HANDLING ACTIVITIES

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulatory requirements. b. Work is performed as a member of an anchoring or mooring party under defined operational requirements, with some accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of basic mooring and anchor handling procedures across a variety of operational contexts. Following of orders and instructions of the officer on watch is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Mooring operations include: <ul style="list-style-type: none"> b.1. throwing heaving lines b.2. running out mooring lines b.3. reporting distance off b.4. securing mooring lines b.5. letting go mooring lines b.6. recovering mooring lines b.7. making fast fore and aft to a fixed terminal or jetty b.8. making fast to a single point mooring b.9. making fast to a conventional buoy mooring b.10. preparing mooring area for operations b.11. making fast and letting go tugs b.12. adjusting moorings during a port stay b.13. securing mooring area on departure b.14. rigging gangways, accommodation ladders and pilot ladders b.15. stowing mooring lines after use c. Mooring equipment includes: <ul style="list-style-type: none"> c.1. man-made fibre and wire-rope moorings c.2. heaving lines and stoppers - (rope and chain) c.3. tension winches c.4. stand clone winches c.5. electric, hydraulic and hand driven capstans/drum ends c.6. dead men and fairheads d. Equipment malfunctions or problems may include: <ul style="list-style-type: none"> d.1. failure of moorings or equipment d.2. damage to moorings d.3. insufficiency of moorings d.4. poor leads d.5. inability to maintain ship in position e. Routine and emergency anchor operations may include: <ul style="list-style-type: none"> e.1. dropping, paying out and holding an anchor e.2. reporting amount and lie of cable e.3. letting go and weighing anchor e.4. securing to a single anchor e.5. securing to twin anchors e.6. recovering anchor e.7. clearing anchor and cable e.8. recovering a foul hawse e.9. hanging off an anchor f. Anchor equipment may include: <ul style="list-style-type: none"> f.1. cable f.2. securing arrangements f.3. anchor balls f.4. cable locker

Range Of Variables (continued)

ASSIST IN MOORING AND ANCHOR HANDLING ACTIVITIES

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>g. Operational hazards during mooring or anchor handling operations may include:</p> <ul style="list-style-type: none"> g.1. failure of moorings, anchor or equipment g.2. damage to moorings g.3. insufficiency of moorings g.4. faulty or damaged machinery and equipment g.5. moving and rotating machinery g.6. using equipment beyond safe working limits g.7. cables and ropes g.8. poor leads g.9. inability to maintain ship in position g.10. moving heavy loads using unsafe lifting procedures g.11. slippery deck g.12. poor housekeeping procedures g.13. non-compliance with safe working procedures
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. IMO STCW 95 Code and Convention a.3. AMSA Marine Orders a.4. orders and instructions of the officer on watch a.5. vessel and company procedures a.6. instructions of relevant Maritime Authorities a.7. relevant Australian and international standards
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. ISM Code a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ASSIST IN MOORING AND ANCHOR HANDLING ACTIVITIES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carrying out mooring and anchor handling tasks a.2. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures during mooring and anchor handling activities a.3. Communicate effectively with others during mooring and anchor handling activities
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant maritime regulations b. Relevant OH&S and pollution control legislation and policies c. Mooring and anchor handling procedures on board a vessel d. Functions and responsibilities of the members of the bridge and engine room teams onboard a vessel e. Procedures for carrying out the routine tasks required of an integrated rating when a vessel is arriving at or departing from a berth or anchorage f. Types, features and characteristics of fibre and wire ropes g. Hazards and related safety precautions when carrying out mooring and anchor handling activities h. Signs of fatigue i. Fatigue management principles and techniques j. Communication techniques and equipment used during mooring and anchor handling operations
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to carry out mooring and anchor handling procedures through appropriate case studies, practical exercises and simulated situations; and/or a.2. carry out mooring and anchor handling procedures on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. carrying out mooring and anchor handling tasks a.2. exercising all required safety, environmental and hazard control precautions and procedures during mooring and anchor handling tasks a.3. communicating effectively with others during routine shipboard tasks b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 ISM Code and associated vessel's Safety Management System and procedures b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions related to mooring and anchor handling activities b.4 following housekeeping processes c. Action taken promptly to report operational incidents and problems in accordance with regulations and shipboard procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

ASSIST IN MOORING AND ANCHOR HANDLING ACTIVITIES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDM MR44 01A ASSIST IN COMPLETION OF DECK OPERATIONS AND MAINTENANCE DOCUMENTATION

Field MF Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to assist deck officers in the conduct of routine Deck measurements on a commercial vessel and the keeping of records of Deck operational and maintenance measurements and routine equipment inventory data on board a vessel.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Carry out routine measurements</p>	<p>a. Equipment and instruments used to carry out routine are prepared where required in accordance with established procedures and manufacturer's instructions</p> <p>b. Routine measurements at sea, in port and while on duty are carried out in accordance with established procedures and the limits of responsibility of and integrated ratings on a vessel</p> <p>c. Data collected from routine measurements is recorded or entered into the computer in accordance with established procedures</p>
<p>2. Assist in the completion of operations and maintenance documentation</p>	<p>a. Inventory control sheets are completed as directed in accordance with shipboard procedures</p> <p>b. Deck maintenance data is collected as directed in accordance with maintenance system procedures</p> <p>c. Deck maintenance record sheets are completed in accordance with planned maintenance procedures</p> <p>d. Deck operational data is collected and recorded as directed in accordance with established procedures</p> <p>e. Where relevant, operational, maintenance and inventory data is entered into the vessel's computer database</p> <p>f. Completed documentation is submitted to the Deck Officer in accordance with established procedures</p>

Range Of Variables

ASSIST IN COMPLETION OF DECK OPERATIONS AND MAINTENANCE DOCUMENTATION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulatory requirements. b. Work is performed as an integrated rating under the supervision of the responsible officers, with some accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of basic measurement techniques to collect and record routine deck operational and maintenance data when in port, at sea. Following of orders and instructions of the deck officer on watch is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Routine measurements on a vessel may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Routine sounding and measuring tasks may include: <ul style="list-style-type: none"> c.1. hold temperature c.2. dry and wet bulb temperature c.3. reefer temperatures c.4. air pressures c.5. humidity c.6. water depth by hand or deep sea lead line c.7. ship's draft c.8. soundings, levels and ullages c.9. liquid flow c.10. water density c.11. cargo amounts
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. orders and instructions of the officer on watch a.3. established procedures for routine measurement and the recording of operational, maintenance and inventory data on board a vessel a.4. instructions of the manufacturers of measuring instruments and equipment
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and regulations may include <ul style="list-style-type: none"> a.1. ISM Code a.2. relevant data recording procedures to comply with regulatory and survey requirements a.3. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ASSIST IN COMPLETION OF DECK OPERATIONS AND MAINTENANCE DOCUMENTATION

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carry out routine deck measurements falling within the limits of responsibility of an integrated rating a.2. Record data collected through routine deck measurements a.3. Enter measurement and inventory data into the relevant logs or computer databases a.4. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures when carrying out routine shipboard measurements a.5. Communicate effectively with others when taking and recording routine shipboard measurements
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation and policies b. Functions and responsibilities of the officers and crew members for collection, recording and interpretation of routine measurements on board a vessel c. Responsibilities of an integrated rating and procedures for the taking and recording of routine measurements on a vessel: <ul style="list-style-type: none"> c.1. when at sea c.2. when in port d. Procedures for carrying out the routine sounding and measuring tasks required of an integrated rating e. Procedures for the entering of collected data into a vessel's computer databases f. Precautions that must be taken when carrying out routine shipboard measurements g. Communication techniques and equipment required when carrying out routine measurements and data recording on a vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to carry out routine measurements and data recording tasks on board a vessel through appropriate case studies, practical exercises and simulated situations; and/or a.2. carry out routine measurements and data recording tasks as an integrated rating on an operational commercial or training vessel

Evidence Guide (continued)

ASSIST IN COMPLETION OF OPERATIONS AND MAINTENANCE DOCUMENTATION

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.6. carrying out routine shipboard measurements a.7. recording data collected through routine shipboard measurements a.8. entering measurement and inventory data into the relevant logs or computer databases a.9. exercising all required safety, environmental and hazard control precautions and procedures when carrying out routine shipboard measurements <p>a.1. communicating effectively with others during routine shipboard tasks</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 sections of relevant maritime regulations b.2 ISM Code and associated vessel's Safety Management System and procedures b.3 OHS regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 following bridge housekeeping processes <p>c. Action taken promptly to report operational incidents and problems in accordance with regulations and shipboard procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDM MR45 01A PROVIDE SUPPORT IN COMPLETING CARGO AND BUNKERING OPERATIONS

Field MF Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to provide support to the responsible officer in the completion of a range of cargo operations on board a commercial vessel as required of an integrated rating, including carrying out hatch cover operations, cleaning and preparing cargo spaces, lashing cargo, assisting in tanker cargo operations, and assisting in routine bunkering operations.

ELEMENT	PERFORMANCE CRITERIA
1. Carry out hatch cover operations	<ul style="list-style-type: none"> a. Assistance is provided in hatch opening and closing operations in accordance with established procedures and under the supervision of the responsible officer b. Carry out checks and routine maintenance on hatch securing and opening devices and machinery in accordance with established procedures and under the supervision of the responsible officer c. Assistance is provided in securing hatch covers for sea in accordance with established procedures and under the supervision of the responsible officer
2. Clean and prepare cargo spaces	<ul style="list-style-type: none"> a. Assistance is provided in cleaning and preparation of a cargo space in accordance with established procedures and under the supervision of the responsible officer b. Assistance is provided in the opening, checking, cleaning and sealing of a bilge and the dismantling of a strum box
3. Lash cargo	<ul style="list-style-type: none"> a. Assistance is provided in the lashing of cargo in accordance with established procedures and under the supervision of the responsible officer b. Appropriate precautions are taken during cargo lashing procedures to avoid cargo damage c. Faulty and defective lashing and securing gear and equipment is identified, marked and reported to the responsible officer
4. Assist in tanker cargo operations	<ul style="list-style-type: none"> a. Assistance is provided in the setting up the valve and pipework system of a tanker in preparation for loading and discharging as directed by the supervising officer b. Assistance is provided in the routine checks and maintenance of the inert gas and ventilation systems on a tanker under the supervision of the responsible officer c. Assistance is provided in tank cleaning and gas freeing operations in accordance with established procedures and under the supervision of the responsible officer d. Assistance is provided in port arrival procedures in preparation for cargo handling operations as directed by the supervising officer e. Assistance is provided in the gauging and sampling of a tank and the monitoring of liquid cargo in accordance with established procedures and under the supervision of the responsible officer f. Assistance is provided in the topping off a tank and tank changeover operations in accordance with established procedures and under the supervision of the responsible officer g. Assistance is provided in the securing the vessel for sea following tanker cargo handling operations

<p>5. Assist in bunkering operations</p>	<ul style="list-style-type: none"> a. Assistance is provided in carrying out pre-bunkering activities in accordance with established procedures and under the supervision of the responsible officer b. A checklist for bunkering activities is completed in accordance with established procedures and under the supervision of the responsible officer c. Routine bunkering activities are carried out as directed by the supervising officer d. Assistance is provided in containment of spills in accordance with established procedures and under the supervision of the responsible officer e. Assistance is provided in emergency response in accordance with established procedures and under the supervision of the responsible officer f. Assistance is provided in carrying out post-bunkering activities as directed by the supervising officer
<p>6. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precautions and regulations are followed when carrying out cargo handling operations b. Operational hazards are identified and action is taken in conjunction with the officers, engineers and other members of the crew to minimise or eliminate risk to personnel, vessel and the environment c. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed d. Shipboard emergency and contingency plans are followed in the event of a failure or emergency during cargo handling operations

Range Of Variables

PROVIDE SUPPORT IN COMPLETING CARGO AND BUNKERING OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulatory requirements. b. Work is performed as an integrated rating under the supervision of the responsible officers with some accountability and responsibility for self in achieving the prescribed outcomes. It involves the application of established procedures and techniques to the cargo and bunkering tasks falling within the limits of responsibility of an integrated rating on a vessel. Following of orders and instructions of the officer on watch is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Assistance in cargo operations may be provided: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. while in port b.5. while moored or at anchor c. Dry cargo may include: <ul style="list-style-type: none"> c.1. general cargo stored in a cargo space or on a hatch c.2. deck cargo c.3. cargo containers c.4. vehicles and trailers c.5. equipment and stores c.6. bulk cargo d. Bunkering tasks may include: <ul style="list-style-type: none"> d.1. carrying out pre-bunkering activities d.2. completing a checklist for bunkering activities d.3. routine bunkering activities d.4. containment of spills d.5. emergency response d.6. carrying out post-bunkering activities e. Operational hazards for dry cargo operations may include: <ul style="list-style-type: none"> e.1. moving heavy loads using unsafe lifting procedures e.2. unsecured cargo, deck machinery, components or equipment e.3. slippery deck e.4. moving and rotating machinery e.5. faulty lifting/lashing gear and equipment e.6. using equipment beyond safe working limits e.7. poor housekeeping procedures e.8. working in confined spaces e.9. non-compliance with safe working procedures f. Operational hazards for tanker and bunkering operations may include: <ul style="list-style-type: none"> f.1. sources of ignition leading to explosion and fire f.2. electrostatic generation leading to discharge f.3. environmental hazards to air and water f.4. reactivity hazards including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents f.5. spills or release of toxic fluids, vapours and gases, involving skin contact and inhalation f.6. corrosion hazards to personnel, vessel structures and equipment f.7. working in confined spaces
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. orders and instructions of the officer on watch a.3. vessel and company procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. relevant sections of IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. ISM Code a.4. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PROVIDE SUPPORT IN COMPLETING CARGO AND BUNKERING OPERATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Assist in carrying out hatch cover operations, a.2. Assist in cleaning and preparing cargo spaces a.3. Assist in the lashing of cargo a.4. Assist in tanker cargo operations a.5. Assist in bunkering operations a.6. Apply all required safety, environmental and hazard control precautions and procedures during cargo and bunkering operations a.7. Communicate effectively with others during cargo and bunkering operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a trading vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation and policies b. Cargo handling and bunkering procedures on board a vessel c. Functions and responsibilities of the officers and crew members during cargo and bunkering operations on board a vessel d. Procedures for various cargo and bunkering operations on a vessel, including: <ul style="list-style-type: none"> d.1. carrying out hatch cover operations d.2. cleaning and preparing cargo spaces d.3. lashing and securing of various types of cargo d.4. bunkering operations (as required of an integrated rating) d.5. setting up the valve and pipework system of a tanker (as required of an integrated rating) d.6. tank cleaning and gas freeing operations on a tanker (as required of an integrated rating) e. Hazards and related safety precautions when carrying out cargo and bunkering operations f. Special hazards and precautions for cargo operations on board tankers, including: <ul style="list-style-type: none"> f.1. tank layouts and valve and pipeline systems on various types of tankers f.2. physical properties of oils, gases and chemicals carried in bulk f.3. basic principles of toxicity f.4. causes of explosions on tankers and related preventative measures f.5. safety, environmental, reactive, corrosive and other hazards associated with tanker and bulk cargoes and related hazard control methods f.6. procedures and policies for the use of personal protection clothing and equipment (PPE) f.7. procedures for the use of escape/evacuation equipment f.8. procedures for the prevention of air and water pollution f.9. procedures to be taken in the event of an accidental cargo spillage of liquid cargo on a tanker g. Techniques and precautions required when lashing various types of cargo carried on vessels h. Basic environmental protection measures during cargo and bunkering operations i. Communication techniques and equipment used during cargo and bunkering operations on board a vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to assist in routine cargo and bunkering tasks on board a vessel through appropriate case studies, practical exercises and simulated situations; and/or a.2. assist in routine cargo and bunkering tasks on board an operational commercial or training vessel

Evidence Guide (continued)

PROVIDE SUPPORT IN COMPLETING CARGO AND BUNKERING OPERATIONS

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. carrying out hatch cover operations, a.2. cleaning and preparing cargo spaces a.3. lashing cargo a.4. assisting in tanker cargo operations a.5. assisting in bunkering operations a.6. exercising all required safety, environmental and hazard control precautions and procedures during cargo and bunkering operations a.7. communicating effectively with others during cargo and bunkering operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. ISM Code and associated vessel's Safety Management System and procedures b.2. OHS regulations and hazard prevention policies and procedures b.3. job procedures and work instructions b.4. instructions and orders of officers on the vessel c. Action taken promptly to report operational incidents and problems in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDM MR46 01A ASSIST IN BASIC WELDING, BRAZING, CUTTING AND MACHINING OPERATIONS ON A VESSEL

Field MF Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to carry out basic welding, brazing, cutting and machining tasks under the supervision of an engineer, as may be required of an integrated rating on board a vessel.

ELEMENT	PERFORMANCE CRITERIA
1. Assist in basic welding tasks	<ul style="list-style-type: none"> a. Requirements for welding tasks are correctly interpreted from work instructions b. Parts are prepared for welding as directed by engineer in accordance with established practice c. Parts are welded as directed by the engineer d. Weld defects are identified and appropriate action taken in conjunction with supervising engineer e. Flame gouging methods are used to remove plate and weld material as directed by the supervising engineer f. Finished work is checked against work instructions for accuracy and quality
2. Assist in basic brazing tasks	<ul style="list-style-type: none"> a. Requirements for brazing tasks are correctly interpreted from work instructions b. Parts are prepared for brazing as directed by engineer in accordance with established practice c. Brazing equipment is prepared for brazing operations in accordance with established procedures d. Parts are brazed as directed by the engineer using established procedures e. Finished work is checked against work instructions for accuracy and quality
3. Assist in basic cutting tasks	<ul style="list-style-type: none"> a. Instructions are understood and required size and shape of cut work correctly identified and interpreted b. Work is correctly marked out in preparation for cutting as directed by the engineer c. Thermal cutting plant and equipment is set up in accordance with established procedures d. Steel plate and/or rolled sections are cut to shape and size as directed by the engineer in accordance with established procedures e. Finished work is checked against work instructions for accuracy and quality
4. Assist in basic machining tasks	<ul style="list-style-type: none"> a. Requirements for basic machining tasks are correctly interpreted from work instructions in association with the supervising engineer b. Work is correctly marked out in preparation for basic machining as directed by the engineer c. Machine is set up in accordance with established procedures d. Machining is carried out under the supervision of the engineer in accordance with established procedures e. Finished work is checked against work instructions for accuracy and quality
5. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. All required safety precautions and regulations are followed when assisting in basic welding, brazing, cutting and machining tasks b. Operational hazards are identified and action is taken in conjunction with the supervising engineer to minimise or eliminate risk to personnel, vessel and the environment

Range Of Variables

ASSIST IN BASIC WELDING, BRAZING, CUTTING AND MACHINING OPERATIONS ON A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulatory requirements. b. Work is performed under the direction and supervision of a supervising engineer, with some accountability and responsibility for self in achieving the prescribed outcomes. It involves the application of basic welding, brazing, cutting and machining procedures and techniques across a defined range of shipboard tasks falling within the limits of responsibility of an integrated rating. Following of orders and instructions of the supervising engineer is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Assistance in basic welding, brazing, cutting and machining tasks may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. while in port b.3. while moored or at anchor b.4. when in dry dock c. Basic operations within the responsibility of an Integrated Rating may include: <ul style="list-style-type: none"> c.1. basic fillet welds c.2. basic butt welds c.3. basic pad welds c.4. manual metal arc welding c.5. oxygen acetylene welding c.6. basic machining operation within the responsibility of an Integrated Rating d. Operational hazards when assisting in welding, brazing, cutting and machining tasks may include: <ul style="list-style-type: none"> d.1. sharp tools and implements d.2. power tools d.3. moving and rotating machinery d.4. moving heavy loads using unsafe lifting procedures d.5. unsecured machinery, components or equipment d.6. use of welding equipment near explosive/flammable liquids and gases d.7. using equipment beyond safe working limits d.8. poor housekeeping procedures d.9. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. orders and instructions of the supervising engineer a.3. instructions of manufacturer of tools and equipment a.4. vessel and company procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable procedures and codes may include <ul style="list-style-type: none"> a.1. ISM Code a.2. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

ASSIST IN BASIC WELDING, BRAZING, CUTTING AND MACHINING OPERATIONS ON A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carrying out basic welding, brazing, cutting and machining tasks a.2. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures during basic welding, brazing, cutting and machining tasks a.3. Communicate effectively with supervising engineer during the completion of basic welding, brazing, cutting and machining tasks
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant maritime regulations b. Relevant OH&S and pollution control legislation and policies c. Procedures for the basic welding, brazing, cutting and machining tasks as may be required of an integrated rating d. Hazards and related safety precautions when carrying out basic welding, brazing, cutting and machining tasks e. Techniques for identifying defective welds (within limits of responsibility of an integrated rating) f. Ability to read and interpret work specifications and drawings g. Ability to mark out work to specifications and to measure and check the quality of finished work including the correct use of: <ul style="list-style-type: none"> g.1. rules and tapes g.2. squares g.3. scribes g.4. dividers g.5. trammels g.6. adjustable gauge g.7. centre punch hammers g.8. callipers g.9. vernier callipers g.10. micrometer h. Procedures for dressing and/or truing a grinding wheel i. Ability to identify a glazed, loaded or untrue grinding wheel condition j. Types, names and identifying features of drilling machines used on maritime vessels k. Characteristics and identifying features of common engineering drill bits l. Environmental protection measures when carrying out basic engineering tasks
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to carry out basic welding, brazing, cutting and machining tasks on board a vessel through appropriate practical exercises and simulated situations; and/or a.2. carry out basic welding, brazing, cutting and machining tasks on an operational commercial or training vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. carrying out basic welding, brazing, cutting and machining tasks a.2. exercising all required safety, environmental and hazard control precautions and procedures during basic welding, brazing, cutting and machining tasks basic welding, brazing, cutting and machining tasks shipboard tasks b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 ISM Code and associated vessel's safety management system and procedures b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 following housekeeping processes c. Action taken promptly to report operational incidents and problems in accordance with regulations and shipboard procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

ASSIST IN BASIC WELDING, BRAZING, CUTTING AND MACHINING OPERATIONS ON A VESSEL

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDM MR47 01A USE AND CARE FOR HAND AND POWER TOOLS CARRIED ON A VESSEL

Field MF Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to use and care for hand and power tools used by integrated ratings on board commercial vessels.

ELEMENT	PERFORMANCE CRITERIA
1. Select appropriate tools for work	<ul style="list-style-type: none"> a. Work requirements are interpreted in accordance with the instructions of the supervising engineer b. Appropriate hand and power tools are selected for the tasks required c. Selected hand and power tools are checked for their serviceability d. Defective tools are identified and reported and appropriate action is taken for their repair or replacement in accordance with established procedures e. Blunt or worn tools are identified and appropriate action taken to replace, sharpen or rectify the relevant blade, drill bit, or other tool component or attachment in accordance with established procedures and manufacturer's instructions f. Instructions for the use of the tools are accessed and interpreted if required
2. Use hand and power tools	<ul style="list-style-type: none"> a. Work area, work pieces and tools are prepared for the required tasks in accordance with the engineer's instructions and established practice b. Other personnel in the work area are made aware of the work being carried out as required by safety management procedures c. Where relevant, work is marked out using appropriate marking out tools in accordance with established procedures d. Hand and power tools are used for the tasks as directed and in accordance with established procedures and manufacturer's instructions e. Desired outcomes for the work are achieved to job specifications, including finish, tension, size, shape, etc. as required
3. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. All required safety precautions, procedures and regulations are followed when using hand and power tools b. Operational hazards are identified when using hand and power tools and action is taken in conjunction with others to minimise or eliminate risk to self, other personnel, the vessel and the environment
4. Care for hand and power tools	<ul style="list-style-type: none"> a. Tools are used only for their intended purposes in accordance with manufacturer's instructions and established procedures b. Tools are cleaned and stored after use in accordance with manufacturer's instructions and established procedures c. Where relevant, tools are sharpened in accordance with manufacturer's instructions and established procedures d. Where relevant, tools are adjusted, tightened and/or lubricated in accordance with manufacturer's instructions and established procedures e. Grinding wheels are dressed and made true in accordance with manufacturer's instructions and established procedures f. Defective or worn tools and tool components are identified, marked as required and reported, and appropriate action is taken for their repair or replacement in accordance with established procedures

Range Of Variables

USE AND CARE FOR HAND AND POWER TOOLS CARRIED ON A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime and safety regulatory requirements. b. Work is performed under the direction of a supervising engineer, with some accountability and responsibility for self in achieving the prescribed outcomes. It involves the use and care of hand and power tools required for the range of shipboard tasks that may be carried out by an integrated rating on board a vessel. Following of the orders and instructions of the supervising engineer is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Hand and power tools that may be used by an integrated rating on board a vessel may include: <ul style="list-style-type: none"> b.1. hand tools such as: <ul style="list-style-type: none"> b.1.1. spanners b.1.2. screw drivers, pliers b.1.3. vice grip b.1.4. punches b.1.5. torque wrenches b.1.6. hammers b.1.7. chisels b.1.8. files b.1.9. snips b.1.10. hacksaws b.1.11. nibblers b.1.12. drill bits b.1.13. taps b.2. power tools such as: <ul style="list-style-type: none"> b.2.1. portable and pedestal power drills b.2.2. drilling jigs b.2.3. portable and pedestal grinders b.2.4. jig saws b.2.5. shears b.2.6. power nibblers b.3. gauges such as: <ul style="list-style-type: none"> b.3.1. screw pitch b.3.2. radius b.3.3. feeler b.3.4. thickness b.3.5. form b.4. marking out and measuring tools such as: <ul style="list-style-type: none"> b.4.1. rules b.4.2. tapes b.4.3. squares b.4.4. scribes b.4.5. dividers b.4.6. trammels b.4.7. adjustable gauge b.4.8. centre punch hammers b.4.9. callipers b.4.10. vernier callipers b.4.11. micrometers c. Care of tools may include: <ul style="list-style-type: none"> c.1. cleaning c.2. sharpening (where relevant) c.3. storing c.4. using tools in accordance with manufacturer's instructions and established procedures c.5. using tools only for their intended purpose

Range Of Variables (continued)

USE AND CARE FOR HAND AND POWER TOOLS CARRIED ON A VESSEL

<p>3. Worksite environment (continued)</p>	<p>d. Safety precautions when using and caring for hand and power tools may include:</p> <ul style="list-style-type: none"> d.1. using personal protection clothing and equipment such as: <ul style="list-style-type: none"> d.1.1. eye and ear protection d.1.2. boots d.1.3. masks d.2. following manufacturer's instructions d.3. following ISM Code safety management procedures as they apply to the use of hand and power tools d.4. identifying hazards and using appropriate hazard minimisation strategies <p>e. Operational hazards when using and caring for hand and power tools may include:</p> <ul style="list-style-type: none"> e.1. sharp blades e.2. moving and rotating blades and attachments e.3. electric shock e.4. unsecured machinery, components or equipment e.5. sparks in areas where flammable and explosive substances are stored e.6. using tools beyond safe working limits e.7. poor housekeeping procedures e.8. non-compliance with safe working procedures
<p>4. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. orders and instructions of the supervising engineer a.3. instructions of manufacturer of tools and equipment a.4. vessel and company procedures
<p>5. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. ISM Code a.2. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

USE AND CARE FOR HAND AND POWER TOOLS CARRIED ON A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Select appropriate hand and power tools to complete assigned tasks a.2. Use hand and power tools in accordance with established procedures and manufacturer's instructions a.3. Care for hand and power tools in accordance with established procedures and manufacturer's instructions a.4. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures when using hand and power tools in accordance to complete assigned tasks a.5. Take appropriate action if a hand or power tool is found to be defective or worn
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. ISM Code safety management procedures as they relate to the use of hand and power tools on board a vessel b. Relevant OH&S and pollution control legislation and policies c. Types, names and identifying features of various hand and power tools carried on a vessel d. Established procedures for the use and care of hand or power tools required for work tasks that may be carried out by an integrated rating e. Hazards and related safety precautions when using hand or power tools on board a vessel f. Ability to read and interpret work specifications and drawings g. Ability to mark out work to specifications and to measure and check the quality of finished work including the correct use of: <ul style="list-style-type: none"> g.1. rules and tapes g.2. squares g.3. scribes g.4. dividers g.5. trammels g.6. adjustable gauge g.7. centre punch hammers g.8. callipers g.9. vernier callipers g.10. micrometer h. Ability to identify a glazed, loaded or untrue grinding wheel condition i. Procedures for dressing and/or truing a grinding wheel j. Characteristics and identifying features of common engineering drill bits k. Environmental protection measures when carrying out basic engineering tasks
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to the use and care of hand or power tools required for work tasks that may be carried out by an integrated rating on board a vessel through appropriate practical exercises and simulated situations; and/or a.2. use and care for hand or power tools required for work tasks that may be carried out by an integrated rating on an operational commercial or training vessel

Evidence Guide (continued)

USE AND CARE FOR HAND AND POWER TOOLS CARRIED ON A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.6. selecting appropriate hand and power tools to complete assigned tasks a.7. using and caring for hand and power tools a.8. ensuring the exercise of all required safety, environmental and hazard control precautions and procedures when using hand and power tools in accordance to complete assigned tasks a.9. taking appropriate action where a hand or power tool has been found to be defective or worn <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 ISM Code and associated vessel's safety management system and procedures b.2 OHS regulations and hazard prevention policies and procedures b.3 tool manufacturer's instructions b.4 established job procedures and work instructions b.5 following housekeeping processes <p>c. Action taken promptly to report incidents and problems involving the use of hand and power tools</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDM MR50 01A CARRY OUT BASIC FOOD HANDLING, PREPARATION, STOCK CONTROL AND STORAGE ON AN OFF-SHORE SUPPORT VESSEL OR RIG

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to carry out basic food handling, preparation, stock control and storage within the limits of responsibility of an integrated rating on an off-shore support vessel or oil/gas rig, including menu preparation, stock ordering and control, food handling, storage and preparation, and the fulfilment of food hygiene regulations.

ELEMENT	PERFORMANCE CRITERIA
1. Prepare menus	<ul style="list-style-type: none"> a. Requirements for catering menus are identified in terms of the eating habits, cultural needs and nutritional requirements of the crew and the catering policies and procedures of the company b. Menus are constructed to meet identified personnel requirements and budgetary allocations
2. Carry out stock control and ordering	<ul style="list-style-type: none"> a. Requirements for food and ingredients are estimated based on planned menus b. Stock is purchased, received, stored and transferred according to identified vessel / rig requirements and established procedures c. Records of purchases, invoices and other documentation related to stock control and ordering are kept in accordance with established procedures d. Effective stock control procedures are applied, including stock taking and reconciliation e. Storage areas are maintained and stock transferred according to OH & S and health regulations
3. Handle and store food and ingredients	<ul style="list-style-type: none"> a. Ensure that equipment is clean before use, is the correct type and size and is safely assembled and ready for use b. Food and ingredients are handled and stored in accordance with health regulations, OHS requirements and established procedures c. Correct lifting and transporting methods are used when handling and moving food and ingredients
4. Prepare food using basic techniques	<ul style="list-style-type: none"> a. Ingredients are identified correctly, according to standard recipes b. Ingredients of the correct quantity, type and quality and are assembled and prepared in required form and time frame c. Food is prepared according to weight, amount and/or required number of portions d. Vegetables and fruit are cleaned, peeled and/or prepared as required for menu items e. Dairy products are correctly handled and prepared as required for menu items f. Dry goods are measured, sifted where appropriate and used as required for menu items g. Meat is trimmed, minced or sliced and prepared in accordance with established procedures h. Fish and seafood is cleaned and prepared and/or filleted in accordance with established procedures i. Poultry is trimmed and prepared in accordance with established procedures j. Sandwiches, garnishes, coatings, batters and coatings and other general food items are prepared in accordance with established procedures k. Food is cooked and presented in accordance with menu, recipes, and established procedures

<p>5. Fulfil food hygiene regulations</p>	<ul style="list-style-type: none"> a. Biological, physical and chemical hazards and risks to food safety are identified in accordance with established procedures b. Critical control points in the food production system are identified and monitored c. Food is prepared to food safety specifications based on the HACCP method. d. Corrective action is taken in situations where it has been identified that hygiene regulation e. Internal and external checks and audits of food safety and hygiene procedures and precautions are undertaken in accordance with established procedures f. Appropriate records are maintained as required
<p>6. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precautions and regulations are followed when carrying out food preparation and presentation in accordance with established procedures b. Safety hazards are identified and action is taken in conjunction with others to minimise or eliminate risk to personnel, vessel, rig and the environment c. Emergency and contingency plans are followed in the event of a failure or emergency associated with rig shift and anchor handling operations

Range Of Variables

CARRY OUT BASIC FOOD HANDLING, PREPARATION, STOCK CONTROL AND STORAGE ON AN OFF-SHORE SUPPORT VESSEL OR RIG

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the Safe Working Code of Practice for the Australian Offshore Support Vessel Industry and relevant maritime and health regulations. b. Work is performed within the limits of responsibility of an integrated rating in accordance with established procedures and recipes, with some accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of basic principles and to the preparation, handling and storage of food. Following of orders and instructions of senior officers is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include a rig or a vessel servicing off-shore oil and gas rig operations b. Food to be prepared and served may include: <ul style="list-style-type: none"> b.1. hot dishes including meats, seafood and poultry b.2. hot vegetables b.3. salads b.4. fresh fruit b.5. desserts b.6. sandwiches and cold collations b.7. cake and biscuits b.8. tea coffee and cold drinks c. Critical control points in the food production system may include: <ul style="list-style-type: none"> c.1. purchasing, delivery & storage c.2. preparation and cooking c.3. cooling & storage holding or rethermalisation processes d. Hazards to food safety may include: <ul style="list-style-type: none"> d.1. bacteria d.2. moulds and yeast d.3. broken glass or metal d.4. dangerous additives d.5. chemicals d.6. natural poisons. e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. gloves, apron and boots f. Operational hazards may include: <ul style="list-style-type: none"> f.1. knives and other sharp cooking and food preparation implements f.2. unsecured cooking utensils, pots or equipment f.3. slippery or greasy deck f.4. moving and rotating kitchen equipment and machinery f.5. hot stove tops f.6. hot liquids in cooking pots and utensils f.7. poor housekeeping procedures f.8. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. food preparation specifications and recipes a.2. operating instructions provided by the manufacturers of the galley equipment a.3. vessel and company procedures for food preparation and service a.4. orders and instructions of the officer in charge of the watch a.5. relevant maritime and health regulations a.6. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.7. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable legislation and codes may include <ul style="list-style-type: none"> a.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.2. relevant sections of IMO Conventions and Codes a.3. relevant sections of AMSA Marine Orders a.4. relevant health and hygiene regulations a.5. ISM Code a.6. Marine Pollution Act (MARPOL) a.7. Petroleum (Submerged Lands) Act a.8. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

CARRY OUT BASIC FOOD HANDLING, PREPARATION, STOCK CONTROL AND STORAGE ON AN OFF-SHORE SUPPORT VESSEL OR RIG

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Prepare menus a.2. Carry out stock control and ordering of food and ingredients a.3. Handle and store food and ingredients a.4. Prepare food using basic techniques a.5. Fulfil the requirements of food hygiene regulations a.6. Follow safety and hazard control procedures during food preparation storage and service
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of an integrated rating on a support vessel or an off shore oil and/or gas rig.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of Safe Working Code of Practice for the Australian Offshore Support Vessel Industry and maritime regulations b. Relevant health, hygiene, OH&S and pollution control legislation and policies c. HACCP principles and methods of food production including recording requirements according to regulatory standards d. Microbiological hazards e. Standard operating procedures related to food preparation, handling, storage, and stock control and ordering f. Basic food products and types of menus suitable for food service on a rig or support vessel g. Logical and time efficient work flow for food preparation and service h. Principles of stock control i. Common examples of stock control documentation j. Safe lifting and handling procedures k. Basic knowledge of stock required for food service on a rig or support vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to carry out basic food handling, preparation, stock control and storage on an off-shore support vessel or rig through appropriate case studies, practical exercises and simulated situations; and/or a.2. carry out basic food handling, preparation, stock control and storage on an operational off-shore support vessel or rig
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. preparing menus a.2. carrying out stock control and ordering of food and ingredients a.3. handling and storing food and ingredients a.4. preparing food using basic techniques a.5. fulfilling the requirements of food hygiene regulations a.6. following safety and hazard control procedures during food preparation storage and service b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. sections of relevant maritime regulations b.2. relevant health and hygiene regulations b.3. ISM Code and associated vessel's Safety Management System and procedures b.4. OHS regulations and hazard prevention policies and procedures b.5. job procedures and work instructions c. Action taken promptly to report operational incidents and problems in accordance with regulations and shipboard procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

CARRY OUT BASIC FOOD HANDLING, PREPARATION, STOCK CONTROL AND STORAGE ON AN OFF-SHORE SUPPORT VESSEL OR RIG

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	1	2

TDM MR51 01A CARRY OUT WINDLASS OPERATIONS ON A RIG

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required by integrated ratings when carrying out pre-operational checks and operating the windlasses on a commercial oil and/or gas rig, including performing pre-operational checks on the windlasses; greasing the machinery; operating the windlasses when running or recovering anchors or when repositioning a rig; and exercising all required safety, environmental and hazard control precautions and procedures during the operation and routine maintenance of the windlasses.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Perform pre-operational checks on the windlass</p>	<ul style="list-style-type: none"> a. Briefing meeting is attended prior to windlass operations and information is obtained and interpreted on the proposed work program and any unusual aspects of job or hazards that may be encountered b. The condition of windlasses are checked in accordance with established procedures c. Where checks confirm operability of windlasses, appropriate action is taken to advise forthcoming shift d. Where checks reveal that machinery is not working to satisfaction or specification, the problem is reported immediately and if required, the windlass is shut down in accordance with established procedures e. Pre-shift greasing of windlasses, including fairleaders, is completed in accordance with established procedures f. Appropriate action is taken to ensure the auto greasing system has adequate grease to complete windlass operations g. Checks are made that the spline clutch is engaged prior to windlass operation
<p>2. Operate windlass</p>	<ul style="list-style-type: none"> a. Windlasses are operated for running or recovering anchors or for the repositioning of the rig in accordance with established procedures and manufacturer's specifications b. Hand held radios are maintained at hand and are used as required when operating anchor windlasses c. Operation of the windlasses is monitored in accordance with established procedures d. During windlass operations care is taken that the specific amp rating for the motor is not exceeded e. Pay out speed is monitored during windlass operations to ensure maximum rating is not exceeded f. Chain tension and load indicators are monitored to ensure operations are within equipment operating limits g. Where the machinery is found to be not working satisfactorily or to specification, the problem is reported immediately and if required, the windlass is shut down in accordance with established procedures h. In situations where a rig is being repositioned and the PCC is secured to the rig, care is taken to ensure it does not get fouled up in the chain resulting in structural damage to the rig i. Windlasses are shut down in accordance with established procedures
<p>3. Coordinate windlass operations with other vessel operations</p>	<ul style="list-style-type: none"> a. Deck operations are monitored during windlass operations to ensure crew safety. b. Lines of communication both radio and visual are established and maintained with the master and deck crew. c. All crew are kept informed of cable movements and loadings. d. Windlass operations are coordinated with vessel movements and deck operations.

4. Follow safety and hazard control procedures

- a. All required safety precautions and regulations are followed when carrying out windlass operations and basic maintenance
- b. Operational hazards are identified and action is taken in conjunction with others to minimise or eliminate risk to personnel, vessel and the environment
- c. In an emergency or safety incident, the air-operated brakes are applied, the winch is disengaged and power is removed from the winch in accordance with established emergency procedures
- d. Emergency and contingency plans are followed in the event of a failure or emergency during windlass operations

Range Of Variables

CARRY OUT WINDLASS OPERATIONS ON A RIG

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with Safe Working Code of Practice for the Australian Offshore Support Vessel Industry, relevant maritime regulations and the Petroleum (Submerged Lands) Act. b. Work is performed in accordance with established operational procedures, with some accountability and responsibility for self and others in achieving the required outcomes. It involves the application of established procedures and techniques for the operation and maintenance of the windlasses at an offshore oil and/or gas rigs when running or recovering anchors or for the repositioning of the rig. Following of orders and instructions of the Rig Captain or the officer in charge of the watch is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial off-shore oil and gas rig b. Windlass operation and pre-operational checks may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and sea b.3. when running anchors b.4. when recovering anchors b.5. when repositioning of the rig c. Windlass operations may include: <ul style="list-style-type: none"> c.1. hauling in c.2. dynamic pay out c.3. emergency pay out d. Pre-operation checks and routine maintenance activities may include: <ul style="list-style-type: none"> d.1. pre operational checks of windlass performance and condition d.2. checks that spline clutch is engaged prior to operation of a windlass d.3. identification of any deterioration of winch performance d.4. pre-shift greasing of windlasses d.5. action to ensure auto greasing system has adequate grease d.6. reporting of identified operational problems d.7. shutting down of windlasses if required as a result of out-of specification performance e. Pre-operational precautions include: <ul style="list-style-type: none"> e.1. attendance at briefing meeting on windlass operations e.2. checks that the chain locker seals are open prior to operating the winch to prevent damage to the seals e.3. checks that the spline clutch is engaged prior to windlass operation e.4. confirmation that hand held radios are operational and communications is established prior to and during windlass operations f. Operational hazards may include: <ul style="list-style-type: none"> f.1. noise f.2. speed of pay out f.3. moving heavy loads using unsafe lifting procedures f.4. unsecured machinery, components or equipment f.5. ropes, wires and cables f.6. slippery deck f.7. sharp tools and implements f.8. moving and rotating machinery f.9. faulty machinery equipment handling equipment and lifting gear f.10. using equipment beyond safe working limits f.11. poor housekeeping procedures f.12. non-compliance with safe working procedures g. Personal protective equipment may include: <ul style="list-style-type: none"> g.1. ear muffs/plugs and goggles g.2. gloves g.3. life jacket g.4. overalls g.5. steel capped boots g.6. sun glasses and sun hat g.7. vests g.8. wet weather gear

Range Of Variables (continued)

CARRY OUT WINDLASS OPERATIONS ON A RIG

VARIABLE	SCOPE
<p>3. Sources of information / documents</p>	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.2. ISM Code safety management system plans, procedures, checklists and instructions a.3. relevant IMO Conventions and Codes a.4. AMSA Marine Orders a.5. operational orders and instructions a.6. manufacturer's manuals and specifications a.7. material safety data sheets a.8. rig and company procedures a.9. instructions of relevant Maritime Authorities
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable legislation and codes may include</p> <ul style="list-style-type: none"> a.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.2. relevant sections of IMO Conventions and Codes a.3. relevant sections of AMSA Marine Orders a.4. ISM Code a.5. Marine Pollution Act (MARPOL) a.6. Petroleum (Submerged Lands) Act a.7. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

CARRY OUT WINDLASS OPERATIONS ON A RIG

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Perform pre-operational checks on windlasses a.2. Carry out pre-operational precautions a.3. Grease windlass machinery prior to operation a.4. Operate windlasses for the running of anchors, when recovering anchors and when repositioning the rig a.5. Coordinate windlass operations with other vessel operations a.6. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures during windlass operations a.7. Communicate effectively with others during windlass operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other competency units that form part of a job role of an integrated rating on a support vessel or an off-shore oil and/or gas rig</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of Safe Working Code of Practice for the Australian Offshore Support Vessel Industry and relevant maritime regulations b. ISM Code safety management system plans, procedures, checklists and instructions as they relate to the operation and maintenance of the windlasses on an off-shore oil and/or gas rig c. Relevant OH&S and pollution control legislation and policies d. Procedures for the pre-operational checks and operation of the windlasses on an off-shore oil and/or gas rig e. Basic maintenance procedures for windlasses on a rig f. Precautions to be taken prior to operating a windlass on a rig, including: <ul style="list-style-type: none"> f.1. attendance at briefing meeting on windlass operations f.2. checking that the chain locker seals are open prior to operating the winch to prevent damage to the seals f.3. ensuring that the spline clutch is engaged prior to windlass operation f.4. ensuring that hand held radios are operational and communications is established prior to and during windlass operations g. Operating characteristics and features of windlasses used when servicing an off-shore oil and/or gas rig h. Established procedures for using windlasses on a rig i. Procedures for identifying and reporting of faulty or out-of-specification operation of windlasses j. Rig mooring procedures k. Hazards and related safety precautions when operating and maintaining windlasses, including: <ul style="list-style-type: none"> k.1. excessive pay out speed k.2. excessive chain tension k.3. noise k.4. fouling of chain by the PCC during the repositioning of a rig l. Communication equipment and techniques required during winch operations including hand held radios
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to carry out and pre-operational checks and operate windlasses on an oil or gas rig through appropriate case studies and practical exercises; and/or a.2. carry out supervised pre-operational checks and operate windlasses on operational off-shore oil and/or gas rig

Evidence Guide (continued)

CARRY OUT WINDLASS OPERATIONS ON A RIG

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. performing pre-operational checks on windlasses a.2. operating windlasses for the running of anchors, when recovering anchors and when repositioning the rig a.3. exercising all required safety, environmental and hazard control precautions and procedures during windlass operations a.4. communicating effectively with others during windlass operations b. Shows evidence of application of relevant workplace procedures, including: <ul style="list-style-type: none"> b.1. with Safe Working Code of Practice for the Australian Offshore Support Vessel Industry b.2. sections of relevant maritime regulations dealing with windlass operations on a rig b.3. ISM Code and associated vessel's Safety Management System and procedures b.4. OHS regulations and hazard prevention policies and procedures b.5. job procedures and work instructions b.6. windlass manufacturer's operating and maintenance specifications and instructions b.7. following shipboard housekeeping processes c. Action taken promptly to report operational incidents and problems in accordance with regulations and shipboard procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2	3

TDM MR52 01A CARRY OUT DOGGING AND CARGO HANDLING OPERATIONS AT A RIG

Field MF Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to carry out the duties of an integrated rating during dogging and cargo handling operations on board a commercial support vessel at an off-shore oil or gas rig, including carrying out hatch cover operations, cleaning and preparing cargo spaces, assisting in cargo handling operations, lashing cargo, and carrying out dogging functions.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Establish communications for dogging operations</p>	<ul style="list-style-type: none"> a. Methods of communication are agreed with relevant personnel b. Agreed signals / communications for load moving conform to Australian Standards and codes of practice c. Communications are trialed and adjusted and/or confirmed as required to ensure a safe and effective lift d. Communications equipment are checked for correct operation and configured in line with legislative and company requirements e. Defective communications equipment is tagged, rejected and reported to authorised personnel for corrective action f. Signals / communications are given both within sight and out of sight of crane operator
<p>2. Carry out dogging operations</p>	<ul style="list-style-type: none"> a. Lifting gear is checked and defective gear is isolated and reported in accordance with established procedures b. Common whipping, bends, hitches and splices in fibre rope are made as required as part of dogging operations carried out by integrated ratings on a supply vessel at a rig c. The weight of the load is assessed in accordance with established procedures d. Safe Working Loads of slings in various configurations are correctly calculated in accordance with established procedures e. Appropriate ropes, slings, chains and accessories are selected and used for load shifting in accordance with established procedures f. Loads of various weights and sizes are slung during cargo handling operations in accordance with established procedures g. Appropriate directions are given to a crane operator to move a load, when the load is not in the operators view h. All hand signals and whistle signals for directing load movement are given in accordance with established communication protocols
<p>3. Assist in cargo handling operations at a rig</p>	<ul style="list-style-type: none"> a. Assistance is provided in the handling of cargo during loading and unloading operations at a rig in accordance with established procedures and under the supervision of the responsible officer b. Appropriate precautions are taken during cargo handling to avoid accidents and cargo damage c. Damaged cargo or faulty or defective cargo handling gear and equipment is identified, marked and reported to the responsible officer
<p>4. Carry out hatch cover operations</p>	<ul style="list-style-type: none"> a. Assistance is provided in hatch opening and closing operations in accordance with established procedures and under the supervision of the responsible officer b. Checks and routine maintenance on hatch securing and opening devices and machinery are carried out in accordance with established procedures and under the supervision of the responsible officer c. Assistance is provided in securing hatch covers for sea in accordance with established procedures and under the supervision of the responsible officer

5. Clean and prepare cargo spaces	<ul style="list-style-type: none"> a. Assistance is provided in cleaning and preparation of a cargo space in accordance with established procedures and under the supervision of the responsible officer b. Assistance is provided in the opening, checking, cleaning and sealing of a bilge and the dismantling of a strum box
6. Lash cargo	<ul style="list-style-type: none"> a. Assistance is provided in the lashing of cargo in accordance with established procedures and under the supervision of the responsible officer b. Appropriate precautions are taken during cargo lashing procedures to avoid cargo damage c. Faulty and defective lashing and securing gear and equipment is identified, marked and reported to the responsible officer
7. Follow safety and hazard control procedures	<ul style="list-style-type: none"> a. All required safety precautions and regulations are followed when carrying out cargo handling and dogging operations b. Operational hazards are identified and action is taken in conjunction with the officers, engineers and other members of the crew to minimise or eliminate risk to personnel, vessel and the environment c. Agreed signals / communications for load moving as per Australian Standards and codes of practice are used during dogging operations d. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed, including obtaining the authority and approval of the relevant officer e. Shipboard emergency and contingency plans are followed in the event of a failure or emergency during cargo handling and dogging operations

Range Of Variables

CARRY OUT DOGGING AND CARGO HANDLING OPERATIONS AT A RIG

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the Safe Working Code of Practice for the Australian Offshore Support Vessel Industry and other relevant maritime codes and regulatory requirements. b. Work is performed as an integrated rating under the supervision of the responsible officers. It involves the application of established procedures and techniques to the cargo handling and dogging tasks falling within the limits of responsibility of an integrated rating on a support vessel during cargo handling operations at a rig. Following of orders and instructions of the officer in charge of the watch is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel supporting off-shore oil and gas rig operations b. Cargo handling and dogging operations may be carried: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while moored or at anchor c. Cargo may include: <ul style="list-style-type: none"> c.1. general cargo stored in a cargo space or on a hatch c.2. deck cargo c.3. cargo containers c.4. equipment and stores c.5. bulk cargo d. Agreed signals / communications for load moving conform to Australian Standards and codes of practice and include: <ul style="list-style-type: none"> d.1. stop d.2. raise d.3. lower d.4. slew – left or right d.5. luff – boom up and down e. Communications may occur through: <ul style="list-style-type: none"> e.1. hand signals e.2. whistles e.3. hand held radio f. Calculations required during dogging and load shifting operations may include: addition, subtraction, multiplication and division, fractions, decimals, percentages and mixed numbers g. Personal protective equipment may include: <ul style="list-style-type: none"> g.1. ear muffs/plugs and goggles g.2. gloves g.3. life jacket g.4. overalls g.5. steel capped boots g.6. sun glasses and sun hat g.7. vests g.8. wet weather gear h. Operational hazards for cargo handling and dogging operations may include: <ul style="list-style-type: none"> h.1. moving heavy loads using unsafe lifting procedures h.2. cargo handling operations in rough seas or bad weather h.3. unsecured cargo, deck machinery, components or equipment h.4. slippery deck h.5. moving and rotating machinery h.6. faulty lifting / lashing gear and equipment h.7. using equipment and lifting gear beyond safe working limits h.8. poor housekeeping procedures h.9. working in confined spaces h.10. non-compliance with safe working procedures
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.2. ISM Code safety management system plans, procedures, checklists and instructions a.3. Safe working Code of Practice for the Australian Offshore Support Vessel Industry a.4. orders and instructions of the officer in charge of the watch a.5. vessel, rig and company procedures

Range Of Variables

CARRY OUT DOGGING AND CARGO HANDLING OPERATIONS AT A RIG

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.2. relevant sections of IMO Conventions and Codes a.3. relevant sections of AMSA Marine Orders a.4. Safe working Code of Practice for the Australian Offshore Support Vessel Industry a.5. ISM Code a.6. relevant international, Australian and State/Territory OH&S and pollution control legislation

Evidence Guide

CARRY OUT DOGGING AND CARGO HANDLING OPERATIONS AT A RIG

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Carry out cargo handling operations within the limits of responsibility of an integrated rating a.2. Carry out dogging operations on a support vessel at a rig a.3. Carry out hatch cover operations a.4. Clean and prepare cargo spaces a.5. Lash cargo a.6. Apply all required safety, environmental and hazard control precautions and procedures during cargo handling and dogging operations at a rig a.7. Communicate effectively with others during cargo handling and dogging operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial support vessel at an off-shore oil or gas rig.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry and other relevant maritime codes and regulatory requirements b. Relevant OH&S and pollution control legislation and policies c. Functions and responsibilities of an integrated rating during cargo handling operations on a support vessel at a rig d. Cargo handling and dogging procedures within the limits of responsibility of an integrated rating, including: <ul style="list-style-type: none"> d.1. carrying out hatch cover operations d.2. cleaning and preparing cargo spaces d.3. lashing and securing of various types of cargo d.4. dogging operations e. Agreed signals / communications for load moving as per Australian Standards and codes of practice f. Calculations required during dogging and load shifting operations may include: addition, subtraction, multiplication and division, fractions, decimals, percentages and mixed numbers g. Ways of estimating the weight of a load and methods of calculating the safe working load of cranes and load lifting equipment h. Slings and lifting gear used during cargo handling and dogging operations at a rig and their applications i. Techniques and precautions required when lashing various types of cargo carried on support vessels servicing off-shore oil / gas rigs j. Hazards and related safety precautions when carrying out cargo handling and dogging operations at a rig k. Faults and damage that may occur with lifting gear and action to be taken when they are identified l. Basic environmental protection measures during cargo handling and dogging operations m. Personal protection clothing and equipment and its purpose n. Communication techniques and equipment used during cargo and dogging operations on board a support vessel at a rig
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to carry out routine cargo handling and dogging tasks on board a support vessel at a rig through appropriate case studies, practical exercises and simulated situations; and/or a.2. assist in routine cargo handling and dogging tasks on board an operational commercial support vessel at a rig

Evidence Guide (continued)

CARRY OUT DOGGING AND CARGO HANDLING OPERATIONS AT A RIG

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.8. carrying out cargo handling operations within the limits of responsibility of an integrated rating a.9. carrying out dogging operations a.10. carrying out hatch cover operations, a.11. cleaning and prepare cargo spaces a.12. lashing cargo a.13. applying all required safety, environmental and hazard control precautions and procedures during cargo handling and dogging operations a.14. communicating effectively with others during cargo handling and dogging operations b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. Relevant sections of the Safe Working Code of Practice for the Australian Offshore Support Vessel Industry b.2. ISM Code and associated vessel's Safety Management System and procedures b.3. agreed signals / communications for load moving as per Australian Standards and codes of practice b.4. OHS regulations and hazard prevention policies and procedures b.5. job procedures and work instructions b.6. instructions and orders of officers on the vessel / rig c. Action taken promptly to report operational incidents and problems in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	1	1	2

TDM MR53 01A CARRY OUT ANCHOR HANDLING, TOWAGE AND SUPPLY DUTIES AT A RIG

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required by an integrated rating to carry out a range of anchor handling, towage and supply duties at an off-shore oil or gas rig under the direction of the Chief Officer or Master and in accordance with the "Safe working Code of Practice for the Australian Offshore Support Vessel Industry", including preparing for and concluding anchor handling deck operations; perform deck duties during anchor running / retrieval operations; and performing a range of supply duties while at a rig.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Prepare for anchor handling operations</p>	<p>a. Pre- anchor handling duties are carried out in accordance with established procedures within the limits of responsibility of an integrated rating and under the direction of the officer in charge</p> <p>b. Briefing meeting is attended prior to anchor handling operations and information is obtained and interpreted on the proposed work program and any unusual aspects of job or hazards that may be encountered</p> <p>c. The deck is cleared of all unnecessary materials and prepared for operations</p> <p>d. Deck area in contact with work / tow wire is made free from dents, scores, jags and deformations</p> <p>e. Required tools and equipment are checked to ensure they are operational and brought on deck in preparation for operations</p> <p>f. Prior to anchor handling activities, checks are made that all personnel other than those engaged in anchor handling tasks are cleared from the deck</p>
<p>2. Perform deck duties during anchor running/ retrieval operations using the permanent chain chaser system</p>	<p>a. The tugger winch is operated in accordance with established procedures within the limits of responsibility of an integrated rating and under the direction of the officer in charge</p> <p>b. The chaser pennant is received from the rig and connected to the work wire</p> <p>c. The wire securing system is operated in accordance with established procedures and under the direction of the officer in charge</p> <p>d. Chaser pennant is returned to the rig</p> <p>e. The storage winch is operated in accordance with established procedures</p>
<p>3. Perform deck duties during anchor retrieval operations using the pennant and buoy system</p>	<p>a. Buoy is brought on board in accordance with established procedures within the limits of responsibility of an integrated rating and under the direction of the officer in charge</p> <p>b. Surface pennant is connected to work wire</p> <p>c. Work wire is disconnected in accordance with established procedures and under the direction of the officer in charge</p> <p>d. Transfer buoy pennant wires from work winch to the storage drums and under the direction of the officer in charge</p>
<p>4. Perform deck duties during anchor running operations using the pennant and buoy system</p>	<p>a. Pennant wires are transferred from storage winch to work winch</p> <p>b. The buoy is deployed in accordance with established procedures within the limits of responsibility of an integrated rating and under the direction of the officer in charge</p>

<p>5. Conclude anchor handling operations</p>	<ul style="list-style-type: none"> a. Post anchor handling duties are carried out in accordance with established procedures within the limits of responsibility of an integrated rating and under the direction of the officer in charge b. At the conclusion of operations, tools and equipment are inspected for damage and maintained in good working order c. All tools and equipment are cleared from the deck and correctly stowed in preparation for future operations d. Input is provided at operational de-briefing meetings after anchor handling operations to identify problems or other issues requiring attention e. Appropriate action is taken on problems or issues identified during anchor handling operations in accordance with the limits of responsibility of an integrated rating
<p>6. Perform rig towage duties</p>	<ul style="list-style-type: none"> a. The tow is connected in accordance with established procedures within the limits of responsibility of an integrated rating b. During tow, winches are manned and operated in accordance with the Master's directions c. During tow, directions of the Master are followed at all times d. The tow is disconnected in accordance with established procedures within the limits of responsibility of an integrated rating
<p>7. Perform supply duties</p>	<ul style="list-style-type: none"> a. Supply duties at a rig are carried out in accordance with established procedures within the limits of responsibility of an integrated rating
<p>8. Follow safety and hazard control procedures</p>	<ul style="list-style-type: none"> a. All required safety precautions and regulations are followed when carrying in accordance with established procedures within the limits of responsibility of an integrated rating b. Operational hazards are identified and action is taken in conjunction with others to minimise or eliminate risk to personnel, vessel, rig and the environment c. Work safety meetings are attended and all operational and safety instructions are clarified prior to the commencement of operations d. Verbal / non verbal means of communication are clarified and used in a clear and appropriate manner e. Appropriate techniques are used to manage fatigue in the workplace f. Electronic methods of communication are used as required in accordance with established procedures within the limits of responsibility of an integrated rating g. Emergency and contingency plans are followed in the event of a failure or emergency associated with rig shift and anchor handling operations

Range Of Variables

CARRY OUT ANCHOR HANDLING, TOWAGE AND SUPPLY DUTIES AT A RIG

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the Safe Working Code of Practice for the Australian Offshore Support Vessel Industry and other relevant maritime codes and regulatory requirements. b. Work is performed under the direction of the officer in charge as an integrated rating within a team carrying out anchor handling, towage and supply duties at an off-shore oil and/or gas rig. It involves the application of established shipboard procedures and techniques across a variety of operational contexts. Following of orders and instructions of the officer in charge of the watch is required..
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial an oil and gas rig, or vessel supporting off-shore oil and gas rig operations b. Anchor handling, towage and supply duties may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible weather and sea conditions c. Duties of an integrated rating during anchor running / retrieval operations using the permanent chain chaser system are performed under the direction of the officer in charge and include: <ul style="list-style-type: none"> c.1. connecting tugger wire to the work wire and using it to run the work wire along the deck to the shark jaws c.2. connecting tugger wire to the chaser pennant c.3. receiving the chaser pennant from the rig crane and directing it over the shark jaws until the eye of the pennant is forward of the jaws c.4. securing the chaser pennant in the shark jaws with locking pins and disconnecting the crane hook and tugger wire c.5. connecting the work wire to the chaser pennant and removing locking pins from the shark jaws c.6. positioning the chaser pennant over the shark jaws, and clamping and securing it with locking pins. c.7. disconnecting the work wire from the chaser pennant. c.8. connecting the tugger wire to the chaser pennant and taking up the weight of the chaser pennant c.9. connecting the chaser pennant to the crane hook. c.10. clearing the deck of personnel and loose tools and equipment during connecting and disconnecting operations c.11. paying out the tugger until slack and then disconnecting from the chaser pennant. c.12. stowing tools and equipment or prepare them for the next anchor operation. d. Duties of an integrated rating during anchor retrieval operations using the pennant and buoy system are performed under the direction of the officer in charge and include: <ul style="list-style-type: none"> d.1. connecting tugger wire to the work wire and using it to run the work wire along the deck to the shark jaws d.2. connecting the buoy catcher lasso to the work wire, (or the tugger wire if appropriate) d.3. lassoing the buoy and signalling the winch driver to bring the buoy onto the deck so as to trap the surface pennant in the shark jaws d.4. securing the surface pennant in the shark jaws with locking pins d.5. disconnecting the buoy from the surface pennant and stowing it securely d.6. connecting the work wire to the surface pennant and removing locking pins from the shark jaws d.7. clearing the deck personnel and loose tools and equipment during connecting and disconnecting operations d.8. recording pennant numbers and lengths as they come on board (if required) d.9. transferring the buoy pennant wires from work winch to the storage drums e. Duties of an integrated rating during anchor running operations using the pennant and buoy system are performed under the direction of the officer in charge include: <ul style="list-style-type: none"> e.1. delivering the first buoy pennant to the work winch and connected to the work wire e.2. coordinating the spooling onto the work winch with the work winch operator, ensuring that the correct number of pennants are transferred e.3. connecting the tugger wire to the work wire and using it to run the work wire along the deck to the shark jaws e.4. clearing the deck of personnel and loose tools and equipment during connecting and disconnecting operations e.5. preparing the buoy and positioning it on deck for deployment e.6. securing the surface pennant in the shark jaws with locking pins and disconnecting the work wire e.7. connecting the buoy to the surface pennant and removing the locking pins from the shark jaws

Range Of Variables (continued)

CARRY OUT ANCHOR HANDLING, TOWAGE AND SUPPLY DUTIES AT A RIG

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>f. Duties of an integrated rating during towage duties using the bridle system are performed under the direction of the officer in charge and include:</p> <ul style="list-style-type: none"> f.1. connecting the tugger wire to the tow wire and using it to run the tow wire along the deck, (through the towing pod if applicable) to the shark jaws f.2. connecting the towing spring to the tow wire when applicable f.3. connecting the tugger wire to the bridle/ fore pennant, lowered from the rig f.4. receiving the bridle/ fore pennant is received from the rig and directing it over the shark jaws until the eye of the bridle/ fore pennant is immediately forward of the jaws f.5. securing the bridle/ fore pennant in the shark jaws with locking pins and the crane hook and tugger wire are disconnected f.6. connecting the tow wire, (towing spring if used) to the bridle/ fore pennant f.7. where applicable, raising the retractable guide pins to restrict sideways movement of the tow wire f.8. fitting the anti-chaffing device in accordance with towing requirements and instructions f.9. clearing the deck of personnel and loose tools and equipment and removing locking pins from the shark jaws f.10. hoisting navigational shapes or lights as required f.11. maintaining watch over tow line and other equipment throughout the tow to ensure the tow wire integrity is maintained <p>g. Tools and equipment required for anchor handling, towage and supply duties include but are not restricted to:</p> <ul style="list-style-type: none"> g.1. A-frame, anchors g.2. bolster, bridle, Bruce anchor g.3. camlock, chaffers (Scotchman), crown chain, Cyclops g.4. D-shackle, day shapes, dolly g.5. fuse link g.6. jewellery g.7. gob plate, gob wire g.8. hinge link g.9. j-hook, jaws g.10. lasso g.11. monkey face g.12. pawl, pelican hook, pelican hook, pennant, permanent chain chaser (PCC), piggy back, pigtail g.13. roller, g.14. safety hook, screens, shark's jaws, Stevin anchor, stretch section, stringer, sub-sea buoy g.15. towing pins, towing sleeve, towing spring, tuggers g.16. winches <p>h. Personal protection clothing and equipment may include:</p> <ul style="list-style-type: none"> h.1. ear muffs/plugs and gloves h.2. goggles h.3. life jacket h.4. overalls and vests h.5. steel capped boots h.6. sun glasses and sun hat h.7. wet weather gear <p>i. Operational hazards may include:</p> <ul style="list-style-type: none"> i.1. moving heavy loads using unsafe lifting procedures i.2. unsecured machinery, components or equipment i.3. slippery deck i.4. ropes and wires i.5. sharp tools and implements i.6. moving and rotating equipment and machinery i.7. faulty machinery equipment handling equipment and lifting gear i.8. using equipment beyond safe working limits i.9. poor housekeeping procedures i.10. non-compliance with safe working procedures

Range Of Variables (continued)

CARRY OUT ANCHOR HANDLING, TOWAGE AND SUPPLY DUTIES AT A RIG

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> j. Fatigue management strategies may include: <ul style="list-style-type: none"> j.1. recognition of symptoms of fatigue j.2. arranging to take a break when symptoms of fatigue are identified j.3. maintenance of personal fitness and health j.4. appropriate dietary habits j.5. avoidance of excessive consumption of alcohol prior to duties j.6. following statutory requirements related to hours of rest
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.2. ISM Code safety management system plans, procedures, checklists and instructions a.1. relevant IMO Conventions and Codes a.3. AMSA Marine Orders a.4. orders and instructions of the officer on watch a.5. vessel and company procedures a.6. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable legislation and codes may include <ul style="list-style-type: none"> a.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry a.2. relevant sections of IMO Conventions and Codes a.3. relevant sections of AMSA Marine Orders a.4. ISM Code a.5. Marine Pollution Act (MARPOL) a.6. Petroleum (Submerged Lands) Act a.7. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

CARRY OUT ANCHOR HANDLING, TOWAGE AND SUPPLY DUTIES AT A RIG

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Prepare for and conclude anchor handling and towage operations on board a rig supply vessel a.2. Perform duties of an integrated rating during: <ul style="list-style-type: none"> a.2.1. anchor running/ retrieval operations using the permanent chain chaser system a.2.2. anchor running/ retrieval operations using the pennant and buoy system a.3. Perform duties of an integrated rating during towage operations at a rig a.4. Perform duties of an integrated rating during supply operations at a rig a.5. Ensure the exercise of all required safety, environmental and hazard control precautions and procedures during anchor handling, towage and supply operations at a rig a.6. Communicate effectively with others during anchor handling, towage and supply operations at a rig
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of an integrated rating on a support vessel and/or an off shore oil and gas rig.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of the Safe Working Code of Practice for the Australian Offshore Support Vessel Industry and other relevant maritime regulations, as they relate to the responsibilities of integrated rating during anchor handling, towage and supply operations at a rig b. Relevant OH&S and pollution control legislation and policies c. Functions and responsibilities of integrated ratings during anchor handling, towage and supply operations d. Procedures for carrying out anchor handling, towage and supply operations at an off-shore oil and/or gas rig within the limits of responsibility of an integrated rating e. Typical hazards and related safety precautions when carrying out anchor handling, towage and supply operations f. Requirements for personal protection clothing and equipment and its use when carrying out anchor handling, towage and supply operations g. Personal protection clothing and equipment and its purpose h. Signs of fatigue i. Fatigue management principles and techniques including statutory requirements on hours of rest j. Basic environmental protection measures k. Communication techniques used during anchor handling, towage and supply operations
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to carry out routine integrated rating tasks during anchor handling, towage and supply operations on board a rig or supply vessel through appropriate case studies, practical exercises and simulated situations; and/or a.2. carry out routine integrated rating tasks during anchor handling, towage and supply operations on an operational support vessel or rig
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. preparing for and concluding anchor handling, towage and supply operations a.2. performing duties of an integrated rating during anchor handling, towage and supply operations a.3. exercising all required safety, environmental and hazard control precautions and procedures during anchor handling, towage and supply operations at a rig a.4. communicating effectively with others during anchor handling, towage and supply operations at a rig b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. Safe Working Code of Practice for the Australian Offshore Support Vessel Industry b.2. sections of relevant maritime regulations b.3. ISM Code and associated vessel's Safety Management System and procedures b.4. OHS regulations and hazard prevention policies and procedures b.5. job procedures and work instructions c. Action taken promptly to report operational incidents and problems in accordance with regulations and shipboard procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

CARRY OUT ANCHOR HANDLING, TOWAGE AND SUPPLY DUTIES AT A RIG

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	3	1	2	2

TDM MU1 01A MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

Field U Environment

DESCRIPTION:

This unit involves the skills and knowledge required to monitor compliance with international and Australian legislative requirements and measures to ensure the protection of the marine environment, including coordination of preventative and precautionary procedures, observing compliance, remedying non-compliance and maintaining relevant certification.

The unit is consistent with the related functional standards in Sections A II/2 and A III/2 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manage compliance with legislative requirements for protection of the marine environment</p>	<p>a. Relevant legislative and company requirements for the protection of the marine environment are identified for the size and type of vessel concerned</p> <p>b. Appropriate measures are established and applied to prevent pollution of the marine environment in accordance with regulations and procedures</p> <p>c. Officers and crew are provided with necessary information and training to ensure compliance with regulations and procedures for the protection of the marine environment</p> <p>d. Compliance with legislative regulations and company procedures for the protection of the marine environment is monitored, and required action is taken where incidences of non-compliance are identified</p> <p>e. Any breach of regulations and procedures concerning protection of the marine environment and associated action taken in accordance with regulatory requirements and procedures are reported as required</p>
<p>2. Manage the validity of certification of shipboard items and equipment</p>	<p>a. Where relevant, the currency and validity of certificates and other documents required by Australian and/or international legislation and conventions for the protection of the marine environment are monitored and appropriate plans for their renewal and extension are developed and implemented</p> <p>b. Where relevant, the condition and operation of surveyed items and equipment are checked and appropriate action is taken to ensure continued validity of all certification relevant to the protection of the marine environment</p>
<p>3. Maintain documentation related to legislative requirements for the protection of the marine environment</p>	<p>a. Requirements for reports and other documentation related to the protection of the marine environment and any breaches of Australian and international regulations and codes are identified and interpreted</p> <p>b. All required documentation related to the protection of the marine environment and any breaches of Australian and/or international regulations and codes is completed in accordance with regulations and company requirements</p>

Range Of Variables

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations concerning protection of the marine environment. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of regulations and measures to ensure the protection of the marine environment in a wide variety of operational contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Dangers to the marine environment may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while moored or at anchor c. Items and equipment surveyed under certification to protect the marine environment may include: <ul style="list-style-type: none"> c.1. pumps c.2. valves c.3. emission control equipment c.4. water management equipment including: cooling water, ballast water and bilge systems c.5. waste storage and recycling equipment c.6. ballast management equipment d. Measures to protect the marine environment may include:: <ul style="list-style-type: none"> d.1. prevention of spillages of cargo d.2. prevention of spillages of fuel and oil d.3. control of polluting emissions of gas and smoke d.4. effective management of waste, pollution and recycling processes d.5. effective management of ballast operations d.6. shipboard housekeeping d.7. pollution control instructions
3. Sources of information / documents	<ul style="list-style-type: none"> a. Documentation / records may include <ul style="list-style-type: none"> a.1. operational orders a.2. relevant regulations for the type of vessel involved a.3. company procedures related to the protection of the marine environment a.4. equipment manufacturer's instructions and recommended procedures a.5. instructions of relevant Maritime Authorities a.6. vessel's log where relevant a.7. certificates and other documents required by regulations for the protection of the marine environment a.8. relevant standards related to the protection of the marine environment
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Dependent on the size and range of service of the vessel, applicable procedures and codes may include <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to protection of the marine environment a.2. relevant sections of AMSA Marine Orders related to protection of the marine environment a.3. relevant sections of the Australian USL Code related to protection of the marine environment a.4. MARPOL Convention a.5. relevant international, Australian and/or State/Territory legislation related to protection of the marine environment

Evidence Guide

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Maintain compliance with legislative requirements for protection of the marine environment a.2. Maintain currency and validity of all required certification and documentation concerning protection of the marine environment a.3. Identify typical pollution control problems and take appropriate action a.4. Communicate effectively with others concerning measures to protect the marine environment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of a master, engineer or marine engine driver on a commercial vessel with responsibilities for ensuring compliance with pollution control measures.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant legislation and policies to protect the marine environment b. Effects on the marine environment of various possible pollution incidents c. Typical pollution control problems and related measures to protect the marine environment d. Certificates and other documents required by relevant Australian and/or international legislation and conventions for the protection of the marine environment e. Maritime communication techniques and processes for maintaining currency and validity of surveyed items and equipment f. Features and operational characteristics of emission control equipment typically used on vessels of various types g. Operational requirements of water, bilge, waste, pollution and recycling management processes on vessels as appropriate h. Regulations for reporting incidents related to breaches of the statutory codes and measures for the protection of the marine environment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably-simulated activities aimed at the protection of the marine environment covering a range of situations typically experienced on a vessel and/or b. contribute to measures to protect the marine environment on a vessel in an appropriate range of situations, weather and loading conditions
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 completing activities aimed at compliance with legislative requirements for protection of the marine environment a.2 identifying and evaluating problems related to the aimed at compliance with legislative requirements for environmental protection and determining an appropriate courses of action a.3 identifying and implementing improvements to environmental protection measures a.4 assessing compliance of vessel with legislative requirements for protection of the marine environment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Relevant regulatory requirements dealing with environmental protection b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions related to environmental protection b.4 following on-board housekeeping processes b.5 waste, pollution and recycling management processes, where relevant c. Action is taken promptly to report and/or rectify breaches of environmental protection regulations and conventions in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

MONITOR COMPLIANCE WITH LEGISLATIVE REQUIREMENTS AND MEASURES TO ENSURE PROTECTION OF THE ENVIRONMENT

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2

TDM MU4 01A ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

Field U Environment

DESCRIPTION:

This unit involves the skills and knowledge required to ensure compliance with international and Australian legislative requirements and measures to ensure the protection of the marine environment, including preventative and precautionary procedures, checking of compliance and remedying non-compliance.

The unit is consistent with the related functional standard in Sections A II/2 and AIII/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2 and Appendix 3, and relevant sections of the Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Maintain compliance with legislative requirements for protection of the marine environment</p>	<p>a. Relevant regulations and procedures for the protection of the marine environment are identified</p> <p>b. Appropriate action is taken in day-to-day work to ensure compliance with relevant regulations and procedures for the protection of the marine environment as required</p> <p>c. Appropriate action is taken where incidences of non-compliance or potential non-compliance are identified in accordance with regulations and procedures</p> <p>d. Any breach of regulations and procedures concerning protection of the marine environment is rectified and/or reported as required within the limits of the officer's responsibility</p>
<p>2. Implement anti-pollution procedures</p>	<p>a. Anti-pollution procedures applicable to vessel operations are followed in the course of day-to-day work</p> <p>b. Appropriate preventative measures are implemented to prevent pollution of the marine environment in accordance with regulations and procedures</p>
<p>3. Maintain documentation related to legislative requirements for the protection of the environment</p>	<p>a. Requirements for reports and other documentation related to the protection of the marine environment and any breaches of relevant regulations are identified and interpreted as required</p> <p>b. All required documentation related to the protection of the marine environment and any breaches of environmental regulations is completed in accordance with regulations and procedures</p>

Range Of Variables

ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

VARIABLE	SCOPE
1. General context	<p>a. Work must be carried out in compliance with the relevant Work must be carried out in compliance with mandatory rules and regulations concerning protection of the marine environment.</p> <p>b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of regulations and measures to ensure the protection of the marine environment in a wide variety of operational contexts.</p>
2. Worksite environment	<p>a. Vessel may include any Australian or international commercial vessel</p> <p>b. Dangers to the marine environment may occur:</p> <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while moored or at anchor b.7. during loading and unloading operations b.8. during maintenance operations <p>c. Items and equipment which may be checked as part of anti-pollution measures include:</p> <ul style="list-style-type: none"> c.1. pumps c.2. valves c.3. emission control equipment c.4. water management equipment including: cooling water, ballast water and bilge systems c.5. waste storage and recycling equipment c.6. ballast management equipment <p>d. Preventative measures to protect the marine environment may include::</p> <ul style="list-style-type: none"> d.1. prevention of spillages of cargo d.2. prevention of spillages of fuel and oil d.3. control of polluting emissions of gas and smoke d.4. effective management of waste, pollution and recycling processes d.5. effective management of ballast operations d.6. shipboard housekeeping d.7. pollution control instructions
3. Sources of information / documents	<p>a. Documentation / records may include</p> <ul style="list-style-type: none"> a.1. operational orders a.2. relevant regulations for the type of vessel involved a.3. company procedures related to the protection of the marine environment a.4. equipment manufacturer's instructions and recommended procedures a.5. instructions of relevant Maritime Authorities a.6. vessel's log where relevant a.7. certificates and other documents required by regulations for the protection of the marine environment a.8. relevant standards related to the protection of the marine environment
4. Applicable International, Australian and State/Territory regulations and legislation	<p>a. Dependent on the type, size and range of service of the vessel, applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to protection of the marine environment a.2. relevant sections of AMSA Marine Orders related to protection of the marine environment a.3. the Australian USL Code related to protection of the marine environment a.4. MARPOL Convention a.5. relevant international, Australian and/or State/Territory legislation related to protection of the marine environment

Evidence Guide

ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Maintain compliance with legislative requirements for protection of the marine environment a.2. Implement preventative and remedial anti-pollution procedures as per relevant regulations and procedures a.3. Identify typical pollution control problems and take appropriate action a.4. Maintain all records concerning anti-pollution measures and breaches of anti-pollution regulations a.5. Communicate effectively with others concerning measures to protect the marine environment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of a master, engineer or marine engine driver on a commercial vessel with responsibilities for ensuring compliance with pollution control measures.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant legislation, codes of practice, policies and procedures to protect the marine environment b. Effects on the marine environment of various possible pollution incidents c. Pollution control problems and related measures to protect the marine environment d. Certificates and other documents required by relevant Australian and/or international legislation and conventions for the protection of the marine environment e. Operational characteristics of emission control equipment typically used on various types and sizes of vessels f. Operational requirements of water, bilge, waste, pollution and recycling management processes used on various types and sizes of vessels g. Requirements under Australian and/or international legislation and conventions for reporting incidents related to breaches of the statutory codes and measures for the protection of the marine environment
<p>4. Resource implications</p>	<p>Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a. demonstrate performance in suitably-simulated activities aimed at the protection of the marine environment covering an appropriate range of situations experienced on a vessel and/or b. contribute to measures to protect the marine environment on a vessel in an appropriate range of situations, weather and loading conditions
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. completing activities aimed at compliance with relevant regulatory requirements for protection of the marine environment a.2. identifying and evaluating problems related to compliance with relevant regulations for environmental protection and determining an appropriate courses of action a.3. following anti-pollution procedures a.4. assessing compliance of vessel with relevant regulatory requirements for protection of the marine environment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. Relevant regulatory requirements dealing with environmental protection b.2. OHS regulations and hazard prevention policies and procedures b.3. job procedures and work instructions related to environmental protection b.4. following on-board housekeeping processes b.5. waste, pollution and recycling management processes, where relevant c. Action is taken promptly to report and/or rectify breaches of environmental protection regulations d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

ENSURE COMPLIANCE WITH POLLUTION PREVENTION MEASURES

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	2	1	2	2

TRANSPORT AND DISTRIBUTION TRAINING PACKAGE

Maritime Industry Sector

Contextualisation Statement

The following *Contextualisation Statement* is provided as an aid to trainers, assessors and others who need to apply cross-industry standards and standards from other industries in *Maritime Industry Sector* contexts. It provides additional information in the form of a 'General Description', 'Range of Variables' and an 'Evidence Guide' to assist those interpreting the standards to understand critical aspects of the maritime context including the types of vessels, equipment, tools and procedures involved, and critical underpinning knowledge and skills particularly related to safety management issues and compliance with maritime regulatory requirements and codes

The statement should be read in conjunction with the existing Ranges of Variables and Evidence Guides of the competency units concerned. The additional information should be used to ensure that training programs and assessment processes based on the standards, and designed for use with Maritime Sector trainees and staff, relate meaningfully to the key aspects and requirements of the Maritime Sector context.

GENERAL DESCRIPTION OF THE MARITIME SECTOR CONTEXT

The maritime industry sector differs from many other industry sectors in a variety of ways:

- Vessels may operate in remote locations out of direct contact with land and support services, requiring higher levels of operational reliability, safety and efficiency and a capacity to carry out emergency repairs if required
- Safety of personnel and the vessel is of central importance and is the focus of extensive international, national and State/Territory maritime regulations, particularly the prevention and control of emergencies such as collision and fire and the need for effective emergency procedures and drills
- Officers and crew form a close community in a restricted space over long periods of time requiring extensive teamwork and attention to human relationships on board a vessel
- Prevention of injury and illness amongst passengers and crew is especially important because of the relative isolation and remoteness of a vessel at sea. This requires especial attention to matters of food and personal hygiene
- The language and terminology of the Maritime Sector is different to other industry sectors (e.g. 'deck' versus 'floor', 'port hole' versus 'window', 'galley' versus 'kitchen', 'cabin' versus 'room', etc.)
- The watertight integrity of a vessel is vital for the safety of personnel on board a vessel and is the subject of special attention during maritime operations and maintenance
- The legal aspects of maritime operations tend to be different to that in other industry sectors, with the Master and Officers of a vessel having higher levels of legal responsibilities and authority than in most other industries. This has implications for the chain of command, the way in which command decisions are made, and how orders are given and followed on board a vessel.
- Communications with land bases and other vessels is of crucial importance for vessels (requiring the use of VHF, HF and GMDSS radio and various visual signalling processes)
- Vessels may be called upon to play an active role in air / sea search and rescue operations

Range Of Variables

VARIABLE	SCOPE
<p>1. General context <i>as it applies to the competency unit concerned</i></p>	<p>a. Work must be carried out in compliance with the relevant maritime regulations.</p> <p>a.1. Where vessels operate within international waters and other unrestricted contexts, this will generally include AMSA Marine Orders and relevant IMO Codes and Conventions including STCW 95, ISM Code (concerning integrated safety management on board vessels), SOLAS Convention (concerning safety of life at sea), MARPOL Convention (concerning pollution of the marine environment) Convention and the IAMSAR Convention (concerning aeronautical and maritime search and rescue)</p> <p>a.2. Where vessels operate within near coastal and inshore waters and other restricted contexts, this will generally include State/Territory marine regulations administered by the relevant State/Territory marine authority. Consistency between the various State/Territory regulations is achieved through the Australian Uniform Shipping Laws (USL) Code administered by the National Maritime Safety Committee. As at August, 2000, the current USL Code is currently being reviewed in consultation with the maritime industry and the marine authorities in the States and Territories.</p> <p>b. Work is performed under appropriate level of supervision, generally within a team environment.</p> <p>c. Vessels may include Australian and international vessels ranging from small commercial vessels of less than 12 metres in length to large commercial vessels in excess of 500 gross tonnage and/or 3,000 kW propulsion power. This includes a range of specialist vessels including roll-on roll-off passenger and cargo vessels, oil, chemical and gas tankers, high speed vessels which require additional specialised skills for safe operation, navigation and maintenance.</p> <p>d. All personnel working on commercial maritime vessels regardless of their occupation or position on the vessel are required to have received training and be competent in skills and knowledge required to:</p> <ul style="list-style-type: none"> • contribute to effective human relationships on board a vessel • understand orders and be understood in relation to shipboard duties • observe safe working practices • comply with emergency procedures • provide first aid • survive at sea in the event of vessel abandonment • minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire • fight and extinguish fires
<p>2. Worksite environment may include <i>as it applies to the competency unit concerned</i></p>	<p>a. Operations will usually need to be conducted by day or night in all possible weather and sea conditions.</p> <p>b. Key equipment may include:</p> <ol style="list-style-type: none"> b.1. bridge systems, equipment, indicators and controls b.2. engine room systems, equipment, indicators and controls b.3. auxiliary systems, equipment, indicators and controls b.4. deck machinery and systems b.5. galley and catering/accommodation areas b.6. hull and propulsion system <p>c. Fault conditions and related fault finding and diagnostic techniques may include those relevant to the standard concerned and required for safe, efficient and effective vessel operations.</p> <p>d. Scope of units included in the Maritime Sector of the Training Package encompasses all maritime 'commercial' vessels and operations covered by Australian and international Maritime regulations, conventions and codes</p> <p>e. Customer service standards may include those relevant to the standard concerned and specified by vessel owners for the comfort, convenience and safety of their passengers and customers.</p> <p>f. Tools and instrumentation may include those relevant to the standard concerned and needed to safely, efficiently and effectively carry out the maintenance and operational activities necessary in a well-functioning vessel</p> <p>g. Safety hazards and hazard prevention measures will include all those specified in statutory and organisational requirements for occupational health and safety and the safe operation of a vessel including compliance with ISM Code safety management system</p>

<p>3. Sources of information / documents <i>as they apply to the competency unit concerned</i></p>	<p>a. Documentation / records may include:</p> <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO STCW Convention and Code a.5. AMSA Marine Orders a.6. IMO SOLAS Convention a.7. IMO MARPOL Convention a.8. IMO/ICAO IAMSAR Convention a.9. vessel's log a.10. maintenance records a.11. safety incident reports a.12. company procedures a.13. vessel / equipment manufacturer's instructions and recommended procedures a.14. annual and weekly notices to mariners a.15. instructions of relevant Maritime Authorities a.16. pilot instructions where relevant a.17. relevant Australian and international standards <p>b. Documentation / records may be in the form of:</p> <ul style="list-style-type: none"> b.1. hard copy procedures and instructions b.2. computer files / records b.3. forms and pro-forma reports b.4. operating and maintenance manuals
<p>4. Workplace context</p>	<p>a. The workplace context of a vessel is defined by:</p> <ul style="list-style-type: none"> a.1. Maritime Sector work organisation, procedures and practices a.2. Relevant maritime regulations a.3. Conditions of service, legislation and industrial agreements including: <ul style="list-style-type: none"> a.3.1. Maritime Industry workplace agreements and awards a.3.2. State, Federal or Territory legislation and related regulations as they apply to maritime operations
<p>5. Applicable State/ Territory/ Commonwealth regulations and legislation</p>	<p>a. Applicable procedures and codes may include</p> <ul style="list-style-type: none"> a.1. relevant sections of national and international regulations, IMO Conventions and Codes, including AMSA Marine Orders and class society rules a.2. International Regulations for Preventing Collisions at Sea a.3. IMO SOLAS Convention a.4. IMO MARPOL Convention a.5. IMO/ICAO IAMSAR Convention a.6. relevant regulations of State/Territory marine authorities a.7. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

<p>1. Critical aspects of evidence to be considered <i>(as they apply to the competency unit concerned)</i></p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. operate in compliance with all safety, OHS and other statutory and organisational requirements applying to a vessel. a.2. interpret and communicate operational information a.3. complete all required procedures for the start up, operation and shut down of relevant equipment and systems a.4. manoeuvre and position vessels where required a.5. respond appropriately to emergencies, safety alarms and indicators a.6. operate, maintain and service a vessel's machinery, equipment, tools and instruments and equipment, as required a.7. complete all documentation relevant to the functions of the person concerned
<p>2. Interdependent assessment of units</p>	<p>a. The unit of competency may be assessed in conjunction with other units that form part of a job role of the person concerned. This may include units from both Maritime Sector and other relevant Training Packages</p>
<p>3. Required knowledge and skills <i>(as they apply to the competency unit concerned)</i></p>	<p>a. Knowledge of maritime systems and equipment may include:</p> <ul style="list-style-type: none"> a.1. principles, purpose and location of equipment controls a.2. operating procedures and control functions a.3. correct use of performance monitoring devices a.4. correct use of safety equipment a.5. ancillary system procedures a.6. complying with operational limits a.7. adjustment for safe and effective operation a.8. managing hazardous operational and maintenance situations <p>b. Knowledge of vessel construction, layout and subdivision requirements may include an understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead:</p> <ul style="list-style-type: none"> c. Maritime Sector documentation requirements and procedures d. ISM Code management safety systems, procedures and requirements e. Company and vessel policies and procedures f. OH&S legislation, codes of practice, policies and procedures g. Maritime Sector communication techniques and requirements h. Working as part of a team on board a vessel
<p>4. Resource implications</p>	<p>a. Access is required to relevant maritime vessels, equipment, and operational situations in a real or appropriately simulated Maritime Sector environment.</p>
<p>5. Consistency in performance</p>	<p>a. Applies relevant underpinning Maritime Sector knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. completing tasks a.2. identifying improvements a.3. applying safety precautions relevant to the task a.4. assessing operational capability of equipment used and work processes selected <p>b. Shows evidence of application of relevant Maritime Sector workplace procedures including:</p> <ul style="list-style-type: none"> b.1. hazard policies and procedures, including ISM Code safety management systems and procedures b.2. issue resolution procedures b.3. job procedures and work instructions b.4. relevant guidelines relating to the use of machinery and equipment capability and limitations b.5. security procedures b.6. following enterprise housekeeping processes b.7. waste, pollution and recycling management processes <p>c. Action taken promptly, accidents and incidents reported in accordance with Statutory requirements and established Maritime Sector / vessel procedures</p> <p>d. Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among staff and others</p> <p>e. Work completed systematically with attention to detail without damage to goods, equipment or facilities.</p>

6. Context for assessment

- a. Assessment of a Maritime Sector or cross-industry competency unit must include approved arrangements for the assessment of knowledge and practical competence
- b. Assessment of knowledge may occur:
 - b.1. at a recognised maritime training institution and/or
 - b.2. concurrently with practical assessment
 - b.2.1. through appropriately simulated role plays, case studies and assessment exercises and/or
 - b.2.2. during seetime on a working or training vessel
- c. Practical assessment may occur:
 - c.1. through appropriately simulated role plays, case studies and assessment exercises and/or
 - c.2. during seetime on a working or training vessel
- d. Assessment of competence must comply with the requirements of relevant maritime regulations

CROSS INDUSTRY UNITS SUGGESTED AS RELEVANT FOR THE MARITIME INDUSTRY TRAINING PACKAGE WITH APPROPRIATE CONTEXTUALISATION

Note that this is not an exhaustive list and that cross industry units from other Industry Training Packages may be identified and used within Maritime Qualifications to meet the needs of persons working in specific enterprises or maritime contexts

Yachting (Small Boat) *(from National Outdoor Recreation Industry Training Package)*

SRO YSB 001A	Use basic skills to sail a small boat in controlled conditions
SRO YSB 002A	Sail a small boat in light to moderate conditions using enhanced skills
SRO YSB 003A	Sail a small boat in moderate conditions using enhanced skills

Seafood Vessel Operations *(from Seafood Industry Training Package)*

SFICORE 104A	Meet workplace health and safety requirements
SFISHIP 211A	Take emergency action on board a vessel
SFISHIP 202A	Contribute to safe navigation

Commercial cookery and catering *(from Hospitality Training Package)*

THHCOR01A	Work with colleagues and customers	THBBCC05A	Prepare and cook poultry and game
THHCOR02A	Work in a socially diverse environment	THBBCC06A	Prepare and cook seafood
THHCOR03A	Follow health, safety and security procedures	THBBCC07A	Identify and prepare meat
THHBKA01A	Organise and prepare food	THBBCC08A	Prepare hot and cold desserts
THHBKA02A	Present food	THBBCC09A	Prepare pastry, cakes and yeast goods
THHBKA03A	Receive and store stock	THHBCC10A	Plan and prepare food for buffets
THHBKA04A	Clean and maintain premises	THHBCC11A	Implement food safety procedures
THHBCC01A	Use basic methods of cookery	THIEBCC12A	Prepare diet based and preserved foods
THHBCC02A	Prepare appetisers and salads	THHBCC13A	Plan and control menu-based catering
THHWC02aA	Prepare sandwiches	THHBCC14A	Organise bulk cooking operations
THHADCC02A	Plan, prepare and display a buffet	THHBCC15A	Organise food service operations
THHADCC04A	Prepare portion controlled meat cuts	THHS2CC1A	Monitor catering revenue and costs
THHADCC05A	Handle and serve cheese	THHS2CC2A	Establish and maintain quality control
THHBCC03A	Prepare stocks and sauces	THHS2CC3A	Develop a food safety plan
THBBCC03aA	Prepare soups	THHBCATO1A	Prepare foods according to specific dietary and cultural needs
THHBCC04A	Prepare vegetables, eggs and farinaceous dishes		

Security *(from Hospitality Training Package)*

THHBTHS01A	Maintain the security of premises and property	THHBTHS08A	Escort and carry valuables
THHBTHS02A	Determine and use reasonable security force to control access to and exit from premises	THHBTHS09A	Control crowds
THHBTHS03A	Maintain safety of premises and personnel	THHBTHS11A	Interpret information from advanced security equipment
THHBTHS04A	Manage intoxicated persons	THHBTHS12A	Operate central monitoring/communication station
THHBTHS05A	Operate basic security equipment	THHBTHS16A	Provide lost and found facility
THHBTHS06A	Apprehend offenders	THHBTHS17A	Observe and monitor people
THHBTHS07A	Screen baggage and people to minimise security risk	THHADTHS01A	Plan and conduct evacuation of premises
		THHADTHS02A	Provide for safety of VIPS

Housekeeping *(from Hospitality Training Package)*

THHBH01A	Provide housekeeping services to guests	THHBH0314A	Prepare rooms for guests
THHBH02A	Clean premises and equipment	THHBH05A	Launder linen and guest clothes
		THHBH06A	Provide valet service

Engineering *(from Metal and Engineering Training Package)*

MEM 18.1 A	Use hand tools	MEM 5.6 A	Perform brazing and/or silver soldering
MEM 18.2 A	Use power tools/hand held operations	MEM 5.7 A	Manual heating thermal cutting and gouging
MEM 5.1 A	Manual soldering / desoldering electrical. electronic components	MEM 5.15 A	Weld using manual metal arc welding process
MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)	MEM 7.5 A	Perform general machining

Training and Assessment *(from Assessors and Workplace Trainers Training Package)*

BSZ401A*	Plan assessment	BSZ502A	Design and establish the training system
BSZ402A *	Conduct assessment	BSZ503A	Design and establish the assessment system
BSZ403A*	Review assessment	BSZ504A	Manage the training and assessment system
BSZ404A	Train small groups	BSZ505A	Evaluate the training and assessment system
BSZ405A	Plan and promote a training program	BSZ506A	Develop assessment procedures
BSZ406A	Plan a series of training sessions	BSZ507A	Develop assessment tools
BSZ407A	Deliver training sessions	BSZ508A	Design training courses
BSZ408A	Review training		
BSZ501A	Analyse competency requirements		

* These units will be considered as one unit towards a qualification within this training package.

Transport *(from Transport and Distribution Training Package)*

TDT RB11 98A	Maintain and use basic hand tools	TDT J2 97A	Apply quality systems
TDT D1 97A	Shift materials safely	TDT K1 97A	Use computer applications
TDT D2 97A	Use manual handling equipment	TDT K3 97A	Apply keyboard skills
TDT D3 98A	Handle hazardous substances/dangerous goods	TDT RL1 98A	Monitor and process attendance records
TDT RE2 98A	Work with travel agencies and sales outlets	TDT RL2 98A	Implement equal employment equity strategies
TDT E1 97A	Present workplace information	TDT RL3 98A	Promote effective workplace practice
TDT E3 97A	Participate in workplace communication	TDT L1 97A	Complete induction procedures
TDT E4 97A	Prepare workplace documents	TDT L3 97A	Conduct induction process
TDT E5 97A	Carry out workplace calculations	TDT O11 98A	Provide revenue protection measures
TDT E8 97A	Process workplace documentation	TDT O12 98A	Manage disruptive and/or unlawful behaviour
TDT RF1 98A	Investigate safety incidents	TDT O13 98A	Administer the security of assets and facilities
TDT F8 97B	Provide first aid in the workplace	TDT RQ1 98A	Maintain customer credit accounts and services
TDT G1 97A	Work effectively with others	TDT RQ2 98A	Maintain petty cash account
TDT G2 97A	Lead work team or group	TDT RQ3 98A	Sell products and services
TDT I2 97B	Apply customer service skills		
TDT J1 97A	Apply quality procedures		

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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>).

Maritime Training Package –TDM01

Sheet: 1 of 2

Version	Date of Release	Authorisation:	Comments
2	24/11/2003	NTQC	<p>Change to 'Maritime Sector Qualification' to include 'It should also be noted that TDMMF4502A and TDMMF5302A together are an alternative to TDMMF901A'</p> <p>Inclusion of a mapping exercise outlining new units and how they relate to existing units.</p> <p>Additional units to qualifications in: Certificate I in Maritime Operations Certificate II in Maritime Operations Certificate III in Maritime Operations Certificate IV in Maritime Operations Certificate II in Marine Engine Driving Certificate III in Marine Engine Driving Certificate IV in Marine Engineering</p> <p>Amendments to Units: TDMMB101B Perform routine remedial, preventative and survey deck maintenance on a vessel TDMMC701B Apply seamanship skills and techniques when operating a small domestic vessel TDMMC901B Manoeuvre a domestic vessel of less than 12 metres in length operating within shore limits TDMMC1001B Steer a domestic vessel under the direction of the master or officer in charge of the watch TDMME801B Transmit and receive information by GMDSS subsystems and equipment on a vessel TDMMF501B Develop emergency and damage control plans and handle emergency situations on board a vessel TDMMF701B Observe safe working practices and procedures on board a vessel TDMMF801B Comply with emergency procedures on board a vessel TDMMF3201B Apply domestic regulations when operating a small vessel</p> <p>New Units: TDMMF4502A Operate breathing apparatus on board a vessel TDMMF4702A Contribute to maintaining a safe watch on a domestic vessel TDMMF4802A Execute watchkeeping arrangements and procedures on a domestic vessel TDMMF5302A Fight and extinguish fires on board a small vessel TDMMH1102A Use radar to maintain safe navigation TDMMH1202A Plan and navigate a short voyage within inshore limits TDMMH1302A Apply weather information when navigating a small domestic vessel TDMMR5402A Carry out refueling and fuel transfer operations</p>

			TDMMR5502A Perform rigging and lifting operations on board a small domestic vessel TDMMU502A Ensure compliance with environmental considerations in a small domestic vessel
1.00	30/08/2001	NTOC	Primary release

Forms control: All endorsed training packages will have a version number displayed on the imprint page of every volume constituting that training package. Every training package will display an up-to-date copy of this modification history form, to be placed immediately after the contents page of the first volume of the training package. Comments on changes will only show sufficient detail to enable a user to identify the nature and location of the change. Changes to training packages will generally be batched at quarterly intervals. This modification history form will be included within any displayed sample of that training package and will constitute all detail available to identify changes.

INTRODUCTION

The 2001 version of the Maritime Training Package is in addition to the previous Transport and Distribution Training Package developed by TDT, which includes the following:

- Road Transport Competency Standards and Qualifications
- Warehousing Competency Standards and Qualifications
- Stevedoring Competency Standards and Qualifications
- Rail Operations Competency Standards and Qualifications
- Rail Infrastructure Competency Standards and Qualifications

Each Competency Standards manual includes the framework that details the requirements for completion of a qualification, under the Australian Qualification Framework.

It is important that this manual be used in conjunction with the Assessment Guidelines. Users should also reference the Australian Recognition Framework.

The Maritime Sector acknowledges the need to apply selected cross industry standards and standards from other industries. These have not been fully reproduced in this Training Package. These standards are listed at the end of this document. To ensure currency and correct usage, Registered Training Organisations and Enterprises wishing to include these standards in the development of a qualification are required to source the latest version of the standards from the original developer. Further the standards are only to be used in building Maritime qualifications at the comparable AQF level of the original standards and qualification. A maritime contextualisation statement is also contained at the end of this manual. The statement should be read in conjunction with the existing Range of Variables and Evidence Guides of competency units concerned. The additional information in the contextualisation statement should be used to ensure that training programs and assessment processes based on the standards, and designed for use with Maritime sector trainees and staff relate in a meaningful way to key aspects and requirements of the Maritime sector context, particularly safety management and the protection of the marine environment.

The Maritime Training Package is subject to continuous revision. It is suggested that users confirm the status of this manual prior to use. Confirmation can be given from:

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West Melbourne VIC 3003

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AUSTRALIAN QUALIFICATIONS FRAMEWORK

The Maritime Training Package provides significant flexibility to Registered Training Organisations, enterprises and individuals in packaging units together which lead to a qualification.

This level of flexibility reflects the multiple job roles, enterprise requirements and changing technological nature of the industry. It is expected however that users of this Training Package select units, which packaged together, provide a coherent qualification, inclusive of all the competencies necessary to fulfil occupation requirements.

Importantly, the flexibility of packaging available within the qualifications framework must be considered within the responsibility of individuals, enterprises and/or Registered Training Organisations to package units together to meet legislative requirements and industry codes of practice necessary at an occupational level.

In packaging units together to form a training program, users should be aware of requirements set out in the Maritime Assessment Guidelines, and the Australian Recognition Framework. The qualification framework within this manual provides the units available within each qualification level and requirements for completion of a qualification. **It should be noted that the appropriate regulatory bodies should be consulted in order to determine the correct combination of units which would constitute a particular license.**

Additional notes from the NSCV Part B

Commercial purpose -

For the purposes of this National Standard, use in connection with a commercial transaction of any kind including operations -

- a) as a business
- b) as a service (including a service provided by the Crown);
- c) for profit; or
- d) for research

Commercial vessel -

For the purposes of this National Standard means -

- a) any ship, boat or any other type of craft capable of navigation that is used for a commercial purpose including a dinghy; lighter; barge; punt; raft; houseboat; air cushion vehicle or other ground effect craft; but does not include seaplanes or other aircraft; or
- b) a structure designed to float in water that is used for a commercial
- c) purpose, other than -
 - i) pontoons or floating jetties that are used only for the purposes of walkways or storage; or
 - ii) similar platforms situated adjacent to river banks or any other shore in circumstances in which they are not being towed or moored away from the shore.

A domestic vessel is a vessel which primarily engages in domestic operations. Part B of the National Standard for Commercial Vessels defines domestic operations as:

Domestic operations -

Operations which do not include international voyages. A vessel is engaged in domestic operations if the place of departure and the first place of arrival are within Australia, notwithstanding that the vessel may travel through waters which are outside Australian territorial limits.

MARITIME SECTOR QUALIFICATIONS

The Maritime qualifications are summarised in the tables on the following pages. The qualifications reflect the competency requirements for the occupational pathways of integrated ratings, deckhands, marine engine drivers, marine engineers and deck officers working on board vessels operating in international and Australian coastal and inshore waters.

The qualifications and the component competency units have been carefully designed in conjunction with Maritime Sector advisors to align closely with the regulatory requirements and framework of the various National, State and Territory marine authorities. As appropriate, cross-industry units from other industry training packages may be incorporated into the qualifications to meet specific enterprise needs. Details of a number of cross-industry units are provided in this booklet together with a maritime sector contextualisation statement. This list of cross-industry units is not exhaustive however. Registered Training Providers and enterprises may identify a need to use other cross-industry units not on the list. In such cases, TDT Australia should be contacted to confirm the appropriateness of the proposed inclusion.

Care needs to be taken by Registered Training Organisations when structuring qualifications that trainees are not only prepared and assessed for qualifications within the Australian Qualifications Framework but also the relevant marine certification or licensing requirements of the Australian Maritime Safety Authority and/or the relevant State/Territory marine authorities. Registered Training Organisations are advised to refer to the relevant marine authorities to confirm certification requirements, as well as requirements of marine authorities for training providers involved in training and competency assessment for the marine sector.

Persons involved in Marine occupations need to fulfil the mandatory pre-sea competency requirements as covered by the following maritime competency units and related certification requirements of relevant marine authorities.

A successful outcome of pre-sea entry-level units is as follows:

- TDMME101A Understand orders and be understood in relation to shipboard duties
- TDMMF701A Observe safe working practices and procedures on board a vessel
- TDMMF801A Comply with emergency procedures on board a vessel
- TDMMF1001A Provide first aid
- TDMMF1101A Survive at sea in the event of vessel abandonment
- TDMMF1201A Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMML201A Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

TDMMF901A – refers to STCW endorsement whereas TDMMF5302A is the minimum required by State Marine Authorities. Persons attaining TDMMF5302A together with TDMMF4502A when achieving NSCV endorsement can equate these units with TDMMF901A.

It should be noted that TDMMF4502A and TDMMF5302A together are an alternative to TDMMF901A.

MAPPING OF NEW UNITS TO EXISTING MARITIME UNITS

NEW UNIT CODE	NEW UNIT TITLE	RELATED UNIT	RELATED UNIT TITLE	REASON FOR CHANGE	AQF LEVEL	INTENDED PROFILE
TDMMB101B	Perform routine remedial, preventative and survey deck maintenance on a vessel	TDMMB101A	Perform routine remedial, preventative and survey deck maintenance on a vessel	Changes have been made to make the unit more generic and relevant to domestic vessels	L3 - Operations	M5, IR
TDMMC701B	Apply seamanship skills and techniques when operating a small domestic vessel	TDMMC701A	Apply seamanship skills and techniques when operating a small vessel	Inclusive of towing & sea anchors to align with NSCV Part D and picks up element from MB6, MC7 to replace MB6 for Coxswain	L2 – Operations	Coxswain, M5
TDMMC901B	Manoeuvre a domestic vessel of less than 12 metres in length operating within in shore limits	TDMMC901A	Manoeuvre a commercial vessel of less than 12 metres in length within inshore limits	Crossing bars and cyclones added	L2- Operations	Coxswain
TDMMC1001B	Steer a domestic vessel under the direction of the Master of Officer in Charge of the Watch	TDMMC1001A	Steer a commercial vessel under the direction of the Officer in Charge of the Watch	Changes have been made to make the unit more generic and relevant to domestic vessels	L3 – Operations	M5, IR
TDMME801B	Transmit and receive information by GMDSS subsystems and equipment on a vessel	TDMME801A	Transmit and receive information using GMDSS subsystems and equipment	International Code of Signals moved to MF48. This unit to be optional for M4	L4 – Operations	M4 doing STCW
TDMMF501B	Develop emergency and damage control plans and handle emergency situations on board a vessel	TDMMF501A	Develop emergency and damage control plans and handle emergency situations	Greater emphasis on entry into enclosed spaces to reflect NSCV Part D Annex B Outcome B12.2	L6 – Operations/Engineering	Eng 3

MAPPING OF NEW UNITS TO EXISTING MARITIME UNITS (continued)

NEW UNIT CODE	NEW UNIT TITLE	RELATED UNIT	RELATED UNIT TITLE	REASON FOR CHANGE	AQF LEVEL	INTENDED PROFILE
TDMMF701B	Observe safe working practices and procedures on board a vessel	TDMMF701A	Observe safe working practices	Changes have been made to make the unit more generic and relevant to domestic vessels. It does not detract from applicability to STCW and larger vessels	L1 Operations/Engineering	All
TDMMF801B	Comply with emergency procedures on board a vessel	TDMMF801A	Comply with emergency procedures	Changes have been made to make the unit more generic and relevant to domestic vessels. It does not detract from applicability to STCW and larger vessels	L1 Operations/Engineering	All
TDMMF3201B	Apply domestic regulations when operating a small vessel	TDMMF3201A	Apply regulations when operating a small vessel	New unit developed for domestic vessels.	L2 – Operations	Coxswain, M5
TDMMF4502A	Operate breathing apparatus on board a vessel	TDMMF901A	Fight and extinguish fires	Separate unit dealing with breath apparatus. This unit will not be required for MED or Coxswain & M5 unless the vessel carries BA. BA is not carried on small domestic vessels	L1 Operations/Engineering	Eng 3, M4 and higher
TDMMF4702A	Contribute to maintaining a safe watch on a domestic vessel	TDMMF3501A	Contribute to maintaining a safe watch	New unit developed for domestic vessels	L3 – Operations	M5
TDMMF4802A	Execute watchkeeping arrangements and procedures on a domestic vessel	TDMMF3301A	Execute watchkeeping arrangements and procedures on a small vessel	Boosted to cover SAR in Australia, understanding of visual signalling methods and international code of signals	L4 – Operations	M4

MAPPING OF NEW UNITS TO EXISTING MARITIME UNITS (continued)

NEW UNIT CODE	NEW UNIT TITLE	RELATED UNIT	RELATED UNIT TITLE	REASON FOR CHANGE	AQF LEVEL	INTENDED PROFILE
TDMMF5302A	Fight and extinguish fires on board a small vessel	TDMMF901A	Fight and extinguish fires	Breathing apparatus moved to a new separate unit MF45.	L1 Operations/Engineering	All
TDMMH1102A	Use radar to maintain safe navigation	TDMMH501A	Use radar and other electronic aids to maintain safe navigation	ARPA removed from MH5 to made unit more appropriate to M5	L3 – Operations	M5
TDMMH1202A	Plan and navigate a short voyage within inshore limits	TDMMH801A	Plan and navigate an inshore passage	New unit for Coxswain	L2 – Operations	Coxswain
TDMMH1302A	Apply weather information when navigating a small domestic vessel	TDMMH701A	Apply weather information when navigating a small vessel	Amended to reflect tide requirements for M5	L2 Operations/Engineering	M5
TDMMR5402A	Carry out refuelling and fuel transfer operations			New units for Coxswain M5, MED 2 & 3	L2 Operations/Engineering	Coxswain, M5, MED 2 & 3
TDMMR5502A	Perform rigging and lifting operations on board a small domestic vessel	TDMMR3301A	Perform rigging and lifting operations on board a vessel	Changes have been made to made the unit more generic and relevant to domestic vessels	L3 Operations	M5
TDMMU502A	Ensure compliance with environmental considerations in a small domestic vessel	TDMMU401A	Ensure compliance with pollution prevention measures	New unit for Coxswain, M5, MED 2 & 3	L2 Operations/Engineering	Coxswain, M5, MED 2 & 3

CHANGES MADE TO MARITIME UNITS

	ORIGINAL UNITS	CHANGES
Unit	TDMMB101A	TDMMB101B
Title	Perform Routine Remedial, Preventative and Survey Deck Maintenance on a Vessel	Perform Routine Remedial, Preventative and Survey Deck Maintenance on a Vessel
Descriptor		No change
Performance Criteria		5d) Deleted: "into confined spaces".
Range of Variables		1a) Added: "master". 2a) Added: "domestic". 3a) Added: "Sources of information" 3a2) Added: safety management system under NSCV for domestic vessels 3a5) Added: "or other preventative maintenance scheme" 4a) Added: "regulations and legislation". 4a3) Added: "relevant sections of NSCV/USL Code and guidelines" 4a4) Added: "marine, environmental".
Evidence Guide		3b) Added: "(where required)" 3k) Added: "the Safety Management System (where required) or in industry standards and guidelines." 5b3) Added: "Safety Management System where required".

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMC701A	TDMMC701B
Title	Apply seamanship skills and techniques when operating a small vessel	Apply seamanship skills and techniques when operating a small domestic vessel
Descriptor		Add: standards in the NSCV/Australia Code (NSCV)
Performance Criteria		2a) Added: (as appropriate) 2b) Added: (as appropriate) 4c) Added: with regulatory requirements 4f) Added: vessel is prepared and anchored in varying weather conditions 4g) Anchor is weighed and vessel proceed in those same conditions 5a) New 5b) New 5c) New 6a) New 6b) New 6c) New 6d) New 6e) New
Range of variables		2c10) New 2c11) New 2c12) New 3a) Added: sources of information.. 4a) Replaced: procedures and codes with: regulations and legislation 4a1) Added: NSCV
Evidence Guide		3c) Added: 'the materials' 3r) Added: 'Procedures for the checking and inspecting a vessel's seaworthiness' 3s) Added: 'Corrosion control measures including surface preparation and painting and antifouling'

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMC901A	TDMMC901B
Title	Manoeuvre a commercial vessel of less than 12 metres in length within inshore limits	Manoeuvre a domestic vessel of less than 12 metres in length operating within inshore limits
Descriptor		Add: relevant sections of the NSCV/Australian USL
Performance Criteria		No change
Range of Variables		1a) Added: NSCV'. 2ff5) Added: "cyclones or severe weather or" 3a) Replaced: "documents and records with sources of information and documentation" 4a) Replaced: "procedures and codes with regulation and legislation" 4ai) Added: 'NSCV Offshore'
Evidence Guide		3h) New 3i) New

CHANGES MADE TO MARITIME UNITS (continued)

		CHANGES
Unit	TDMMC10A	TDMMC1001B
Title	Steer a Commercial Vessel under the direction of the Office in Charge of the Watch	Steer a domestic vessel under the direction of the Master or Officer in Charge of the Watch
Descriptor	Officer in Charge of the Watch	Master or Officer in Charge of the Watch Add: and the NSCV/Australian USL Code
Performance Criteria		1b) Added: "in Charge". 1f) Added: "in Charge". 2a) Added: "in Charge".
Range of Variables	4a) deleted 'procedures and codes'.	1a) Added: "and domestic regulations, codes and standards". 1c) Added: "in small domestic vessels, the Master may provide the supervision in lieu of the Officer in Charge of the Watch and a deckhand may carry out the role of an Integrated Rating or Rating" 1d) Added: "in Charge". 2d) Added: "Master or Officer in Charge of the Watch" 4a) Replaced: with 'regulations and legislations'. 4a3) Added: relevant sections of NSCV/USL Code and guidelines.
Evidence Guide		3a) Added: "and the NSCV/USL Code" 3b) Added: "State & Territory marine" 3j) Added: "Officer in Charge of the Watch" 5b1) Added: "and the NSCV/USL Code" 5b2) Added: "Ship's Safety Management System and procedures" 5b3) Added: "marine and"

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
	TDMME801A	TDMME801B
Title	Transmit and receive information using GMDSS subsystems and equipment	Transmit and receive information by GMDSS subsystems and equipment on a vessel
Descriptor		Add: NSCV/ Australian USL Code
Elements		No change
Performance Criteria		No change
Range of Variables		a) Replaced: 'documentation/records' with 'information and documentation'.

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMF501A	TDMMF501B
Title	Develop emergency and damage control plans and handle emergency situations	Develop emergency and damage control plans and handle emergency situations on board a vessel
Descriptor		Replaced: "Section" with "Table" Added: "NSCV/Australian USL Code"
Element		6) New
Performance Criteria		a) New b) New
Range of Variables		2bb10) New 2dd10) Added: "including from confined spaces" 2ff3) Replaced: "fuel or heat source", with "fire extinction methodologies". 2g) Added: ", and lifesaving" 2gg1) New 2gg6) New 3a) Replaced: "documentation/records" with information and documentation" 3aa1) Removed "ISM Code" 4a) Replaced: "procedures and codes" with "regulations and legislation" 4aa2) New

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Units	TDMMF701A	TDMMF701B
Title	Observe safe working practices	Observe safe working practices and procedures on board a vessel
Descriptor		Replaced: "Section" with "Table"
Elements		Unchanged
Performance Criteria		Unchanged
Range of Variables		2cc8) Added: "fishing or passenger" 2dd7) Added: "or fresh water stowage" 2dd10) New 2ee2) Added: "cargo" 2hh3) deleted "other committees for examples consultative, planning and purchasing" 2ii1) Replaced: "senior" with "ship's" 2ii4) Replaced: "senior" with "ship's" 3a) Replaced: "documentation/records" with "information and documentation" 3aa1) Added: "machinery/equipment manuals" 4a) Replaced: "procedures and codes" with "regulation and legislation." 4aa1) Replaced: "National" with "Federal and State/Territory"
Evidence Guide		1aa3) Added: "and other documentation" 3d) Added: "operation"

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMF801A	TDMMF801B
	Comply with emergency procedures	Comply with emergency procedures on board a vessel
Descriptor		Added: "NSCV/Australian USL Code"
Elements		Unchanged
Performance Criteria		2cc12) Added: "cyclones or severe weather" 3a) Replaced: "Documentation/records with "Sources of information and documentation" 4aa2) Added: "NSCV"
Evidence Guide		Unchanged

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
	TDMMF3201A	TDMMF3201B
Title	Apply regulations when operating a small vessel	Apply domestic regulations when operating a small vessel
Descriptor		Replaces: 'Australian and International legislative requirements' with 'National Standards for Commercial Vessels (NSCV) and other legislative requirements...'. Addition: 'NSCV'....
Elements		Replaces: "Australian and International legislative codes and conventions with "legislative codes including the NSCV"
Performance Criteria		3h) New 3i) New 3j) New
Range of Variables	4. reads.. "Applicable International, Australian and State/Territory regulations/legislations"	4. Now reads: "Applicable Australian and State/Territory regulations and legislation and NSCV 2b) Replaced: "Australian and International maritime legislation codes and conventions" with "Australian maritime legislation, codes and NSCV must be maintained." 3a) Replaced: "Documentation/records may include..." "Sources of information and documentation.." 4a2) Replaced: 'International' with "NSCV" 4a3) Replaced: 'MARPOL Convention' with "relevant Australian pollution control requirements."
Evidence Guide	3i) "... systems and methods for recording, retrieving and storing information on board a small vessel and their strengths and limitations. 3j) "...Procedures for maintaining the security and confidentiality of the information..."	3i) Replaced with: "Knowledge of International Collision Regulations relevant to a domestic vessel under 24 m operating offshore waters." 3j)" "...Knowledge of IALA Buoyage and interaction relevant to shipping a vessel under 12 m operating in inshore waters." 4a2) New

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
	TDM MF3501A	TDMMF4702A
Title	Contribute to Maintaining a Safe Watch	Contribute to Maintaining a Safe Watch on a Domestic Vessel
Descriptor	<p>"This unit involves the skills and knowledge required by an integrated rating to contribute to a safe navigational watch on a commercial vessel under the direction of the Officer of the Watch and in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of the vessels and the persons on board."</p> <p>The unit is consistent with the related functional standard in Section A II/4 of the STCW95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4.</p>	<p>Replaced: with:</p> <p>"This unit involves the skills and knowledge required by either the Master or Watchkeeper to contribute to a safe navigational watch on a small domestic commercial vessel and in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of the vessel and the persons on board."</p> <p>This unit is consistent with the relevant functional standard in the NSCV/Australia USL Code."</p>
Elements		No change
Performance Criteria	1a) "effective communication with the officer of the watch is correctly maintained at all times on matters relevant to the role of an integrated rating during watchkeeping duties."	<p>1a) Replaced: "effective communication with the Master is correctly maintained at all times on matters relevant to the safety of the vessel during watchkeeping duties."</p> <p>1b) Replaced: "Bridge" with "Wheelhouse". Replaced: "Officer of the Watch" with "Master".</p>

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
	TDM MF3501A - continued	TDMMF4702A - continued
		<p>2a) Replaced:.. "Officer on the Watch" with "Master". Omitted "...bridge procedures".</p> <p>2b) Omitted "bridge procedures".</p>
Range of Variables	<p>2a) "Vessel may include any Australian or International Commercial Vessel." 2c) deleted..."for a rating as laid out in the AMSA Marine Orders</p> <p>3aa1) deleted "ISM Code".</p> <p>4aa1) 'relevant sections of IMO STCW 95 Code and Convention'. 4aa2) "relevant sections of AMSA Marine Orders". 4aa3) deleted "ISM Code".</p>	<p>1a) Added: USL Code, NSCV and guidance published by Marine Authorities and (where relevant).."</p> <p>1b) Replaced: ... "Officer of the Watch as a member of a bridge team," with "Master as a Watchkeeper on a small domestic vessel."</p> <p>1b) Replaced: ... "Officer of the Watch" with "Master".</p> <p>2a) Vessel is restricted to an Australian domestic vessel only</p> <p>2c2) Replaced: "duties of lookout and helmsman must be kept separate" with "management of the steering and Title of the vessel".</p> <p>2ee8) Added: "or propulsion controls". Deleted.. "Ice formation on hull and superstructure and floating ice."</p> <p>3aa3) Replaced: "Officer in Charge of the Watch", with "Master".</p> <p>4aa1) USL Code 4aa2) NSCV</p>

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
	TDM MF3501A - continued	TDMMF4702A - continued
Evidence Guide	<p>3p) Maritime communication techniques onboard a used within a bridge team onboard a vessel</p>	<p>1aa2) Replaced: “..integrated rating”, with “Watchkeeper”.</p> <p>2a) Replaced: “...integrated rating on a commercial vessel”, with “watchkeeper on a small domestic vessel”.</p> <p>3a) Added: “..Marine”</p> <p>3b) Replaced: “Bridge” with “Wheelhouse”.</p> <p>3c) Replaced: “Bridge” with “Wheelhouse”.</p> <p>3j) Replaced: “Integrated Rating” with “Watchkeeper”</p> <p>3k) Replaced: “unmanned machinery” with “machinery”.</p> <p>3l) Added: “..automated steering systems</p> <hr/> <p>3p) Maritime communication techniques onboard a onboard a vessel</p> <hr/> <p>4aa1) Replaced: “Integrated Rating” with “Watchkeeper”.</p> <p>4aa2) Replaced: “Integrated Rating” with “Watchkeeper”.</p> <p>5aa1) Replaced: “lookout” with “Watchkeeper”.</p> <p>5aa2) Replaced: “Officer In Charge of the Watch” with “Master”.</p> <p>5aa3) Replaced: “Integrated Rating during watch keeping operations” with “Watchkeeper”.</p> <p>5aa4) Replaced: “Officer In Charge of the Watch” with “Master”.</p> <p>5aa5) Replaced: “Officer In Charge of the Watch” with “Master”.</p> <p>5bb1) Deleted ‘ISM Code’.</p> <p>5bb4) Replaced: “Integrated Rating” with “Watchkeeper”.</p>

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMF3301A	TDMMF4802A
Title	Execute watchkeeping arrangement and procedures on a small vessel	Execute watchkeeping arrangements and procedures on a domestic vessel
Descriptor		Unchanged
Element		Unchanged
Performance Criteria		Unchanged
Range of Variable		3a) Replaced: "documentation/records" with "information and documentation". 3aa3) Added: "NSCV" 4aa1) Added: "NSCV"
Evidence Guide		3p) New 3q) New 3r) New 3s) New

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMF901A	TDMMF5302A
Title	Fight and extinguish fires	Fight and extinguish fires on board a small vessel
Descriptor		Added: "including operating portable fire-fighting equipment, recharging portable fire extinguishers and carrying out fire-fighting operations." Replaced: "section" with "table". Added: "NSCV".
Elements		Unchanged
Performance Criteria	3g) Removed 3j) Removed	1a) Added: "D, E and F" 3g) New
Range of Variables		2bb8) New 2c) Added: "D, E". 3a) Replaced: "Documentation/records" with "Sources of information and documentation". 4aa3) Added: "NSCV".
Evidence Guide	3f) Removed 3h) Removed	

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMH501A	TDMMH1102A
Title	Use radar and other electronic aids to maintain safe navigation	Use radar to maintain safe navigation
Descriptor	<p>"This unit involves the skills and knowledge required to maintain safe navigation of a commercial vessel through the use of radar and other navigational aids, including automatic radar plotting aids (ARPA). This includes initialisation and operation of radar and other modern navigational systems, interpreting all available navigational data and using it for avoiding collisions and ensuring the safe navigation of the vessel.</p> <p>The unit is consistent with the related functional standard in Section A II/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2, and relevant sections of the Australian USL Code.</p>	<p>"This unit involves the skills and knowledge required to maintain safe navigation of a commercial vessel through the use of radar and other modern navigational systems, interpreting all available navigational data and using it for avoiding collisions and ensuring the safe navigation of a vessel."</p> <p>The unit is consistent with the related functional standard in the National Standard for Commercial Vessels.</p> <p>This unit when combined with TDM MH3 (ARPA) is equivalent to TDM MH5.</p>
Element	<p>1 Set up radar and other electronic navigational aids</p> <p>2. Use radar and other electronic navigational aids</p>	<p>1. Set up radar</p> <p>2. Use radar and GPS/DGPS</p>

	ORIGINAL UNITS	CHANGES
Unit	TDMMH501A (continued)	TDMMH1102A (continued)
Range Of Variables	Deleted: C2 C3 C4 C6	1c) Replaced: "Relevant electronic navigational aids" with "GPS/DGPS" 2b) Replaced: "electronic navigational aids" with "Radar and GPS/DGPS" 2c) Replaced: "electronic navigational aids" with Equipment 2d) Replaced: "electronic navigational aids" with GPS/DGPS 3a) Replaced: "Documentation/records" with "Sources of information and documentation." 3aa6) Removed "ISM Code". 4a) Replaced: 'procedures and codes' with 'domestic regulations and legislation'. 4aa3) Includes 'NSCV'.
Evidence Guide		1aa1) Replaced: "electronic navigational aids" with radar and GPS/DGPS 1aa2) Replaced: "electronic navigational aids" with radar and GPS/DGPS 1aa3) Replaced: "electronic navigational aids" with radar and GPS/DGPS 1aa4) Replaced: "electronic navigational aids" with radar and GPS/DGPS 1aa5) Replaced: "electronic navigational aids" with radar and GPS/DGPS 3b) Replaced: "electronic navigational aids" with radar and GPS/DGPS 3d) Removed "ARPA". 3g) Removed "ARPA". 3h) Removed "ARPA". 3i) Replaced: "electronic navigational aids" with radar and GPS/DGPS 3j) Replaced: "electronic navigational aids" with radar and GPS/DGPS 4aa2) Replaced: "electronic navigational aids" with radar and GPS/DGPS 5aa1) Replaced: "electronic navigational aids" with radar and GPS/DGPS 5aa2) Replaced: "electronic navigational aids" with radar and GPS/DGPS 5aa3) Replaced: "electronic navigational aids" with radar and GPS/DGPS 5aa4) Replaced: "electronic navigational aids" with radar and GPS/DGPS 5bb2) Removed "ISM Code" 5bb6) Replaced: "electronic navigational aids" with radar and GPS/DGPS 5c) Replaced: "electronic navigational aids" with radar and GPS/DGPS

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDMMH701A	TDMMH1302A
Title	Apply weather information when navigating a small vessel	Apply weather information when navigating a small domestic vessel
Descriptor		Added: "Domestic" Added: "NSCV".
Elements		Unchanged
Performance Criteria	Removed: 1d Removed: 3b	
Range of Variables		3a) Replaced: 'information/documentation' with 'information and documentation'. 3a8) Added: "NSCV". 4aa1) Added: 'NSCV'.
Evidence Guide	Removed: 1a2 Removed: 1a3 Removed: 1a6 Removed: 3g	

CHANGES MADE TO MARITIME UNITS (continued)

	ORIGINAL UNITS	CHANGES
Unit	TDTMR3301A	TDTMR5502A
Title	Perform rigging and lifting operations on board a vessel	Perform rigging and lifting operations on board a small domestic vessel
Descriptor		Added: "domestic... under 24 m length".
Elements		4) Added: "And access ways to a small vessel."
Performance Criteria	Removed 3a Removed 3b	2d) Replaced: "by the responsible officer" to "design limitations and the Master". 4f) New
Range of Variables	2c4): Removed 2c5): Removed 2e1): Removed 2e3): Removed 2e6): Removed 3aa1): Removed "ISM Code". 4aa1): Removed "ISM Code".	2a) Replaced: "or international commercial vessel" with "domestic commercial vessel under 24 m in length." 2bb7) New 2cc5) New 2ff7) New 2ff8) New 2gg10) – 14. New 2ii5) New 3a) Replaced: "Documentation/records" with "information and documentation". 3aa3) New 3aa6) New
Evidence Guide	3l): Removed 5bb2): Removed "ISM Code"	1aa6) New 4aa1) Added: "participate." 5aa3) New

Unit		TDMMF4502A (New unit)
Title		Operating Breathing Apparatus on Board a Vessel
Unit		TDMMH1202A (New unit)
Title		Plan and navigate a short voyage within inshore limits
Unit		TDMMR5402A (New unit)
Title		Carry out refuelling and fuel transfer operations
Unit		TDMMU502A (New unit)
Title		Ensure Compliance with environmental considerations in a small domestic vessel.

Maritime Sector Qualifications Framework

DECK OPERATIONS

AQF	SUGGESTED QUALIFICATION TITLE	PROFILES COVERED		
		<i>MARITIME FUNCTIONAL CATEGORY</i>		
		<i>Management</i>	<i>Operational</i>	<i>Support</i>
AQF 6	Advanced Diploma in Transport and Distribution (Maritime Operations)	Master (Class 1) and (Class 2)	Chief Mate	
AQF 5	Diploma in Transport and Distribution (Maritime Operations)	Master (Class 3)	Off in charge of Nav Watch	
AQF 4	Certificate IV in Transport and Distribution (Maritime Operations)	Master (Class 4)		
AQF 3	Certificate III in Transport and Distribution (Maritime Operations)	Master (Class 5)	Coxswain (+options)	Integrated Rating
AQF 2	Certificate II in Transport and Distribution (Maritime Operations)		Coxswain (basic)	GP Deckhand (+ options)
AQF 1	Certificate I in Transport and Distribution (Maritime Operations)			GP Deckhand (basic) Basic entry skills

MARINE ENGINEERING

AQF	SUGGESTED QUALIFICATION TITLE	PROFILES COVERED		
		<i>MARITIME FUNCTIONAL CATEGORY</i>		
		<i>Management</i>	<i>Operational</i>	<i>Support</i>
AQF 6	Advanced Diploma in Transport and Distribution (Marine Engineering)	Eng (Class 1)		
AQF 5	Diploma in Transport and Distribution (Marine Engineering)	Eng (Class 2)	Off of Eng Watch	
AQF 4	Certificate IV in Transport and Distribution (Marine Engineering)	Eng (Class 3)	MED 1	
AQF 3	Certificate III in Transport and Distribution (Marine Engine Driving)		MED 2	
AQF 2	Certificate II in Transport and Distribution (Marine Engine Driving)		MED 3	
AQF 1				Basic entry skills

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate I in Transport & Distribution (Maritime Operations)

Rationale:

An entry level qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 1.

"Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities most of which may be routine and predictable. Applications may include a variety of employment-related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group."

Qualification Contents:

FIELD		UNIT	
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties
F	Operational Quality and Safety	TDMMF701B	Observe safe working practices and procedures on board a vessel
		TDMMF801B	Comply with emergency procedures on board a vessel
		TDMMF901A	Fight and extinguish fires
		TDMMF1001A	Provide first aid
		TDMMF1101A	Survive at sea in the event of vessel abandonment
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
		TDMMF4502A	Operate breathing apparatus on board a vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
L	Human Resources	TDMML201A	Contribute to effective human relationships on board a vessel
R	Carry Out Operations on Equipment and Systems	TDMMR4301A	Assist in mooring and anchor handling activities

Requirements for completion of the Qualification:

A successful outcome of pre-sea entry-level units is as follows:

- TDTMME101A – Understand orders and be understood in relation to shipboard duties
- TDMMF701B – Observe safe working practices and procedures on board a vessel
- TDMMF801B – Comply with emergency procedures on board a vessel
- TDMMF1001A – Provide first aid
- TDMMF1101A – Survive at sea in the event of vessel abandonment
- TDMMF1201A – Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMML201A – Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

PLUS

1 unit chosen from the list above and/or relevant units from any other endorsed Training Package. An indicative list appears at the rear of this Training Package.

It should be noted that training and assessing units TDMMF801B 'Comply with emergency procedures', TDMMF901A 'Fight and extinguish fires', TDMMF1101A 'Survive at sea in the event of vessel abandonment', and TDMMF1201A 'Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire' will usually be covered holistically by Registered Training Organisations during training and assessment of 'elements of shipboard safety'. This combination of units is equivalent to unit SFISHIP211A 'Take emergency action on board a vessel' in the Seafood Industry Training Package.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate II in Transport & Distribution (Maritime Operations)

Rationale:

An operational qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned AQF Level 2.

"Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes. Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team."

Qualification Contents:

FIELD		UNIT	
C	Manoeuvring	SROYSB001A	Use basic skills to sail a small boat in controlled conditions
		SROYSB002A	Sail a small boat in light to moderate conditions using enhanced skills
		SROYSB003A	Sail a small boat in moderate conditions using enhanced skills
B	Equipment Checking and Maintenance	TDTMMB601A	Monitor condition and seaworthiness of a small vessel
C	Manoeuvre Vessel	TDMMC701B	Apply seamanship skills and techniques when operating a small domestic vessel
		TDMMC901B	Manoeuvre a domestic vessel of less than 12 metres in length operating within inshore limits
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties
		TDMME501A	Transmit and receive information by marine radio or telephone
F	Operational Quality and Safety	TDMMF201A	Respond to navigational emergencies
		TDMMF701B	Observe safe working practices and procedures on board a vessel
		TDMMF801B	Comply with emergency procedures on board a vessel
		TDMMF901A	Fight and extinguish fires
		TDMMF1001A	Provide first aid
		TDMMF1101A	Survive at sea in the event of vessel abandonment
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
		TDMMF3201B	Apply domestic regulations when operating a small vessel
		TDMMF4502A	Operate breathing apparatus on board a vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
		THHBKA04A	Clean and maintain premises
		THHCOR03A	Follow health, safety and security procedures
H	Navigation	TDMMH701A	Apply weather information when navigating a vessel
		TDMMH801A	Plan and navigate an inshore passage
		TDMMH1202A	Plan and navigate a short voyage within inshore limits
		TDMMH1302A	Apply weather information when navigating a small domestic vessel
		SFISHIP202A	Contribute to safe navigation
L	Human Resources	TDMLL201A	Contribute to effective human relationships on board a vessel

Qualification Contents (continued):

FIELD		UNIT	
R	Carry Out Operations on Equipment and Systems	TDMMR3001A	Operate and carry out basic maintenance on small vessel marine propulsion systems
		TDMMR3101A	Operate and carry out basic maintenance on auxiliary systems
		TDMMR3201A	Operate and carry out basic routine maintenance on extra low voltage electrical systems, starter motors and alternators
		TDMMR4301A	Assist in mooring and anchor handling activities
		TDMMR5402A	Carry out refuelling and fuel transfer operations
		THHBKA01A	Organise and prepare food
		THHBCC00B	Prepare sandwiches
		THHADCC02A	Plan, prepare and display a buffet
U	Environment	TDMMU502A	Ensure compliance with environmental considerations in a small domestic vessel

Requirements for completion of the Qualification:

A successful outcome of pre-sea entry-level units is as follows:

- TDTMME101A – Understand orders and be understood in relation to shipboard duties
- TDMMF701B – Observe safe working practices and procedures on board a vessel
- TDMMF801B – Comply with emergency procedures on board a vessel
- TDMMF1001A – Provide first aid
- TDMMF1101A – Survive at sea in the event of vessel abandonment
- TDMMF1201A – Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMMML201A – Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

PLUS

11 units chosen from the list above and/or relevant units from any other endorsed Training Package. An indicative list appears at the rear of this Training Package.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* and/or *TDMMF5302A Fight and extinguish fires on board a commercial vessel* is **automatically excluded** as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

Note 2: Only **one** (the most appropriate for the trainee's circumstances) of the three possible **navigational** units should be counted as part of the Certificate II qualification requirements - *TDMMH801A Plan and navigate an inshore passage* (recommended for Master 5 contexts), *TDMMH1202A Plan and navigate a short voyage within inshore limits* (recommended for Coxswain contexts), or *SFISHIP202A Contribute to safe navigation* (from the Seafood Training Package)

Note 3: Only **one** (the most appropriate for the trainee's circumstances) of the two possible **weather** units should be counted as part of the Certificate II qualification requirements - *TDMMH701A - Apply weather information when navigating a vessel* (recommended for Master 5 contexts) or *TDMMH1302A - Apply weather information when navigating a small domestic vessel* (recommended for Coxswain contexts)

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate III in Transport & Distribution (Maritime Operations)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned AQF Level 3.

"Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the selection of equipment, services or contingency measures and within known time constraints. Applications may involve some responsibility for others. Participation in teams including group or team coordination may be involved."

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDMMMA1101A	Maintain the stability of a vessel using simplified stability information
B	Equipment Checking and Maintenance	TDMMMB0101B	Perform routine remedial, preventative and survey maintenance tasks on a vessel
		TDMMMB601A	Monitor condition and seaworthiness of a small vessel
		TDMMMB701A	Slip vessel and maintain hull
		TDMMMB2001A	Assist engineer in the routine maintenance of main propulsion and ancillary machinery and systems
C	Manoeuvre Vessel	TDMMMC701B	Apply seamanship skills and techniques when operating a small domestic vessel
		TDMMMC801A	Manoeuvre a vessel less than 24 metres in length within inshore limits
		TDMMMC901B	Manoeuvre a vessel less than 12 metres in length operating within inshore limits
		TDMMMC1001B	Steer a domestic vessel under the direction of the Officer in Charge of the Watch
E	Communications	TDMMME101A	Understand orders and be understood in relation to shipboard duties
		TDMMME5001	Transmit and receive information by marine radio or telephone
F	Operational Quality and Safety	TDMMMF201A	Respond to navigational emergencies
		TDMMMF701B	Observe safe working practices and procedures on board a vessel
		TDMMMF801B	Comply with emergency procedures on board a vessel
		TDMMMF901A	Fight and extinguish fires
		TDMMMF1001A	Provide first aid
		TDMMMF1101A	Survive at sea in the event of vessel abandonment
		TDMMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
		TDMMMF1801A	Apply medical first aid on board a vessel
		TDMMMF1901A	Operate life-saving appliances
		TDMMMF2301A	Operate emergency equipment and apply emergency procedures
		TDMMMF3201B	Apply domestic regulations when operating a small vessel
		TDMMMF35 01A	Contribute to maintaining a safe watch
		TDMMMF4301A	Carry out fast rescue craft operations
TDMMMF4502A	Operate breathing apparatus on board a vessel		

Qualification Contents (continued):

FIELD		UNIT	
		TDMMF4702A	Contribute to maintaining a safe watch on a domestic vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
		BSXFMI409A	Implement and monitor continuous improvement systems and processes
		BSXFMI306A	Manage workplace information
		BSXFMI307A	Manage quality customer service
		THHBKA04A	Clean and maintain premises
		THHCOR03A	Follow health, safety and security procedures
H	Navigation	TDMMH501A	Use radar and other electronic aids to maintain safe navigation
		TDMMH701A	Apply weather information when navigating a vessel
		TDMMH801A	Plan and navigate an inshore passage
		TDMMH1102A	Use radar to maintain safe navigation
L	Human Resources	TDMLL201A	Contribute to effective human relationships on board a vessel
		TDMLL301A	Establish and maintain a harmonious workplace environment
R	Carry Out Operations on Equipment and Systems	TDMMR101A	Operate and maintain steering gear arrangements
		TDMMR201A	Use and maintain deck machinery installed on a vessel
		TDMMR301A	Operate fuel, fresh and ballast water, bilge and fire pumping systems installed in a vessel
		TDMMR3001A	Operate and carry out basic service checks on small vessel marine propulsion systems
		TDMMR3101A	Operate and carry out basic servicing on auxiliary systems
		TDMMR3201A	Operate and carry out basic routine servicing of marine extra low and low voltage electrical systems
		TDMMR3301A	Perform routine rigging and lifting operations on board a vessel
		TDMMR3401A	Operate deck machinery
		TDM MR4301A	Assist in mooring and anchor handling activities
		TDMMR4401A	Assist in completion of operations and maintenance documentation
		TDMMR4501A	Provide support in completing cargo and bunkering operations
		TDMMR46 01A	Assist in basic welding, cutting and machining operations on a vessel
		TDMMR4701A	Use and care for hand and power tools carried on a vessel
		TDMMR5001A	Carry out basic food handling, preparation, stock control and storage on an off-shore support vessel or rig
		TDMMR5101A	Carry out windlass operations on a rig
		TDMMR5201A	Carry out dogging and cargo handling operations at a rig
		TDMMR5301A	Carry out anchor handling, towage and supply duties at a rig
		TDMMR5502A	Perform rigging and lifting operations on board a small domestic vessel
		THHBKA01A	Organise and prepare food
		THHBCC00B	Prepare sandwiches
THHADCC02A	Plan, prepare and display a buffet		

Qualification Contents (continued):

FIELD		UNIT	
U	Environment	TDMMU401A	Ensure compliance with pollution prevention measures
		TDMMU502A	Ensure compliance with environmental considerations in a small domestic vessel

Requirements for completion of the Qualification:

A successful outcome of pre-sea entry-level units is as follows:

- TDTMME101A – Understand orders and be understood in relation to shipboard duties
- TDMMF701B – Observe safe working practices and procedures on board a vessel
- TDMMF801B – Comply with emergency procedures on board a vessel
- TDMMF1001A – Provide first aid
- TDMMF1101A – Survive at sea in the event of vessel abandonment
- TDMMF1201A – Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMML201A – Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

PLUS

17 units chosen from the list above and/or relevant units from any other endorsed Training Package. An indicative list appears at the rear of this Training Package.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* and/or *TDMMF5302A - Fight and extinguish fires on board a commercial vessel* is **automatically excluded** as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

Note 2: Only **one** (the most appropriate for the trainee's circumstances) of the two possible **radar** units should be counted as part of the Certificate III qualification requirements - *TDMMH501A - Use radar and other electronic aids to maintain safe navigation* (recommended for contexts in which ARPA is used) or *TDMMH1102A - Use radar to maintain safe navigation* (recommended for contexts in which ARPA is not used). If *TDMMH501A* is confirmed and counted within qualification requirements *TDMMH1102A* is **automatically excluded** as the competence requirements of *TDMMH1102A* are completely incorporated into *TDMMH501A*.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate IV in Transport & Distribution (Maritime Operations)

Meeting the occupational requirements of a Master (Class 4)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 4.

"Performance of a broad range of skilled applications including requirements to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others."

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDMMA901A	Prepare a cargo plan for cargo loading and unloading operations
		TDMMA1201A	Manage stress and dynamic factors affecting vessel's stability
B	Equipment Checking and Maintenance	TDMMB601A	Monitor condition and seaworthiness of a small vessel
C	Manoeuvre Vessel	TDMMC501A	Manoeuvre a vessel less than 80 metres in length in any prevailing conditions
		TDMMC601A	Manage a propulsion unit using the appropriate engine systems and support services
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties
		TDMME501A	Transmit and receive information by marine radio or telephone
		TDMME801B	Transmit and receive information by GMDSS sub-systems and equipment on a vessel
F	Operational Quality and Safety	TDMMF201A	Respond to navigational emergencies
		TDMMF701B	Observe safe working practices and procedures on board a vessel
		TDMMF801B	Comply with emergency procedures on board a vessel
		TDMMF901A	Fight and extinguish fires
		TDMMF1001A	Provide first aid
		TDMMF1101A	Survive at sea in the event of vessel abandonment
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
		TDMMF1301A	Manage marine fire fighting and prevention activities
		TDMMF1801A	Apply medical first aid on board a vessel
		TDMMF2001A	Prevent, control and fight fires on board a vessel
		TDM MF3201B	Apply domestic regulations when operating a small vessel
		TDMMF3301A	Execute watchkeeping arrangements and procedures
		TDMMF4502A	Operate breathing apparatus on board a vessel
		TDMMF4802A	Execute watchkeeping arrangements and procedures on a small domestic vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
		BSXFMI409A	Implement and monitor continuous improvement systems and processes
BSXFMI409A	Manage workplace information		
H	Navigation	TDMMH201A	Determine position of the vessel and the accuracy of the resultant position
		TDMMH601A	Plan and conduct a coastal passage and determine position
		TDMMH501A	Use radar and other electronic aids to maintain safe navigation
		TDMMH701A	Apply weather information when navigating a small vessel

Qualification Contents:

FIELD		UNIT	
L	Human Resources	TDMML201A	Contribute to effective human relationships on board a vessel
		TDMML301A	Establish and maintain a harmonious workplace environment
N	Assessment	BSZ402A	Conduct assessment
U	Environment	TDMMU401A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful outcome of pre-sea entry-level units is as follows:

- TDTMME101A – Understand orders and be understood in relation to shipboard duties
- TDMMF701B – Observe safe working practices and procedures on board a vessel
- TDMMF801B – Comply with emergency procedures on board a vessel
- TDMMF1001A – Provide first aid
- TDMMF1101A – Survive at sea in the event of vessel abandonment
- TDMMF1201A – Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMML201A – Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

PLUS

20 units chosen from the list above and/or relevant units from any other endorsed Training Package. An indicative list appears at the rear of this Training Package.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* and/or *TDMMF5302A - Fight and extinguish fires on board a commercial vessel* is **automatically excluded** as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Diploma of Transport & Distribution (Maritime Operations)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 5.

"The self-directed application of knowledge and skills, with substantial depth in some areas where judgement is required in planning and selecting appropriate equipment, services and techniques for self and others. Applications involve participation in development of strategic initiatives, as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team coordination and management may be involved.

Qualification Contents:

FIELD	UNIT		
A	Handling Cargo and Vessel Stability	TDMMA701A	Monitor the loading, stowage, securing and unloading of cargoes
		TDMMA801A	Monitor the care of cargoes during the voyage
B	Equipment Checking and Maintenance	TDMMB401A	Maintain seaworthiness of vessel
		TDMMB501A	Manage the maintenance of the vessel
C	Manoeuvre Vessel	TDMMC301A	Manoeuvre the vessel in normal conditions
		TDMMC401A	Manoeuvre the vessel and operate small power plants
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties
		TDMME201A	Communicate using standard marine navigational vocabulary
		TDMME301A	Transmit and receive information by visual signalling
		TDMME501A	Transmit and receive information by marine radio or telephone
		TDMME801B	Transmit and receive information by GMDSS sub-systems and equipment on a vessel
F	Operational Quality and Safety	TDMMF201A	Respond to navigational emergencies
		TDMMF301A	Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDMMF701B	Observe safe working practices and procedures on board a vessel*
		TDMMF801B	Comply with emergency procedures on board a vessel*
		TDMMF901A	Fight and extinguish fires*
		TDMMF1001A	Provide first aid*
		TDMMF1101A	Survive at sea in the event of vessel abandonment*
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDMMF1301A	Manage marine fire-fighting and prevention activities
		TDMMF1401A	Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers
		TDMMF1501A	Plan and implement special safety, maintenance and emergency procedures for chemical tankers
		TDM MF1601A	Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDM MF1701A	Respond to distress signal at sea
		TDM MF1801A	Apply medical first aid on board a vessel
		TDM MF19 01A	Operate lifesaving appliances
TDM MF20 01A	Prevent, control and fight fires on board a vessel		
TDMMF2101A	Control safe access to and on vessel		

Qualification Contents (continued):

FIELD		UNIT	
F	Operational Quality and Safety (continued)	TDMMF2901A	Maintain a safe navigational watch on a coastal voyage
		TDMMF3001A	Maintain a safe navigational watch
		TDMMF4301A	Carry out fast rescue craft operations
		TDMMF4502A	Operate breathing apparatus on board a vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
		BSXFMF505A	Manage operations to achieve planned outcomes
		BSXFMF509A	Implement and monitor continuous improvement systems and processes
H	Navigation	TDMMH401A	Plan and conduct a passage and determine position
		TDMMH501A	Use radar and other electronic aids to maintain safe navigation
		TDMMH601A	Plan and conduct a coastal passage and determine position
L	Human Resources	TDMLL201A	Contribute to effective human relationships on board a vessel*
		BSXFMF504A	Participate in, lead and facilitate work teams
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
U	Environment	TDMMU401A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 20 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA and/or a marine authority is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* and/or *TDMMF5302A - Fight and extinguish fires on board a commercial vessel* is **automatically excluded** as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

Note 2: Only **one** (the most appropriate for the trainee's circumstances) of the two possible **watchkeeping** units should be counted as part of the Diploma qualification requirements - *TDMMF2901A Maintain a safe navigational watch on a coastal voyage* (recommended for contexts involving **coastal** voyages only) or *TDMMF3001A Maintain a safe navigational watch* (recommended for contexts involving **any** voyages)

Note 3: Only **one** (the most appropriate for the trainee's circumstances) of the two possible **navigation** units should be counted as part of the Diploma qualification requirements - *TDMMH601A Plan and conduct a coastal passage and determine position* (recommended for contexts involving **coastal** voyages only) or *TDMMH401A Plan and conduct a passage and determine position* (recommended for contexts involving **any** voyages including coastal voyages)

CHARACTERISTICS OF THE QUALIFICATION

Title:

Advanced Diploma of Transport & Distribution (Maritime Operations)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 6.

"The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved. Significant judgement is required in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures."

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDMMA101A	Plan and ensure safe loading, stowage, securing and unloading of cargo
		TDMMA201A	Plan and ensure safe care of cargo during the voyage
		TDMMA301A	Plan and monitor the carriage of dangerous cargoes
		TDMMA401A	Manage procedures for the handling, loading and discharging of liquefied gas cargoes
		TDMMA501A	Manage procedures for the handling, loading and discharging of chemical cargoes
		TDMMA601A	Manage procedures for the handling, loading and discharging of oil cargoes
		TDMMA701A	Monitor the loading, stowage, securing and unloading of cargoes
		TDMMA801A	Monitor the care of cargoes during the voyage
		TDMMA1001A	Control trim, stability and stress
		TDMMA1601A	Manage loading and embarkation procedures on roll-on roll-off vessels
C	Manoeuvre Vessel	TDMMC101A	Manoeuvre and handle a vessel of 500 tonnage or more in <u>all</u> conditions
		TDMMC201A	Operate remote controls of propulsion plant and engineering systems and procedures
		TDMMC301A	Manoeuvre the vessel in normal conditions
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties*
		TDMME201A	Communicate using standard marine navigational vocabulary
		TDMME301A	Transmit and receive information by visual signalling
		TDMME501A	Transmit and receive information by marine radio or telephone
		TDMME801B	Transmit and receive information by GMDSS sub-systems and equipment on a vessel
F	Operational Quality and Safety	TDMMF101A	Assist in research and rescue operations
		TDMMF201A	Respond to navigational emergencies
		TDMMF301A	Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDMMF401A	Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDMMF501B	Develop emergency and damage control plans and handle emergency situations on board a vessel
		TDMMF601A	Organise and manage the provision of medical care on board a vessel
		TDMMF701B	Observe safe working practices*
		TDMMF801B	Comply with emergency procedures*
		TDMMF901A	Fight and extinguish fires*
		TDMMF1001A	Provide first aid*
		TDMMF1101A	Survive at sea in the event of vessel abandonment*
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDMMF1301A	Manage marine fire-fighting and prevention activities
		TDMMF1401A	Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers

Qualification Contents (continued):

FIELD		UNIT	
F	Operational Quality and Safety (continued)	TDMMF1601A	Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDMMF1701A	Respond to distress signal at sea
		TDMMF1801A	Apply medical first aid on board a vessel
		TDMMF1901A	Operate lifesaving appliances
		TDTMF2001A	Prevent, control and fight fires on board a vessel
		TDMMF2601A	Establish watchkeeping arrangements and procedures
		TDMMF3001A	Maintain a safe navigational watch
		TDMMF3701A	Manage vessel operations
		TDMMF4301A	Carry out fast rescue craft operations
		TDMMF4401A	Apply safety regulations on roll-on roll-off vessels
		TDMMF4502A	Operate breathing apparatus on board a vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
H	Navigation	TDMMH101A	Plan a voyage and conduct navigation
		TDMMH201A	Determine position of the vessel and the accuracy of the resultant position
		TDMMH301A	Manage safe navigation through the use of radar and other navigational aids
		TDMMH901A	Forecast weather and oceanographic conditions
		TDMMH1001A	Navigate a high speed vessel
L	Human Resources	TDMML101A	Organise and manage the crew
		TDMML201A	Contribute to effective human relationships on board a vessel
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
U	Environment	TDMMU101A	Monitor compliance with legislative requirements and measures to ensure protection of the marine environment
		TDMMU401A	Ensure compliance with pollution prevention measures

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 34 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* and/or *TDMMF5302A - Fight and extinguish fires on board a commercial vessel* is **automatically excluded** as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate II in Transport & Distribution (Marine Engine Driving)

Rationale:

An operational qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 2.

"Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes. Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team."

Qualification Contents:

FIELD		UNIT	
B	Equipment Checking and Maintenance	TDMMB1901A	Carry out basic hull maintenance
		TDMMB3601A	Prepare a small vessel's machinery for sea
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties
F	Operational Quality and Safety	TDMMF701B	Observe safe working practices and procedures on board a vessel
		TDMMF801B	Comply with emergency procedures on board a vessel
		TDMMF901A	Fight and extinguish fires
		TDMMF1001A	Provide first aid
		TDMMF1101A	Survive at sea in the event of vessel abandonment
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
		TDMMF3901A	Maintain running log including fuel calculations and written reports
		TDMMF4502A	Operate breathing apparatus on board a vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
L	Human Resources	TDMML201A	Contribute to effective human relationships on board a vessel
R	Carry Out Operations on Equipment and Systems	TDMMR1801A	Operate deck machinery installed on a small vessel
		TDMMR1901A	Safely handle and stow explosive and flammable materials
		TDMMR3001A	Operate and carry out basic service checks on small vessel marine propulsion systems
		TDMMR3101A	Operate and carry out basic servicing on auxiliary systems
		TDMMR3201A	Operate and carry out basic routine servicing of marine extra low and low voltage electrical systems
		TDMMR5402A	Carry out refueling and fuel transfer operations
U	Environment	TDMMU401A	Ensure compliance with pollution prevention measures
		TDMMU502A	Ensure compliance with environmental considerations in a small domestic vessel

Requirements for completion of the Qualification:

A successful outcome of pre-sea entry-level units is as follows:

- TDMMME101A – Understand orders and be understood in relation to shipboard duties
- TDMMF701B – Observe safe working practices and procedures on board a vessel
- TDMMF801B – Comply with emergency procedures on board a vessel
- TDMMF1001A – Provide first aid
- TDMMF1101A – Survive at sea in the event of vessel abandonment
- TDMMF1201A – Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMML201A – Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

PLUS

9 units chosen from the list above and/or relevant units from any other endorsed Training Package. An indicative list appears at the rear of this Training Package.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* **and/or** *TDMMF5302A - Fight and extinguish fires on board a commercial vessel* is automatically excluded as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate III in Transport & Distribution (Marine Engine Driving)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 3.

"Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the selection of equipment, services or contingency measures and within known time constraints. Applications may involve some responsibility for others. Participation in teams including group or team coordination may be involved."

Qualification Contents:

FIELD	UNIT	
B	Equipment Checking and Maintenance	TDMMB2901A Recognise and correct deteriorated fittings and machinery
E	Communications	TDMME101A Understand orders and be understood in relation to shipboard duties
F	Operational Quality and Safety	TDTMF701B Observe safe working practices and procedures on board a vessel
		TDMMF801B Comply with emergency procedures on board a vessel
		TDMMF901A Fight and extinguish fires
		TDMMF1001A Provide first aid
		TDMMF1101A Survive at sea in the event of vessel abandonment
		TDMMF1201A Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
		TDMMF2701A Prevent, control and fight fires on board a small vessel
		TDMMF4001A Carry out basic operational engineering calculations
		TDMMF4502A Operate breathing apparatus on board a vessel
		TDMMF5302A Fight and extinguish fires on board a commercial vessel
		BSXFMI409A Implement and monitor continuous improvement systems and processes
		BSXFMI306A Manage workplace information
H	Navigation	TDMMH1302A Apply weather information when navigating a small domestic vessel
L	Human Resources	TDMLL201A Contribute to effective human relationships on board a vessel
		TDMLL301A Establish and maintain a harmonious workplace environment
		BSXFMI304A Participate in, lead and facilitate work teams
R	Carry Out Operations on Equipment and Systems	TDMMR1901A Safely handle and stow explosive and flammable materials
		TDMMR2701A Operate and maintain marine internal combustion engines on vessels of 750 kW propulsion power or less
		TDMMR2801A Operate and maintain auxiliary systems on vessels up to 750 kW propulsion power
		TDMMR2901A Operate and maintain marine low and medium voltage electrical systems
		TDMMR5402A Carry out refuelling and fuel transfer operations
U	Environment	TDMMU401A Ensure compliance with pollution prevention measures
		TDMMU502A Ensure compliance with environmental considerations in a small domestic vessel

Requirements for completion of the Qualification:

A successful outcome of pre-sea entry-level units is as follows:

- TDMME101A – Understand orders and be understood in relation to shipboard duties
- TDTMF701B – Observe safe working practices and procedures on board a vessel
- TDMMF801B – Comply with emergency procedures on board a vessel
- TDMMF1001A – Provide first aid
- TDMMF1101A – Survive at sea in the event of vessel abandonment
- TDMMF1201A – Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMLL201A – Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

PLUS

13 units chosen from the list above and/or relevant units from any other endorsed Training Package. An indicative list appears at the rear of this Training Package.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* **and/or** *TDMMF5302A - Fight and extinguish fires on board a commercial vessel* is automatically excluded as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Certificate IV in Transport & Distribution (Marine Engineering)

Rationale:

A management qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 4.

"Performance of a broad range of skilled applications including requirements to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others."

Qualification Contents:

FIELD		UNIT	
B	Equipment Checking and Maintenance	TDMMB3101A	Organise maintenance and repairs on a small vessel
		TDMMB3501A	Employ Damage Control techniques for hull damage.
		TDMMB3701A	Fabricate simple shipboard components
		TDMMB3801A	Dismantle, inspect, repair and reassemble vessel machinery
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties
F	Operational Quality and Safety	TDMMF401A	Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDMMF501B	Develop emergency and damage control plans and handle emergency situations on board a vessel
		TDMMF701B	Observe safe working practices and procedures on board a vessel
		TDMMF801B	Comply with emergency procedures on board a vessel
		TDMMF901A	Fight and extinguish fires
		TDMMF1001A	Provide first aid
		TDMMF1101A	Survive at sea in the event of vessel abandonment
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
		TDMMF1301A	Manage fire fighting and prevention activities
		TDMMF1801A	Apply medical first aid on board a vessel
		TDMMF1901A	Operate lifesaving appliances
		TDMMF2701A	Prevent, control and fight fires on board a small vessel
		TDMMF3801A	Establish engine room watchkeeping procedures on vessels of less than 3,000 propulsion power
		TDMMF4101A	Carry out engineering calculations related to maintenance and operations
		TDMMF4502A	Operate breathing apparatus on board a vessel
		TDMMF5302A	Fight and extinguish fires on board a commercial vessel
		BSXFMI405A	Manage operations to achieve planned outcomes
		BSXFMI406A	Manage workplace information
		BSXFMI409A	Implement and monitor continuous improvement systems and processes
		BSXFMI410A	Facilitate and capitalise on change and innovation
L	Human Resources	TDMLL201A	Contribute to effective human relationships on board a vessel
		BSXFMI404A	Participate in, lead and facilitate work teams
		BSXFMI403A	Establish and manage effective workplace relationships
N	Assessment	BSZ402A	Conduct assessment

Qualification Contents (continued):

FIELD	UNIT	
R	Carry Out Operations on Equipment and Systems	
	TDMMR1901A	Safely handle and stow explosive and flammable materials
	TDMMR2101A	Operate and maintain engines, machinery and auxiliary power sources on vessels of less than 3,000 propulsion power
	TDMMR2201A	Operate and maintain boiler systems
	TDMMR2301A	Operate and maintain batteries, starter motors and power distribution systems
	TDMMR2401A	Operate and marine internal combustion engines and propulsion transmission systems
	TDMMR2501A	Operate and maintain auxiliary machinery systems, including steering gear and refrigeration systems
	TDMMR2601A	Test, maintain and operate marine electrical and control equipment.
	MEM 18.1 A	Use hand tools
	MEM 18.2 A	Use power tools/hand held operations
	MEM 5.1 A	Manual soldering / desoldering electrical, electronic components
	MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)
	MEM 5.6 A	Perform brazing and/or silver soldering
	MEM 5.7 A	Manual heating thermal cutting and gouging
	MEM 5.15 A	Weld using manual metal arc welding process
	MEM 7.5 A	Perform general machining

Requirements for completion of the Qualification:

A successful outcome of pre-sea entry-level units is as follows:

- TDTMME101A – Understand orders and be understood in relation to shipboard duties
- TDMMF701B – Observe safe working practices and procedures on board a vessel
- TDMMF801B – Comply with emergency procedures on board a vessel
- TDMMF1001A – Provide first aid
- TDMMF1101A – Survive at sea in the event of vessel abandonment
- TDMMF1201A – Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
- TDMML201A – Contribute to effective human relationships on board a vessel

PLUS

Either TDMMF901A or TDMMF5302A depending upon whether an STCW endorsed or NSCV endorsed outcome is sought.

PLUS

17 units chosen from the list above and/or relevant units from any other endorsed Training Package. An indicative list appears at the rear of this Training Package.

Note 1: In considering the requirements for this qualification, it is important to recognise that if the achievement of competence in *TDMMF901A - Fight and extinguish fires* has been confirmed and counted within qualification requirements, recognition within the qualification for *TDMMF4502A - Operate breathing apparatus on board a vessel* and/or *TDMMF5302A - Fight and extinguish fires on board a commercial vessel* is **automatically excluded** as the competence requirements of *TDMMF4502A* and *TDMMF5302A* are completely incorporated into *TDMMF901A*.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Diploma of Transport & Distribution (Marine Engineering)

Rationale:

An operational qualification for the Maritime sector of the Transport and Distribution Industry. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 5.

"The self-directed application of knowledge and skills, with substantial depth in some areas where judgement is required in planning and selecting appropriate equipment, services and techniques for self and others. Applications involve participation in development of strategic initiatives, as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team coordination and management may be involved.

Qualification Contents:

FIELD	UNIT	
A	Handling Cargo and Vessel Stability	TDMMA1001A Control trim, stability and stress
B	Equipment Checking and Maintenance	TDMMB401A Maintain seaworthiness of vessel
		TDMMB1201A Fault-find, dismantle, maintain and repair shipboard plant and equipment
		TDMMB1301A Carry out shipboard fabrication and repair operations
		TDMMB1501A Detect and identify the cause of machinery malfunctions and repair faults on vessels over 750 kW of propulsion power
		TDMMB1601A Organize safe maintenance and repair procedures on vessels over 750 kW of propulsion power
		TDMMB1701A Test, detect faults and maintain and restore electrical / electronic control equipment to operating condition on vessels over 750 kW of propulsion power
E	Communications	TDMME101A Understand orders and be understood in relation to shipboard duties*
		TDMME701A Use English in written and oral form to perform engineering duties
F	Operational Quality and Safety	TDMMF301A Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDMMF401A Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDMMF501B Develop emergency and damage control plans and handle emergency situations on board a vessel
		TDTMF701B Observe safe working practices and procedures on board a vessel*
		TDMMF801B Comply with emergency procedures on board a vessel*
		TDMMF901A Fight and extinguish fires*
		TDMMF1001A Provide first aid*
		TDMMF1101A Survive at sea in the event of vessel abandonment*
		TDMMF1201A Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDMMF1301A Manage marine fire-fighting and prevention activities
		TDMMF1401A Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers
		TDMMF1501A Plan and implement special safety, maintenance and emergency procedures for chemical tankers
		TDMMF1601A Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDMMF1801A Apply medical first aid on board a vessel
		TDMMF1901A Operate lifesaving appliances
		TDMMF2001A Prevent, control and fight fires on board a vessel
TDMMF2201A Maintain safety of engine equipment, systems and services on vessels of unlimited propulsion power		
TDMMF2401A Maintain safety of engine equipment, systems and services on vessels over 750 kW of propulsion power		
TDMMF2501A Ensure safe working practices		

Qualification Contents (continued):

FIELD	UNIT		
F	Operational Quality and Safety (cont.)	TDMMF2601A	Establish watchkeeping arrangements and procedures
		TDMMF3101A	Maintain a safe engineering watch
		TDMMF3701A	Manage vessel operations
		BSXFM1505A	Manage operations to achieve planned outcomes
		BSXFM1506A	Manage workplace information
		BSXFM1509A	Implement and monitor continuous improvement systems and processes
		BSXFM1510A	Facilitate and capitalise on change and innovation
L	Human Resources	TDMM101A	Organise and manage the crew
		TDMM201A	Contribute to effective human relationships on board a vessel*
		BSXFM1504A	Participate in, lead and facilitate work teams
		BSXFM1503A	Establish and manage effective workplace relationships
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
R	Carry Out Operations on Equipment and Systems	TDMMR901A	Operate alternators, generators and control systems to supply shipboard electrical power
		TDMMR1001A	Operate pumping systems and associated control systems
		TDMMR1101A	Operate main and auxiliary machinery and associated control systems
		TDMMR1301A	Operate electrical/electronic control equipment on vessels over 750 kW of propulsion power
		TDMMR1401A	Manage fuel and ballast operations on vessels over 750 kW of propulsion power
		TDMMR1501A	Operate, monitor and evaluate engine performance on vessels over 750 kW of propulsion power
		TDMMR1601A	Plan and schedule operations on vessels over 750 kW of propulsion power
		TDMMR1701A	Start up and shut down main propulsion and auxiliary machinery and associated systems on vessels over 750 kW of propulsion power
		MEM 18.1 A	Use hand tools
		MEM 18.2 A	Use power tools/hand held operations
		MEM 5.1 A	Manual soldering/desoldering electrical, electronic components
		MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)
		MEM 5.6 A	Perform brazing and/or silver soldering
		MEM 5.7 A	Manual heating thermal cutting and gouging
		MEM 5.15 A	Weld using manual metal arc welding process
		MEM 7.5 A	Perform general machining
		U	Environment
TDMMU401A	Ensure compliance with pollution prevention measures		

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 20 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

CHARACTERISTICS OF THE QUALIFICATION

Title:

Advanced Diploma of Transport & Distribution (Marine Engineering)

Rationale:

A qualification for the Maritime sector of the Transport and Distribution. Successful completion will require competency in units that relate to work defined as aligned at AQF Level 6.

"The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved. Significant judgement is required in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures."

Qualification Contents:

FIELD		UNIT	
A	Handling Cargo and Vessel Stability	TDMMA1001A	Control trim, stability and stress
B	Equipment Checking and Maintenance	TDMMB801A	Detect and identify the cause of machinery malfunctions and repair faults on vessels of unlimited propulsion power
		TDMMB901A	Organize safe maintenance and repair procedures on vessels of unlimited propulsion power
		TDMMB1001A	Test, detect faults, maintain and restore electrical machinery and electronic control equipment to operating condition on vessels of unlimited propulsion power
E	Communications	TDMME101A	Understand orders and be understood in relation to shipboard duties*
		TDMME701A	Use English in written and oral form to perform engineering duties
F	Operational Quality and Safety	TDMMF301A	Monitor compliance with legislative requirements and measures to ensure safety of life at sea
		TDMMF401A	Maintain the operational condition of life-saving, fire-fighting and other safety systems
		TDMMF501B	Develop emergency and damage control plans and handle emergency situations on board a vessel
		TDMMF701B	Observe safe working practices and procedures on board a vessel*
		TDMMF801B	Comply with emergency procedures on board a vessel*
		TDMMF901A	Fight and extinguish fires*
		TDMMF1001A	Provide first aid*
		TDMMF1101A	Survive at sea in the event of vessel abandonment*
		TDMMF1201A	Minimise the risk of fire and maintain a state of readiness to respond to emergency situations involving fire*
		TDMMF1301A	Manage marine fire-fighting and prevention activities
		TDMMF1401A	Plan and implement special safety, maintenance and emergency procedures for liquefied gas tankers
		TDMMF1501A	Plan and implement special safety, maintenance and emergency procedures for chemical tankers
		TDMMF1601A	Plan and implement special safety, maintenance and emergency procedures for oil tankers
		TDMMF22 01A	Maintain safety of engine equipment, systems and services on vessels of unlimited propulsion power
		TDMMF2501A	Ensure safe working practices
		TDMMF2601A	Establish watchkeeping arrangements and procedures
		TDMMF3701A	Manage vessel operations
		BSXFMI505A	Manage operations to achieve planned outcomes
		BSXFMI506A	Manage workplace information
BSXFMI509A	Implement and monitor continuous improvement systems and processes		
		BSXFMI510A	Facilitate and capitalise on change and innovation

Qualification Contents (continued):

FIELD		UNIT	
L	Human Resources	TDMMML101A	Organise and manage the crew
		TDMMML201A	Contribute to effective human relationships on board a vessel*
N	Assessment	BSZ503A	Design and establish the assessment system
		BSZ402A	Conduct assessment
R	Carry Out Operations on Equipment and Systems	TDMMMR401A	Operate electrical machinery and electronic control equipment on vessels of unlimited propulsion power
		TDMMMR501A	Manage fuel, bilge and ballast operations on vessels of unlimited propulsion power
		TDMMMR601A	Operate, monitor and evaluate engine performance on vessels of unlimited propulsion power
		TDMMMR701A	Plan and schedule operations on vessels of unlimited propulsion power
		TDMMMR801A	Start up and shut down main propulsion and auxiliary machinery and associated systems on vessels of unlimited propulsion power
		MEM 18.1 A	Use hand tools
		MEM 18.2 A	Use power tools/hand held operations
		MEM 5.1 A	Manual soldering / desoldering electrical. electronic components
		MEM 5.4 A	Perform routine oxyacetylene welding (fuel gas welding)
		MEM 5.6 A	Perform brazing and/or silver soldering
		MEM 5.7 A	Manual heating thermal cutting and gouging
		MEM 5.15 A	Weld using manual metal arc welding process
		MEM 7.5 A	Perform general machining
U	Environment	TDMMMU101A	Monitor compliance with legislative requirements and measures to ensure protection of the marine environment

Requirements for completion of the Qualification:

A successful assessment outcome of 8 pre sea entry level units (identified by asterisks above) and 23 units chosen from above and/or relevant cross industry units listed in the rear of this Training Package. When packaged together these units need to provide a coherent qualification, inclusive of the competencies necessary to fulfil occupational and regulatory requirements.

Where certification through AMSA is also to be sought, the selection should include all of the units related to certification requirements. This includes the mandatory pre-sea unit requirements shown by an asterisk in the table above.

BSZ503A Design and Establish the Assessment System can only be undertaken if the BSZ40198 Certificate IV in Assessment and Workplace Training or equivalent has been completed.

COMPETENCY STANDARDS

- Are the criteria to be used for any assessment leading to national recognised qualifications
- Are required to provide sufficient detail for a proper assessment of competency
- Must reflect workplace competency needs, they are not a course of training
- Are made of building blocks called units. A collection of units of competency (Competency Standards) needs to cover the full range of work activities within an industry. Sometimes units of competency from other industry sectors may be used to reduce duplication. Assessments will group together relevant units of competency
- Are to be used for assessment of new or existing employees and may assist employees to assess their own skills and knowledge and identify where training is needed
- Need to be able to be used flexibly by enterprises to reflect the different job roles and functions of individuals as well as the different business activities of the enterprise
- Competency Standards are intended to describe industry's perspective of work requirements for the industry sector or across industry.
- Standards describe:
 - The kinds of skills, knowledge and attributes needed to be applied in work activities
 - The indicators that describe when someone performs these activities well
 - What employers and workers describe as required work competence
 - The criteria used for assessment of competency
- Standards are not curriculum documents or training programs. Standards provide a basis for assessment including the recognition of current competency within the National Training Framework.

STRUCTURE AND LAYOUT OF STANDARDS

Each unit of competency consists of:

- Elements
- Performance criteria
- Range of variables
- Evidence guide

Performance Criteria, Range of Variables and Evidence Guides together identify what must be assessed for a unit of competency within the framework provided by the elements statements. Units of Competency may be assessed (and learned) in an integrated fashion with other units of competency.

UNITS OF COMPETENCY

Describe a broad area of performance.

Units of competency must:

- Be transferable and integrate a number of skills
- Define a major skills area of industry
- Relate to realistic work place activities
- Allow contextualisation to particular workplaces, products, work systems and circumstances whilst maintaining transferability

Successful achievement of units of competency would normally require the use of several skills and the application of knowledge, attitudes and values in the workplace.

Contextualisation and customisation must maintain the integrity of the units of competency.

ELEMENTS OF COMPETENCY

Identify and describe actions of outcomes (performances) which are observable. They are the smallest logical, identifiable, discrete sub-groupings of actions and knowledge that make up a unit of competency.

They are the component activities of the unit.

An element defines the skills associated with the unit. Elements provide further information on the scope of the unit of competency.

PERFORMANCE CRITERIA

Outline what people do to display competency.

Performance criteria are as precise as possible.

They:

- Describe evidence that is observable
- Describe only essential aspects of performance
- Refer to the work requirements where practicable
- Describe aspects of work organisations and the overall work role
- Avoid specifying procedures or methods

RANGE OF VARIABLES

Specify the range of contexts and conditions in which the competency is valid. Information must include:

- Legislation, regulations, codes and conventions such as OHS and pollution control regulations, USL Code, AMSA Marine Orders, IMO Conventions and Codes, etc.
- The range of equipment, processes and procedures
- Particular locations and situations
- Requirements arising from enterprise procedures and industrial arrangements

EVIDENCE GUIDES

Cover the required evidence of competency including the critical aspects of a unit that include underpinning knowledge and the relationship of the unit to other units of competency.

The Evidence Guides provide information for assessors and candidates, supplementing information given in the Performance Criteria.

KEY COMPETENCIES

There are also competencies that underlie all work, the Key Competencies. Key competencies are integrated within the units of competency and are allocated to three performance levels.

Key Competencies are seen to have the capacity to assist in the transfer of knowledge and skill to new situations eg. different equipment or software, new processes.

1. *Collecting, analysing and organising information*

The capacity to locate information, sift and sort information in order to select what is required and present it in a useful way, and evaluate both the information itself and the sources and methods to obtain it.

2. *Communicating ideas and information*

The capacity to communicate effectively with others using a range of spoken, written, graphic and other non-verbal means of expression.

3. *Planning and organising activities*

The capacity to plan and organise one's own work activities, including making good use of time and resources, sorting out priorities and monitoring one's own performance.

4. Working with others in teams

The capacity to interact effectively with other people both on a one-to-one basis and in groups, including understanding and responding to the needs of a client and working effectively as a member of a team to achieve a shared goal.

5. Using mathematical ideas and techniques

The capacity to use concepts such as number, space and measurement and techniques such as estimation for practical purposes.

6. Solving problems

The capacity to apply problem solving strategies in purposeful ways, both in situations where the problem and the desired solution are clearly evident and in situations requiring critical thinking and a creative approach to achieve an outcome.

7. Using technology

The capacity to apply technology, combining the physical and sensory skills needed to operate equipment with the understanding of scientific and technological principles needed to explore and adapt systems. (Mayer, 1992)

KEY COMPETENCIES	PERFORMANCE LEVEL 1	PERFORMANCE LEVEL 2	PERFORMANCE LEVEL 3
1. Collecting, analysing and organising ideas and information	Access and record - single source	Access, select and record - more than one source	Access, evaluate and organise - range of sources
2. Communicating ideas and information	Simple - familiar setting	Complex - particular context	Complex - variety of contexts
3. Planning and organising activities	Under supervision	With guidance	Independently initiate and evaluate complex activity
4. Working with others and in teams	Familiar activities	Help formulate and achieve goals	Collaborate in complex activities
5. Using mathematical ideas and techniques	Simple tasks	Select appropriate complex tasks	Evaluate and adapt as appropriate for task
6. Solving problems	Routine - minimal supervision Exploratory - close supervision	Routine – independently Exploratory - with guidance	Complex problems Implement systematic approach; explain processes
7. Using technology	Reproduce or present basic product or service	Construct organise or operate products or services	Design or tailor products or services

TDMMB101B PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

Field B Equipment Checking and Maintenance

DESCRIPTION:

This unit involves the skills and knowledge required to perform routine remedial, preventative and survey deck maintenance on commercial vessels. This includes carrying out basic deck maintenance, cleaning tasks, marine painting and checks on deck machinery and systems.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Perform basic deck maintenance</p>	<ul style="list-style-type: none"> a. Checks of deck surfaces are carried out in accordance with planned maintenance system b. Any deterioration or corrosion of a vessel's deck surfaces is identified and appropriate maintenance action initiated or carried out in accordance with planned maintenance system c. Minor faults and imperfections in painted surfaces are repaired in accordance with procedures d. Weathered surfaces are restored using cleaners and liquid abrasives in accordance with OH&S and pollution control requirements, planned maintenance procedures and manufacturer's instructions e. Tools and equipment are correctly identified and used in accordance with OH&S requirements, company procedures and equipment manufacturer's instructions f. Marine surfaces are prepared for the application of the required marine coating g. Maintenance materials are obtained, handled, prepared and applied in accordance with OH&S and pollution control requirements, company procedures and manufacturer's instructions h. Records of maintenance work carried out are completed in accordance with procedures
<p>2. Carry out cleaning activities</p>	<ul style="list-style-type: none"> a. Appropriate chemicals, cleaning agents and equipment are selected to clean an assigned area of the vessel b. Manufacturer's warning and instructions regarding the use of chemicals and cleaning agents are read, understood and applied c. Cleaning tasks are completed in the assigned area in accordance with procedures and manufacturer's instructions d. Chemicals, cleaning agents and equipment are correctly stored after use
<p>3. Select and apply appropriate paint systems for areas aboard a vessel</p>	<ul style="list-style-type: none"> a. Appropriate paints and painting equipment for a particular surface are selected in accordance with planned maintenance procedures and the paint manufacturer's instructions b. Marine paints are applied using appropriate application equipment in accordance with OH&S requirements, planned maintenance procedures and manufacturer's instructions c. Problems in the application of paints are identified and reported and/or appropriate remedial action initiated d. Debris from maintenance activities is disposed of, or stored, in accordance with established procedures e. Paint and painting equipment are correctly stored after use
<p>4. Check and perform basic maintenance on deck fittings, equipment and systems</p>	<ul style="list-style-type: none"> a. Tools and equipment for basic maintenance are correctly identified and used in accordance with OH&S requirements, planned maintenance procedures and equipment manufacturer's instructions b. Maintenance materials are obtained, handled, prepared and applied in accordance with OH&S and pollution control requirements, company procedures and manufacturer's instructions c. Defective deck fittings, equipment and systems are identified and reported, repaired and/or replaced as required by planned maintenance procedures d. Maintenance equipment is correctly cleaned and stored after use e. Debris and unused materials are disposed of or returned to store in accordance with OH&S and pollution control requirements, planned maintenance procedures and manufacturer's instructions

5. Follow safety and hazard control procedures

- a. Personal protection equipment (PPE) is used in accordance with regulations and OHS policy
- b. Maintenance hazards are identified and action is taken to minimise or eliminate risk to personnel, ship and the environment
- c. Safety, hazard minimisation and pollution control procedures and regulations are followed at all times during maintenance and repair operations
- d. Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel, after authorisation by a responsible officer, are correctly followed

Range Of Variables

PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations and instructions from the relevant master/deck/engineer officer. b. Work is performed within planned maintenance procedures, with responsibility for own outputs in relation to specified quality standards and limited responsibility for others in achieving the specified quality of maintenance outcomes.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian domestic or international commercial vessel b. Maintenance of a vessel may be carried out: <ul style="list-style-type: none"> b.1. while underway b.2. when berthed or moored b.3. when slipped or in dry dock c. Maintenance may include: <ul style="list-style-type: none"> c.1. identification of any deterioration of a deck areas, machinery and fittings c.2. cleaning of areas of the vessel c.3. repairs of minor faults and imperfections in painted surfaces c.4. identification of faulty equipment or fittings and arranging for repair or replacement c.5. restoration of weathered surfaces c.6. preparation of marine surfaces prior to the application of the prescribed marine coating c.7. selection and application of appropriate marine paints for particular surfaces d. Maintenance tools and equipment may include: <ul style="list-style-type: none"> d.1. hand tools including chipping hammers and scrapers d.2. electric power tools such as grinders, sanders and drills, d.3. pneumatic power tools such as grinders, sanders and drills d.4. marine preservative finish application equipment such as brushes, spay guns, rollers d.5. rinsing and storing equipment d.6. personal protection clothing and equipment such as: <ul style="list-style-type: none"> d.6.1. eye and ear protection d.6.2. safety boots d.6.3. dust and fume masks including various cartridges e. Deterioration of vessel's deck areas, machinery and fittings may include: <ul style="list-style-type: none"> e.1. corrosion to deck, fittings and equipment e.2. weathering of surfaces e.3. wearing of fittings and equipment
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. ISM Code safety management system plans, procedures, checklists and instructions a.2. safety management system under NSCV for domestic vessels a.3. IMO STCW Convention and Code a.4. AMSA Marine Orders a.5. planned maintenance system or other preventative maintenance scheme a.6. maintenance records a.7. vessel and equipment manufacturer's instructions, specifications and recommended procedures a.8. instructions, specifications and recommended procedures of manufacturers of maintenance tools and materials
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to the maintenance of vessels a.2. relevant sections of AMSA Marine Orders related to the maintenance of vessels a.3. relevant sections of NSCV/USL Code and guidelines a.4. relevant international, Australian and State/Territory marine, environmental and OH&S legislation

Evidence Guide

PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Perform basic deck maintenance a.2. Carry out cleaning activities a.3. Select and apply appropriate paint systems for areas aboard a vessel a.4. Check and perform basic maintenance on deck fittings, equipment and systems a.5. Exercise all required safety, environmental and hazard control precautions and procedures during planned maintenance operations a.6. Communicate effectively with others when carrying out maintenance procedures onboard a vessel
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of an integrated rating.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant regulations b. ISM Code or the Safety Management System (where required) as it relates to planned vessel maintenance c. Relevant OH&S regulations and policies d. Procedures for the checking the deck areas, machinery and fittings of a vessel as part of planned routine maintenance procedures e. The nature and causes of corrosion of marine surfaces and structures and the available methods for its control f. Corrosion control measures including surface preparation and painting and antifouling g. Paints and painting equipment used in marine maintenance and the related procedures and precautions to be taken for preparation, application and storage h. Safety, environmental and hazard control precautions and procedures relevant to planned maintenance operations i. Procedures for the disposal of debris and waste during planned maintenance activities j. Storage principles of paints, chemicals and cleaning agents used in planned maintenance operations k. Procedures for the correct entry into a confined space onboard a vessel including OHS precautions, testing of unknown atmospheres, use of a confined space entry permit, and procedures as defined in the Safety Management System (where required) or in industry standards and guidelines. l. Principle features of the structure of vessels m. A basic understanding of the properties and application of materials used in vessel construction n. Construction, layout and subdivision requirements of a typical vessel, including an understanding of freeboard and weather deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead o. Maritime communication techniques needed during slipping and maintenance operations p. Problems related to planned maintenance systems for deck areas, machinery and fittings and appropriate action and solutions q. Deck maintenance records that must be maintained on a vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out planned routine maintenance on deck areas, machinery and fittings onboard a vessel, and/or a.2. carry out planned routine maintenance on deck areas, machinery and fittings onboard a commercial or training vessel

Evidence Guide (continued)

PERFORM ROUTINE REMEDIAL, PREVENTATIVE AND SURVEY DECK MAINTENANCE ON A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. performing basic deck maintenance a.2. carrying out cleaning activities a.3. selecting and applying appropriate paint systems for areas aboard a vessel a.4. checking and performing basic maintenance on deck fittings, equipment and systems a.5. applying safety precautions relevant to planned routine maintenance operations <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant regulations b.2. OHS regulations and hazard prevention policies and procedures b.3. Safety Management Systems where required b.4. job procedures and work instructions b.5. relevant vessel manufacturer's guidelines relating to planned routine maintenance procedures b.6. environmental protection procedures when carrying out maintenance operations <p>c. Action is taken promptly to report and/or rectify issues and problems identified during planned routine maintenance</p> <p>d. Work is completed systematically to the required standard</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	2

**TDMMC701B APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING
A SMALL DOMESTIC VESSEL**

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the seamanship skills, knowledge and techniques required when operating a small commercial vessel, including splicing ropes; using ropes and chains; maintaining ropes, wire and chain; rigging gear and loads; operating winches and windlasses; safe handling hawsers and moorings; stowing and securing anchors for sea; securing vessel for rough weather; maintaining watertight integrity; lashing and securing equipment; and towing and being towed.

The unit is consistent with the related functional standards in the NSCV/Australian USL Code (NSCV), dealing with the competency requirements of Coxswain and Master (Class5).

ELEMENT	PERFORMANCE CRITERIA
<p>1. Use and maintain ropes, wire and chains</p>	<p>a. Knots, hitches and bends using fibre and synthetic ropes are correctly made and used in the course of deck operations onboard vessel</p> <p>b. Eye splices and short splices are made in fibre and synthetic rope in accordance with established nautical practice</p> <p>c. Rope, wire and cables are checked and maintained in accordance with company procedures and manufacturer's instructions</p> <p>d. Breaking strain and safe working loads of ropes are determined and applied as load limits in the course of deck operations</p> <p>e. Loads are correctly rigged using appropriate ropes, chains and rigging gear in accordance with regulations</p> <p>f. Rigging gear is checked prior to use and/or going to sea and faulty gear reported and replaced or repaired</p> <p>g. Maximum load limits are determined and applied when lifting equipment and loads using ropes, chains and rigging</p> <p>h. Lines are made up in preparation for berthing of vessel</p> <p>i. Lines are handled as directed to assist in berthing and unberthing a vessel</p> <p>j. A warping drum is used to heave in surge and veer lines</p> <p>k. Berthing lines are turned up and secured to bits, staghorns and cleats as required</p> <p>l. Moorings and hawsers are safely handled in accordance with established nautical practice</p>
<p>2. Operate winches and windlasses</p>	<p>a. Winches, capstans and windlasses (as appropriate) are checked and prepared for operation prior to use</p> <p>b. Winches, capstans and windlasses (as appropriate) are safely operated to carry out deck operations in accordance with operational requirements and manufacturer's instructions</p>
<p>3. Tow and be towed</p>	<p>a. Preparations for towing are safely made in accordance with established nautical practice</p> <p>b. Correct towing procedures and precautions are applied when towing and being towed</p>

<p>4. Secure a small vessel for sea</p>	<ul style="list-style-type: none"> a. Anchors cables and deck fittings are correctly identified and selected for use when required b. Accommodation spaces and personnel facilities onboard the vessel are checked for cleanliness, hygiene and tidiness and correctly secured for sea in accordance with established procedures and tourism or operational standards c. Equipment and items on deck and in equipment and galley spaces are secured in accordance with regulatory requirements d. Watertight integrity of vessel is checked and appropriate action is taken to prepare for prevailing and forecast weather and sea conditions e. Anchor tasks are carried out in accordance with established nautical practice f. Vessel is prepared and anchored in varying weather conditions g. Anchor is weighed and vessel proceed in those same conditions
<p>5. Identify and explain the structural components and material of a small vessel</p>	<ul style="list-style-type: none"> a. Basic structural components are correctly identified b. Reasons for deteriorated hull and fittings are identified and explained c. Basic understanding of the properties and application of common materials used in small vessel construction is demonstrated and applied when operating a small vessel
<p>6. Apply seamanship skills and techniques</p>	<ul style="list-style-type: none"> a. Rope types and common areas of use are correctly identified b. Reef knots, bowlines, sheet bends, clove hitches, round turns and two half hitches are correctly identified, explained and demonstrated c. Procedures for eye splicing a fibre/synthetic rope end and joining two rope ends are demonstrated in accordance with the rope manufacturer's recommendations d. Common whippings are demonstrated e. A sea anchor is rigged to control a specified rate and direction of drift and or angle to sea and also for emergency steering and to prevent broaching

Range Of Variables

APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING A SMALL DOMESTIC VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations b. Work is performed within defined operational procedures, with responsibility for own outputs and limited responsibility for others in achieving the specified quality of small vessel operations. It involves the organisation and conduct of a range of specified deck operations for a small commercial vessel
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include small commercial vessels engaged on coastal voyages b. Deck operations may be carried out: <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while towing and being towed c. Deck operations on a small vessel will depend on the limits of responsibility of the person concerned and may include: <ul style="list-style-type: none"> c.1. using and maintaining ropes, wires and chains c.2. splicing natural fibre and synthetic ropes c.3. cleanliness, hygiene and tidiness of accommodation and facilities c.4. checking the watertight integrity of the vessel c.5. checking the securing deck, engineering and accommodation spaces prior to going to sea c.6. assisting in anchor work c.7. work mooring lines and assist in the mooring of the vessel c.8. checking and operating winches, capstans and windlasses c.9. checking and using ropes, chains and rigging gear when lifting loads including the determination of safe working loads c.10. towing arrangements c.11. anchoring methods (listed separately below) c.12. use of sea anchors d. Anchor work of a small vessel will depend on the limits of responsibility of the person concerned and may include: <ul style="list-style-type: none"> d.1. clearing away an anchor ready for letting go d.2. letting go an anchor and laying out cable d.3. weighing anchor d.4. securing an anchor for sea d.5. assessing when a vessel has its cable and is riding to the anchor d.6. assessing when an anchor is 'aweight' d.7. operating the forecastle winch, windlass and/or capstan as required for anchor work
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. relevant regulations a.2. ship's operational plan a.3. vessel manufacturer's instructions and recommended procedures a.4. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. relevant sections of NSCV/Australian USL Code related to the operation of a small vessel a.2. relevant Australian and State/Territory OH&S legislation

Evidence Guide

APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING A SMALL DOMESTIC VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <p>a.1. Organise and carry out deck operations in accordance with established standards of good seamanship</p> <p>a.2. Exercise all required safety and hazard control procedures when manoeuvring the ship</p> <p>a.3. Communicate effectively with others during deck and vessel operations</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master or a coxswain on a small commercial vessel</p>
<p>3. Required knowledge and skills</p>	<p>a. Knowledge of relevant maritime regulations</p> <p>b. Relevant OH&S legislation and policies as they relate to small vessel deck operations</p> <p>c. Parts of a small vessel and the materials, fittings and equipment used in a small vessel.</p> <p>d. Names of lines used from various parts of a vessel and the various ways a vessel is made fast to a wharf</p> <p>e. Procedures for berthing and unberthing a small vessel</p> <p>f. Types of anchors, cables and associated deck fittings in common use on small vessels and their purpose</p> <p>g. Procedures involved in anchor work on a small vessel</p> <p>h. Procedures for checking and operating winches, windlasses and capstans during vessel operations</p> <p>i. Methods of making appropriate reports by visual and verbal means to others onboard during vessel operations</p> <p>j. Types of knots, bends and hitches in common use, their applications and limitations, and methods of tying them using synthetic and fibre rope of varying construction and size</p> <p>k. Procedures for splicing synthetic and fibre rope</p> <p>l. Factors involved in rope deterioration and maintenance requirements for different types of rope</p> <p>m. Procedures for checking the watertight integrity of a small vessel</p> <p>n. Methods of securing a vessel before it puts to sea</p> <p>o. Procedures for stowing galley appliances, food utensils, containers and supplies for sea</p> <p>p. Procedures for checking and securing personnel accommodation and facilities prior to putting to sea</p> <p>q. Maritime communication techniques</p> <p>r. Procedures for the checking and inspecting a vessel's seaworthiness</p> <p>s. Corrosion control measures including surface preparation and painting and antifouling</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <p>a.1. a suitable range of appropriately-simulated operational situations for a small commercial vessel; and/or</p> <p>a.2. carry out deck operations on a small vessel</p>

Evidence Guide (continued)

APPLY SEAMANSHIP SKILLS AND TECHNIQUES WHEN OPERATING A SMALL DOMESTIC VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning seamanship knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. carrying out deck operations, anchor work and securing a vessel for sea a.2. towing and being towed a.3. applying safety precautions relevant to deck operations a.4. assessing watertight integrity of the vessel and the security of vessel's equipment and spaces <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. OHS regulations and hazard prevention policies and procedures b.3. job procedures and work instructions b.4. relevant manufacturer's guidelines relating to the use of ropes, wires, cables, anchors, deck equipment and machinery, including instructions on equipment capability and limitations b.5. on-board housekeeping processes <p>c. Action is taken promptly to report accidents, safety incidents and operational problems</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	1

TDMMC901B MANOEUVRE A DOMESTIC VESSEL OF LESS THAN
12 METRES IN LENGTH OPERATING WITHIN INSHORE LIMITS

Field C Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to manoeuvre a commercial vessel of less than 12 metres in length within inshore limits, including berthing, mooring and anchoring operations and manoeuvring during emergencies and exceptional circumstances.

The unit is consistent with the relevant sections of the NSCV/Australian USL Code dealing with the competency requirements of a Coxswain.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Manoeuvre the vessel for required operations in normal conditions</p>	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operation and keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, weather, tide, headreach and stopping distances c. Alterations of heading or power are smooth and controlled at all times d. Communication is clear, concise and acknowledged at all times according to good seamanship e. Suitable mode of steering is selected for the manoeuvre with respect to the area, wind, tide and sea conditions f. Vessel propulsion units are controlled as required to progress the operation and complement steering movements g. Safe operating limits of vessel propulsion, steering and power systems are not exceeded h. Adequate resources are organised prior to and during operations i. Communication during manoeuvres is clear, concise and acknowledged at all times
<p>2. Manoeuvre the vessel during exceptional circumstances and emergencies</p>	<ul style="list-style-type: none"> a. Manoeuvres are made to safely progress the operations during the emergency or exceptional circumstance and to keep the vessel in safe water b. Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre, the nature of the emergency or exceptional circumstance and the existing sea, tide and weather conditions c. Risks to the vessel and the safety of persons on board are assessed during manoeuvres and appropriate risk minimisation strategies are developed and applied d. Alterations of heading or power are smooth and controlled at all times and are appropriate to the emergency or exceptional situation e. Action is taken in the event of collision, grounding or other marine casualty to secure the vessel and maintain the safety of the vessel and those on-board and of any other vessels and persons involved f. Communication during the emergency is clear, concise and acknowledged at all times

Range Of Variables

MANOEUVRE A DOMESTIC VESSEL OF LESS THAN 12 METRES IN LENGTH OPERATING WITHIN INSHORE LIMITS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the NSCV/Australian Uniform Shipping Laws Code dealing with vessels of less than 12 metres b. Work is performed to defined procedures/methods either individually or in a team environment. It involves the use of some discretion and judgement in the application of fundamental nautical principles and known manoeuvring techniques across a variety of operational contexts for vessels of less than 12 metres operating within inshore limits
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel of less than 12 metres in length operating within inshore limits b. Propulsion units may be in-board or out-board and may include single or twin propeller systems c. Manoeuvres may be carried out: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any possible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring c.6. when beaching and refloating a vessel c.7. while crossing coastal bars d. Manoeuvres may include: <ul style="list-style-type: none"> d.1. berthing and unberthing d.2. berthing in a pen d.3. mooring or anchoring d.4. handling vessel in shallow water, rivers, estuaries and restricted waters d.5. steering astern through an "s" configuration d.6. use of in-board or out-board propulsion systems d.7. towing and being towed d.8. turning a vessel across the tide across the wind d.9. dragging an anchor and clearing a foul anchor e. Manoeuvres will occur within in-shore limits including: <ul style="list-style-type: none"> e.1. at sea e.2. in tidal streams e.3. in confined waters e.4. in proximity to other vessels that are berthed, at anchor, underway but stopped, or underway and making way, particularly large vessels f. Emergencies may include: <ul style="list-style-type: none"> f.1. loss of rudder or propeller f.2. man overboard f.3. collision f.4. grounding f.5. cyclones or severe weather or when hove to f.6. fire or flooding on board vessel. g. Special handling techniques required in adverse weather may include: <ul style="list-style-type: none"> g.1. manoeuvring in the face of strong winds, high sea state, heavy swell and surf g.2. keeping an unmanageable vessel out of the trough of the sea g.3. lessening drift g.4. assisting a vessel in distress g.5. towing operations g.6. launching rescue boats and survival craft g.7. taking on board survivors from rescue boats and survival craft
3. Sources of information/documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. operational instructions a.2. navigational charts a.3. relevant maritime regulations a.4. vessel's log a.5. vessel manufacturer's instructions and recommended procedures a.6. instructions of relevant Maritime Authorities a.7. occupational health and safety instructions and regulations

Range Of Variables (continued)

MANOEUVRE A DOMESTIC VESSEL OF LESS THAN 12 METRES IN LENGTH OPERATING WITHIN INSHORE LIMITS

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable regulations and legislation may include: a.1. sections of the NSCV/Australian USL Code applicable to vessels of less than 12 metres operating within offshore limits a.2. International Regulations for Preventing Collisions at Sea a.3. relevant Australian and State/Territory occupational health and safety legislation

Evidence Guide

MANOEUVRE A DOMESTIC VESSEL OF LESS THAN 12 METRES IN LENGTH OPERATING WITHIN INSHORE LIMITS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <p>a.1. Manoeuvre a vessel of less than 12 metres in length within in-shore limits:</p> <ul style="list-style-type: none"> a.1.1. in normal and emergency situations and adverse weather conditions a.1.2. when underway a.1.3. when anchoring or mooring a.1.4. during berthing and unberthing operations a.1.5. while anchoring or mooring a.1.6. when beaching and refloating a vessel a.1.7. while crossing coastal bars <p>a.2. Exercise all required safety and hazard control procedures when manoeuvring a vessel of less than 12 metres in length within in-shore limits</p> <p>a.3. Identify manoeuvring problems and take appropriate action</p> <p>a.4. Communicate effectively with others during manoeuvring operations</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of the coxswain of a vessel of less than 12 metres in length operating within offshore limits.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Manoeuvring and propulsion characteristics for vessels of less than 12 metres in length operating, including stopping distances and turning circles at various draughts, speeds and loading c. Effects of displacement and planing hulls on manoeuvring characteristics of small power driven vessels d. Principles of stability and trim in a small vessel and the disposition of passengers and/or cargo required to maintain stability and trim within safe limits e. Manoeuvring problems for vessels of less than 12 metres in and appropriate action and solutions f. Methods for controlling vessel speed and direction g. Effects on manoeuvres of wind, currents and bottom topography h. Characteristics of entrance bars and knowledge of manoeuvres for crossing those bars i. Principles for avoiding or evading being caught in cyclones and severe weather j. Characteristics of adverse weather and sea conditions and the related precautions and manoeuvring techniques that should be applied to maintain the control and stability of the vessel k. Requirements of the International Regulations for Preventing Collisions at Sea and other regulations set by local authorities l. Maritime communication techniques m. Relevant OH&S legislation and policies
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. manoeuvre a working or training vessel of less than 12 metres in length in an appropriate range of normal and real or simulated emergency in-shore situations including normal and adverse weather conditions; and/or a.2. operate a suitably-realistic small vessel simulator over an appropriate range of simulated manoeuvring situations and weather conditions

Evidence Guide (continued)

MANOEUVRE A DOMESTIC VESSEL OF LESS THAN 12 METRES IN LENGTH OPERATING WITHIN INSHORE LIMITS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 completing defined manoeuvring operations a.2 identifying and evaluating manoeuvring problems and determining an appropriate courses of action a.3 applying safety precautions relevant to manoeuvring operations a.4 assessing operational capability of vessel and propulsion plant and equipment <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 manufacturer's guidelines relating to the use of propulsion and other on-board equipment, including information on capability and limitations <p>c. Action taken promptly to report accidents and navigational incidents</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	2	2

TDMMC1001B STEER A DOMESTIC VESSEL UNDER THE DIRECTION OF THE MASTER OR OFFICER IN CHARGE OF THE WATCH

Field MC Manoeuvring Vessel

DESCRIPTION:

This unit involves the skills and knowledge required to steer a commercial vessel under the direction of the Master or Officer in Charge of the Watch on a steady course within acceptable limits having regard to the area of navigation and prevailing sea state. This also includes making smooth and controlled alterations of course when required, maintaining clear and concise communications at all times and acknowledging orders in a seamanlike manner.

The unit is consistent with the related functional standards in Section A III/4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4, and the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Steer the vessel	<ul style="list-style-type: none"> a. Vessel is steered under the direction of the Officer in Charge of the Watch in response to helm orders and set course b. Vessel's heading is maintained within acceptable limits with respect to the directions of the Officer in Charge of the Watch, given helm orders, the area of navigation, weather and sea condition and tide c. Vessel's steady course is maintained for ten minutes within 2 degrees d. Alterations of heading are smooth and controlled at all times e. Communication is clear, concise and acknowledged at all times according to good seamanship f. Steering is changed from automatic pilot to manual steering and vice versa in accordance with to the directions of the Officer in Charge of the Watch, helm orders, vessel's procedures and manufacturer's instructions g. Safe operating limits of vessel's steering systems are not exceeded h. Steering techniques are consistent with the prevailing weather and sea conditions or possible states of emergency
2. Respond to orders	<ul style="list-style-type: none"> a. The directions of the Officer in Charge of the Watch and helm orders are correctly understood, acknowledged and promptly acted upon b. Confirmation or clarification of directions and helm orders is sought where they are not clearly understood

Range Of Variables

STEER A DOMESTIC VESSEL UNDER THE DIRECTION OF THE MASTER OR OFFICER IN CHARGE OF THE WATCH

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the AMSA Marine Orders and IMO STCW Conventions and Codes and domestic regulations, codes and standards b. Work is performed under the directions of the Officer in Charge of the Watch using a prescribed range of procedures/methods either individually or in a team environment with some accountability for the quality of outcomes c. In small domestic vessels, the Master may provide the supervision in lieu of the Officer in Charge of the Watch and a deckhand may carry out the role of an Integrated Rating or Rating d. Work involves the use of known and defined steering techniques across a variety of navigational contexts in response to the directions of the Officer in Charge of the Watch
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Steering may include hand steering or automatic pilot c. Steering of the vessel may be carried out: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any possible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring c.6. when navigating in and near 'traffic separation schemes' and 'vessel traffic service areas' c.7. in shallow water, rivers, estuaries and restricted waters c.8. when towing and being towed c.9. when dragging an anchor and clearing a foul anchor d. Helm orders will be given in the English language and require sufficient proficiency in speaking and understanding in English to communicate effectively with the Master or Officer in Charge of the Watch and others on the bridge of the vessel. e. Emergencies may include: <ul style="list-style-type: none"> e.1. man overboard e.2. collision e.3. grounding e.4. when hove to e.5. fire or flooding on board vessel. f. Special steering techniques required in adverse weather may include: <ul style="list-style-type: none"> f.1. steering in the face of strong winds, high sea state, heavy swell and surf f.2. steering an unmanageable vessel out of the trough of the sea in response to helm orders f.3. steering to assist a vessel in distress f.4. steering during towing operations f.5. steering during the launching of rescue boats and survival craft f.6. steering when taking on board survivors from rescue boats and survival craft
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. safety management system plans, procedures, checklists and instructions a.1. helm orders a.2. company and vessel procedures a.3. vessel manufacturer's instructions and recommended procedures a.4. instructions of relevant Maritime Authorities a.5. occupational health and safety instructions and regulations
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to steering and navigation of vessels a.2. relevant sections of AMSA Marine Orders a.3. relevant sections of NSCV/USL Code and guidelines a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

STEER A DOMESTIC VESSEL UNDER THE DIRECTION OF THE MASTER OR OFFICER IN CHARGE OF THE WATCH

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <p>a.1. Steer a vessel under the directions of the Officer in Charge of the Watch and in response to helm orders:</p> <ul style="list-style-type: none"> a.1.1. in normal and emergency situations and adverse weather conditions a.1.2. when underway a.1.3. when anchoring or mooring a.1.4. during berthing and unberthing operations a.1.5. while anchoring or mooring a.1.6. during emergencies <p>a.2. Exercise all required safety and hazard control procedures when steering a vessel</p> <p>a.3. Identify typical steering problems and take appropriate action</p> <p>a.4. Communicate effectively with others in the bridge team when steering a vessel</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<p>a. Knowledge of relevant sections of IMO STCW Convention and Codes, AMSA Marine Orders and the NSCV/USL Code applicable to the steering of vessels</p> <p>b. Relevant State & Territory marine and OH&S legislation, standards, codes of practice, guidelines policies and procedures</p> <p>c. Limits of responsibility of a rating on a vessel carrying out steering duties</p> <p>d. Principles and procedures for steering a vessel</p> <p>e. Typical helm orders and steering action required</p> <p>f. Procedures for changing over from automatic pilot to hand steering and vice versa</p> <p>g. Effects on steering of wind, currents and bottom topography</p> <p>h. Steering problems for various sizes of vessels and appropriate action and solutions</p> <p>i. Steering techniques in and near 'traffic separation schemes' and 'vessel traffic service areas'</p> <p>j. Ability to communicate effectively in the English language with the Officer in Charge of the Watch and others in the bridge team</p> <p>k. Maritime communication techniques, including responding to helm orders</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <p>a.1. steer a vessel simulator, meeting the requirements of Section A I/12 of the IMO STCW Code, over an appropriate range of simulated manoeuvring situations, weather and loading conditions; and/or</p> <p>a.2. steer a working or training vessel under the direction of the Officer in Charge of the Watch over an appropriate range of situations, weather and loading conditions</p>

Evidence Guide (continued)

STEER A DOMESTIC VESSEL UNDER THE DIRECTION OF THE MASTER OR OFFICER IN CHARGE OF THE WATCH

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 steering the vessel under the direction of the Officer in Charge of the Watch a.2 identifying and steering problems and determining appropriate courses of action a.3 applying safety precautions relevant to steering of a vessel a.4 assessing operational capability of steering system and equipment b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 relevant sections of IMO STCW Convention and Code, AMSA Marine Orders and the NSCV/USL Code applicable to the steering of vessels b.2 Ship's Safety Management System and procedures b.3 marine and OH&S regulations and hazard prevention policies and procedures b.4 job procedures and work instructions b.5 relevant manufacturer's guidelines relating to the use of steering equipment, including information on capability and limitations b.6 bridge housekeeping procedures c. Action is taken promptly to report and/or rectify steering incidents in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDMME801B TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT ON A VESSEL

Field E Communication

DESCRIPTION:

This unit involves the skills and knowledge required to transmit and receive information by GMDSS sub-systems and equipment on board a commercial vessel, including using the equipment for search and rescue radio-communications, preventing false distress alerts, mitigating the effects of false distress alerts, implementing preventative safety measures in relation to radio equipment hazards, and providing radio services during emergencies such as abandonment of vessel, fire onboard vessel, and breakdown of radio installations.

The unit is consistent with the Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service, 1987, the AMSA Marine Orders Part 6, and the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Operate GMDSS sub-systems and equipment to transmit and receive messages</p>	<p>a. Types of GMDSS communication equipment are selected and operated within limits of specifications</p> <p>b. GMDSS communication equipment is operated to transmit and receive various types of signal in accordance with manufacturer's instructions, established GMDSS procedures and regulatory requirements</p> <p>c. GMDSS procedures appropriate for the sea area concerned are correctly applied in accordance with regulatory requirements</p> <p>d. Regulations and procedures applicable to vessel stations equipped with GMDSS communications equipment and digital selective calling (DSC) facilities are applied during radio communications</p> <p>e. OHS procedures and hazard control strategies are applied when operating radio equipment in accordance with vessel's ISM Code safety management system</p>
<p>2. Maintain and fault-find radio equipment</p>	<p>a. Routine maintenance checks are carried out on GMDSS equipment in accordance with manufacturer's instructions and specifications and company procedures</p> <p>b. Out-of-specification performance and faults in GMDSS equipment are correctly identified and investigated using prescribed fault-finding techniques in accordance with established user maintenance procedures and manufacturer's instructions</p> <p>c. Identified faults and defective GMDSS equipment and component parts are rectified or replaced in accordance with manufacturer's instructions and established maintenance procedures</p>
<p>3. Provide radio services during emergencies</p>	<p>a. Radio procedures as defined in the international and national radio regulations and SOLAS Convention are applied during emergency situations and search and rescue operations</p>

Range Of Variables

TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT ON A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of the Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service (1987), and maritime regulations. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of principles of marine radiotelephony to accurately transmit and receive messages using the GMDSS system. Use of correct procedures for transmitting and receiving of signals using GMDSS equipment appropriate for the sea area concerned, as well as deployment and operation of satellite EPIRBs and SARTs is required. Limited accountability and responsibility for self and others in achieving the outcomes is involved. d. Work requires the accurate and consistent use and user maintenance of the GMDSS system to send and receive messages and signals under normal and emergency situations in accordance with international and national radio regulations.
2. Worksite environment	<ul style="list-style-type: none"> a. Communications may be carried out in both normal and emergency situations using shipboard GMDSS equipment appropriate for the sea area concerned, Emergency Position Indicating Radio Beacons (EPIRBs) and SARTs b. Communications using the GMDSS system may be carried out: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather b.3. while underway b.4. while anchored or moored c. Radio equipment may include: <ul style="list-style-type: none"> c.1. radiotelephony transceiving equipment, including: <ul style="list-style-type: none"> c.1.1. medium frequency / high frequency equipment (MF/HF) c.1.2. very high frequency equipment (VHF) c.2. digital selective calling (DSC) equipment c.3. ECG receiver c.4. Navtext receiver c.5. Emergency Position Indicating Radio Beacon (EPIRB) c.6. Search and Rescue Transmitter (SART) c.7. batteries c.8. antennas c.9. electrical and radio cable connections c.10. electrical fuses d. Radio communication procedures may include: <ul style="list-style-type: none"> d.1. calling a coast station by radiotelephone d.2. ordering a manually switched call d.3. terminating a call d.4. special facilities available, including methods of calling a coast station by DSC selecting an automatic radiotelephone call e. Radio communications may include: <ul style="list-style-type: none"> e.1. normal vessel-to-vessel service e.2. normal vessel-to-shore service e.3. port operations service e.4. vessel movement service e.5. distress e.6. urgency e.7. safety e.8. navigational e.9. medical advice e.10. on-board communications e.11. emergency position signals

Range Of Variables (continued)

TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT ON A VESSEL

<p>2. Worksite environment (continued)</p>	<p>f. Organisations with whom radio communications may be conducted may include:</p> <ul style="list-style-type: none"> f.1. coast stations f.2. limited coast stations f.3. private shore stations f.4. pilot and port stations f.5. aircraft stations Rescue Coordination Centres f.6. volunteer coast guard stations. f.7. search and rescue coordination centre location and operator f.8. state police forces f.9. company bases f.10. fishing organisations and cooperatives <p>g. Available radio services may include:</p> <ul style="list-style-type: none"> g.1. medical advice services g.2. search and rescue g.3. AUSREP g.4. Inmarsat services (A, B, C, M and E) g.5. public correspondence <p>h. EPIRB frequencies may include:</p> <ul style="list-style-type: none"> h.1. 406 MHz h.2. 121.5 / 243 MHz
<p>3. Sources of information/ documents</p>	<p>a. Sources of information and documentation may include:</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code concerning radio communications a.2. sections of AMSA Marine Orders and USL Code concerning radio communications a.3. SOLAS Convention a.4. radiotelephony regulations a.5. radio communications log a.6. radio equipment manufacturer's specifications and instructions a.7. records of radio communications
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable regulations and legislation may include:</p> <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention related to marine radio communications a.2. relevant sections of AMSA Marine Orders related to marine radio communications a.3. Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Service (1987) a.4. SOLAS Convention a.5. Australian radio communications legislation including: a.6. Australian Communications Authority Act a.7. Radiocommunications Act (1992) a.8. Telecommunications Act a.9. Telecommunications (Transitional Provisions and Consequential Amendments) Act

Evidence Guide

TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT ON A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Operate GMDSS sub systems and equipment to transmit and receive messages a.2. Maintain and fault-find GMDSS radio equipment a.3. Access search and rescue radio facilities a.4. Deploy and operate an EPIRB and a SART a.5. Maintain records of radio communications
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other units that form part of a job role of a person with a responsibility for radio communications onboard a commercial vessel using the GMDSS System.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of maritime regulations related to marine radio communications b. International and national radio regulations applicable to mobile marine communications c. Principles of radio propagation, including: <ul style="list-style-type: none"> c.1. basic propagation mechanisms at LF, MF, HF and VHF c.2. Maximum Useable Frequency (MUF) c.3. Optimum Working Frequency (OWF) c.4. frequency bands c.5. classes of emission c.6. duplex, simplex paired frequencies and ITU channels d. Different types of marine radio equipment, their features, applications, operating characteristics and operating procedures e. Prohibitions of connecting non-GMDSS equipment f. Types, applications and features of basic antenna systems used in marine radio communications g. Basic principles and procedures for marine radio communications, including: <ul style="list-style-type: none"> g.1. correct use of frequencies, frequency bands and modes of emission g.2. frequencies for routine call and reply g.3. distress, urgency and safety communications g.4. definition of coverage and sea areas for Digital Selective Calling (DSC) g.5. radio calling, replying and relaying procedures g.6. purpose of silence periods when operating radio equipment g.7. limitations on the performance of different types of marine radio equipment g.8. purpose for and procedures for the monitoring of calling and working frequencies g.9. methods of communicating vessel position h. Procedures for using various GMDSS systems and services, including: <ul style="list-style-type: none"> h.1. Inmarsat services (A, B, C, M and E) h.2. Enhanced Group Calling System (EGC) h.3. DSC facilities and usage h.4. EGC receiver h.5. MSI services h.6. NAVTEXT system h.7. SafetyNET system i. Procedures for deploying and operating survival craft radio equipment including: EPIRBs and SARTs j. The principles and procedures of the Search and Rescue (SAR) system, including: <ul style="list-style-type: none"> j.1. the role of the Rescue Coordination Centre j.2. the role of a SAR unit j.3. the use and operation of vessel reporting systems including AUSREP and AMVER k. Maintenance strategies and requirements for GMDSS equipment as defined in SOLAS and Radio Regulations l. Operational checks including: <ul style="list-style-type: none"> l.1. checking of radio performance (using built in test facilities) l.2. testing fuses l.3. measuring capacity of batteries and the specific gravity of the electrolyte l.4. measuring on and off load voltage. m. Radio equipment faults and defects and related fault finding techniques and remedial procedures

Evidence Guide (continued)

TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT ON A VESSEL

<p>3. Required knowledge and skills (continued)</p>	<p>n. Hazards associated with radio transmission and the repair and maintenance of radio equipment and related hazard control measures and OHS regulations.</p> <p>o. A basic understanding of the Australian marine search and rescue system</p> <p>p. Procedures for the transmitting and decoding of the phonetic alphabet excluding the figure code</p> <p>q. Radio communications problems and appropriate action and solutions</p> <p>r. Procedures for keeping records of radio communications</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <p>a.1. demonstrate performance in suitably-simulated radio communications activities using the GMDSS System covering a range of normal, emergency and search and rescue radio communication situations that may be typically experienced on a vessel; and/or</p> <p>a.2. use GMDSS radio communications equipment in an appropriate range of operational situations on board an operational commercial or training vessel</p>
<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <p>a.1. operating GMDSS sub-systems and equipment to transmit and receive messages</p> <p>a.2. maintaining and fault-finding GMDSS equipment</p> <p>a.3. accessing search and rescue radio facilities</p> <p>a.4. deploying and operating an EPIRB and a SART</p> <p>a.5. identifying and evaluating radio communication problems and determining appropriate courses of action</p> <p>a.6. maintaining records of radio communications</p> <p>b. Shows evidence of application of relevant workplace procedures including:</p> <p>b.1. relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders</p> <p>b.2. OHS procedures and legislation</p> <p>b.3. job procedures and work instructions</p> <p>b.4. guidelines relating to the use of a GMDSS communications sub-systems and equipment on-board the vessel</p> <p>c. Action is taken promptly to report radio communications problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <p>b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations</p> <p>b.2. Appropriate practical assessment must occur:</p> <p>b.2.1. at the registered training organisation, and/or</p> <p>b.2.2. on an appropriate working or training vessel</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	2	2	2	1	2	3

**TDMMF501B DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND
HANDLE EMERGENCY SITUATIONS ON BOARD A VESSEL**

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to contribute to the development emergency and damage control plans and handling of emergency situations on board a commercial vessel, including the preparation of contingency plans for response to emergencies, plans for damage control, procedures and aids for fire prevention, detection and extinction and the establishment and implementation of life-saving procedures including the use of various life-saving appliances.

The unit is consistent with the related functional standard in Tables A II/2 and A III/2 of the STCW Code and Appendices 2 and 3 of Part 3, Issue 5 of the AMSA Marine Orders AMSA Marine Orders Part 3, Issue 5, Appendices 2 and 3, and the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Prepare contingency plans for emergency response</p>	<ul style="list-style-type: none"> a. Potential emergency situations are identified in conjunction with relevant shipboard personnel b. Plans of action are developed by the master and chief engineer with appropriate assistance from other personnel detailing procedures for responding to potential emergency situations in accordance with regulatory requirements and company procedures c. Resources are organised in readiness for potential implementation of contingency plans d. Contingency plans for dealing with emergency response are documented in accordance with company procedures and regulatory requirements e. Shipboard officers and crew are made aware of contingency plans for emergency response f. Drills are carried out at appropriate times to test the readiness of shipboard personnel to implement emergency contingency plans
<p>2. Develop plans for damage control following a shipboard emergency</p>	<ul style="list-style-type: none"> a. Possible damage scenarios are identified and appropriate methods of damage control are devised by the vessel's management team in accordance with established marine practice b. Plans of action for dealing with shipboard damage, particularly that involving the integrity of the vessel's hull, are developed by the vessel's management team in accordance with regulatory requirements and company procedures c. Planned damage control procedures for dealing with damage to the vessel and its hull are documented in accordance with company procedures and regulatory requirements d. Appropriate resources are organised in readiness for possible deployment should there be damage to the vessel during an emergency
<p>3. Develop plans for fire protection, detection and extinction</p>	<ul style="list-style-type: none"> a. Plans of action for fire protection, detection and extinction are developed by the vessel's management team in accordance with regulatory requirements, marine fire control practice and company procedures b. Plans for fire protection, detection and extinction are documented in accordance with company procedures and regulatory requirements c. Appropriate resources are organised in readiness for possible deployment should there be a fire on board the vessel during an emergency d. Fire control drills are carried out at appropriate times to test the readiness of shipboard personnel to implement plans for fire protection, detection and extinction

<p>4. Develop procedures for the use of various life-saving appliances</p>	<p>a. Procedures for the use of various shipboard life-saving appliances are developed by the vessel's management team in accordance with regulatory requirements, manufacturer's instructions and company procedures</p> <p>b. Procedures for the use of various life-saving appliances are documented in accordance with company procedures and regulatory requirements</p> <p>c. Instruction is organised for shipboard personnel in the correct use of life-saving appliances</p> <p>d. Life saving drills are carried out at appropriate times to test the readiness of shipboard personnel to correctly carry out life-saving procedures and use life-saving appliances</p>
<p>5. Coordinate the implementation of emergency response plans</p>	<p>a. Information on emergency response plans is distributed and made available to shipboard personnel via noticeboards, pamphlets and documented instructions</p> <p>b. Appropriate instruction is organised for shipboard personnel in their roles and responsibilities during various types of shipboard emergencies</p> <p>c. Appropriate emergency drills are carried out at appropriate times to test the readiness of shipboard personnel to correctly carry out various emergency response plans</p> <p>d. Appropriate alarms and directions are given when a shipboard emergency is detected</p> <p>e. Action in dealing with an emergency is coordinated in accordance with the emergency response plan, regulatory requirements and company procedures</p> <p>f. Details of a shipboard emergency and the action taken is documented in accordance with regulatory requirements and company procedures</p>
<p>6. Implement safety precautions before entering tanks or confined spaces</p>	<p>a. Maintenance activities are planned and carried out in accordance with technical legislative, safety, and procedural specification</p> <p>b. Precautions before entering tanks or confined spaces are understood, applied and demonstrated</p>

Range Of Variables

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS ON BOARD A DOMESTIC VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations, conventions and codes. b. Work is performed relatively independently under broad operational requirements, with accountability and responsibility for self and others in planning for and coordinating shipboard emergencies. c. Work involves the application of a significant range of fundamental marine emergency principles, practices and procedures across a wide and often unpredictable variety of shipboard emergencies. Contribution to the development of shipboard emergency response plans is required. Accountability and responsibility for self and others in preparing for the possible implementation of emergency plans is involved. d. The Master has ultimate responsibility within the vessel's management team for the development and implementation of emergency control plans and responses. The Chief Engineer is responsible for the management, development and implementation of the machinery space emergency control plans. e. Work requires significant judgement in planning, technical and leadership functions related to the development and coordination of emergency procedures onboard vessels.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Plans for emergency response may include: <ul style="list-style-type: none"> b.1. defining the roles and responsibilities of shipboard personnel during the emergency b.2. establishment of a chain of command b.3. details of the sequence of action to be taken during the type(s) of emergency concerned b.4. damage assessment procedures b.5. damage control measures b.6. resources deployment procedures including use of day-to-day items b.7. communications strategy b.8. life saving procedures b.9. abandon vessel procedures where required b.10. rescue of personnel from confined spaces c. Potential emergencies may occur: <ul style="list-style-type: none"> c.1. by day or night c.2. under any possible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring d. Emergencies may include: <ul style="list-style-type: none"> d.1. collision with another vessel d.2. explosion on board a vessel d.3. fire on board a vessel d.4. impairment of integrity of hull d.5. loss of steering control d.6. loss of motive power d.7. grounding d.8. beaching a vessel d.9. person overboard d.10. rescue and evacuation (including from confined spaces) of injured personnel e. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> e.1. use of softwood wedges and plugs to reduce water ingress e.2. erection and application of vertical shoring e.3. construction and fitting of a leak-stopping mat e.4. temporary repair of a ruptured pressurised pipe e.5. operation of a portable salvage pump f. Damage control measures in a fire or explosion emergency may include: <ul style="list-style-type: none"> f.1. use of appropriate fire fighting equipment and techniques such as various types of fire extinguishers, fire blankets, fire hoses and nozzles, and foam applicators f.2. activation of fixed fire fighting sprinklers and systems f.3. fire extinction methodologies f.4. boundary cooling techniques

Range Of Variables (continued)

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS ON BOARD A DOMESTIC VESSEL

VARIABLE	SCOPE
2. Worksite environment (continued)	<ul style="list-style-type: none"> g. Survival & lifesaving equipment may include: <ul style="list-style-type: none"> g.1. fire fighting outfits and associated equipment g.2. life jackets g.3. exposure suits g.4. immersion suits g.5. survival craft g.6. radio devices including EPIRBs
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. safety management system plans, procedures, checklists and instructions a.2. operational orders a.3. navigational charts a.4. IMO Conventions and Codes a.5. AMSA Marine Orders a.6. NSCV/USL Code a.7. vessel's log a.8. company emergency procedures a.9. vessel manufacturer's instructions and recommended procedures for damage control measures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. relevant sections of the IMO Codes and Conventions and AMSA Marine Orders a.2. NSCV/USL Code a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory Marine and OH&S legislation

Evidence Guide

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS ON BOARD A DOMESTIC VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Prepare contingency plans for emergency response a.2. Develop plans for damage control following a shipboard emergency a.3. Develop plans for fire protection, detection and extinction on board a vessel a.4. Develop procedures for the use of various life-saving appliances a.5. Develop plans for rescue of personnel. a.6. Demonstrate use of lifesaving and survival equipment a.7. Identify typical problems that may occur during a shipboard emergency and take appropriate action a.8. Communicate effectively with others during shipboard emergencies a.9. Document emergency response plans a.10. Prepare shipboard personnel to implement emergency response plans if required
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other relevant mandatory units that form part of a job role of a master or engineer officer on a commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant sections of the IMO Conventions and Codes, AMSA Marine Orders, national standards, codes and regulations as they relate to damage control during shipboard emergencies b. safety management system plans, procedures, checklists and instructions c. Relevant OH&S legislation, codes of practice, policies and procedures d. Requirements for emergency response contingency plans as per international regulations, AMSA Marine Orders, NSCV and company policy e. Potential navigational emergencies for vessels and appropriate action and solutions f. General principles of damage control and the manner in which water-tight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair g. The concept of reserve buoyancy and its relevance to damage control on board vessels h. Statutory requirements pertaining to damage control in vessels i. Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvas and clothing j. Maritime communication techniques used during navigational emergencies k. Mandatory knowledge and skills in personal survival techniques, fire fighting and fire prevention required of all seafarers, as per Section A VI/1 of the IMO STCW 95 Code or the NSCV and relevant national standards and regulations. l. Knowledge of the safety precautions for the entering of confined spaces m. Knowledge of the use of lifesaving and survival equipment
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either</p> <ul style="list-style-type: none"> a.1. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to develop emergency response plans and handle emergency situations on board vessels, and/or a.2. develop or improve emergency response plans on board an operational commercial vessel

Evidence Guide (continued)

DEVELOP EMERGENCY AND DAMAGE CONTROL PLANS AND HANDLE EMERGENCY SITUATIONS ON BOARD A DOMESTIC VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. developing emergency response plans and handling emergencies a.2. identifying and evaluating problems that may occur during a shipboard emergency and determining appropriate courses of action a.3. identifying and implementing improvements to emergency response plans a.4. applying safety and life-saving precautions and procedures during emergency situations on board a vessel a.5. preparing shipboard personnel to implement emergency response plans <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of IMO Conventions and Codes and AMSA Marine Orders and NSCV/USL Code b.2. Safety Management System and procedures b.3. OHS regulations and hazard prevention policies and procedures b.4. issue resolution procedures b.5. job procedures and work instructions b.6. relevant regulations relating to shipboard emergencies and damage control b.7. environmental protection during emergencies <p>c. Action taken promptly to report and/or rectify shipboard emergencies in accordance with statutory requirements and company procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3	1	2	2

TDMMF701B OBSERVE SAFE WORKING PRACTICES AND PROCEDURES ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to implement regulatory requirements for occupational health and safety on board a commercial vessel, including following and applying established maritime safe working practices and procedures and hazard control strategies.

The unit is consistent with the related functional standard in Table A VII/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers. It covers the National Occupational Health and Safety Commission Generic Competency A and is equivalent to the Seafood Industry competency standard SFICORE104A Meet workplace health and safety requirements.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Identify and follow workplace procedures for hazard identification and risk control</p>	<ul style="list-style-type: none"> a. Safety regulations and established vessel's safety and hazard control practices and procedures are obtained, interpreted and applied to day-to-day work activities b. Workplace procedures for Occupational Health and Safety and related work instructions for controlling risks onboard a vessel are accurately followed c. Workplace procedures for dealing with shipboard accidents, fire and emergencies are known and followed d. Hazards in the workplace are identified and appropriate action is taken to report them and to minimise or eliminate risk to personnel, vessel and the environment e. Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are correctly followed f. Personal protection clothing and equipment is correctly used in accordance with established shipboard safety practices and procedures g. Appropriate assistance is provided in the event of a shipboard emergency to secure the vessel and its machinery and equipment and to maintain the safety of the vessel and persons involved h. Established emergency and contingency plans are followed in the event of a shipboard emergency
<p>2. Contribute to arrangements for the management of occupational health and safety</p>	<ul style="list-style-type: none"> a. Occupational Health and Safety issues and identified safety hazards are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation b. Contributions to occupational health and safety management in the workplace are made within workplace procedures and provisions of relevant legislation c. Occupational health and safety issues are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation. d. Contribute to participative arrangements for occupational health and safety management in the workplace within vessel's procedures and scope of responsibilities and competencies
<p>3. Complete Occupational Health and Safety records</p>	<ul style="list-style-type: none"> a. Occupational health and safety records for self are completed in accordance with workplace requirements b. Legal requirements for the maintenance of records of occupational injury and diseases are followed

Range Of Variables

OBSERVE SAFE WORKING PRACTICES AND PROCEDURES ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime and OH&S regulations. b. Safe working practices and procedures and established hazard control strategies are correctly applied to day-to-day work either individually or in a team environment with some accountability for the safety of self and others. c. Day-to-day work involves the application of known and established safe working and hazard control practices and procedures across a variety of normal and emergency contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Work may be conducted in enclosed spaces, exposed conditions and controlled or open environment c. Safe working practices and hazard control strategies must be applied at all times including: <ul style="list-style-type: none"> c.1. by day or night in both normal and emergency situations c.2. under any permissible conditions of weather and loading c.3. while underway c.4. during berthing and unberthing operations c.5. while anchoring or mooring c.6. when slipped or in dry-dock c.7. when bunkering c.8. during cargo, fishing or passenger operations. d. Emergencies may include: <ul style="list-style-type: none"> d.1. loss of propulsion power d.2. loss of electrical power d.3. loss of steerage d.4. flooding of vessel d.5. fire or explosion d.6. loss of refrigeration d.7. loss of water making ability or fresh water stowage d.8. fuel oil, lubrication oil, steam and gas leaks d.9. overheating and overspeed of machinery, governors, emergency trips d.10. cyclones or severe weather conditions e. Workplace hazards may include: <ul style="list-style-type: none"> e.1. moving heavy loads in an unsafe work environment e.2. unsecured machinery, components, cargo or repair equipment e.3. slippery deck e.4. welding equipment e.5. sharp tools and implements e.6. power tools e.7. moving and rotating machinery e.8. flammable liquids, vapours and fuel e.9. faulty machinery equipment handling equipment and lifting gear e.10. using equipment beyond safe working limits e.11. poor housekeeping procedures e.12. non-compliance with safe working procedures e.13. electrical wiring and systems e.14. hot pipes and valves (steam, fuel oil, lubricating oil) e.15. cold pipes and valves (refrigeration and liquefied gas cargoes) e.16. working at heights e.17. exposed electrical circuits e.18. toxic gases and substances e.19. chemicals and other harmful substances e.20. damaged cargo and containers f. Personnel in work area may include vessel's officers and crew, passengers, contractors, official representatives g. Hazard identification may include activities associated with: <ul style="list-style-type: none"> g.1. checking equipment or the work area before work commences and during work g.2. workplace inspections g.3. housekeeping

Range Of Variables (continued)

OBSERVE SAFE WORKING PRACTICES AND PROCEDURES ON BOARD A VESSEL

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>h. Participative arrangements may include:</p> <ul style="list-style-type: none"> h.1. formal and informal meetings which include occupational health and safety h.2. occupational health and safety committees h.3. other committees for example: consultative, planning and purchasing h.4. health and safety representatives h.5. suggestions, requests, reports and concerns put forward by vessel's crew to senior officers <p>i. Designated personnel may include:</p> <ul style="list-style-type: none"> i.1. ship's officers i.2. team leaders i.3. management occupational health and safety personnel i.4. other persons authorised or nominated by the company or ship's officers to: <ul style="list-style-type: none"> i.4.1. perform specified work i.4.2. approve specified work i.4.3. inspect specified work i.4.4. direct specified work
<p>3. Sources of information/ documents</p>	<p>a. Sources of information and documentation may include:</p> <ul style="list-style-type: none"> a.1. ISM Code and safety management system plans, procedures, checklists and instructions, (where applicable), machinery/equipment manuals a.2. vessel and company's safety management policies, emergency contingency plans and procedures a.3. records required under OH&S legislation, for example: <ul style="list-style-type: none"> a.3.1. worker's compensation and rehabilitation records a.3.2. hazardous substances registers a.3.3. Material Safety Data Sheets a.3.4. major accident/injury notifications a.3.5. manufacturers and suppliers OH&S information a.3.6. OH&S audits and inspection reports a.3.7. maintenance and testing reports a.3.8. workplace environmental monitoring and health surveillance records a.3.9. records of instruction and training a.3.10. first aid / medical post records.
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable regulations and legislation may include:</p> <ul style="list-style-type: none"> a.1. relevant sections of Federal and State/Territory and international maritime regulations dealing with OH&S in shipboard workplaces a.2. relevant international, Australian and State/Territory OH&S legislation, particularly: <ul style="list-style-type: none"> a.2.1. OH&S Acts, regulations and codes of practice, including regulations and codes of practice relating to hazards present in the workplace or industry; a.2.2. general duty of care under OH&S legislation and common law; a.2.3. requirements for the maintenance and confidentiality of records of occupational injury and disease; a.2.4. requirements for provision of OH&S information and training; a.2.5. provisions relating to roles and responsibilities of health and safety representatives and/or OH&S committees a.2.6. provisions relating to OH&S issue resolution.

Evidence Guide

OBSERVE SAFE WORKING PRACTICES AND PROCEDURES ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Identify and follow workplace procedures for hazard identification and risk control a.2. Contribute to arrangements for the management of OH&S onboard a vessel a.3. Complete OH&S records and other documentation as required a.4. Communicate effectively with others on workplace safety matters
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel).</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime and OH&S regulations b. ISM Code and other Safety Management System procedures (where applicable) c. The provisions of OH&S Acts, regulations and codes of practice relevant to the workplace, including the rights and responsibilities of the workplace parties under OH&S Acts, regulations and codes of practice; d. The ways in which OH&S is managed in the workplace, and activities required under OH&S legislation, for example: <ul style="list-style-type: none"> d.1. policies d.2. procedures d.3. plant and equipment operation and maintenance d.4. hazard identification d.5. risk assessment and control d.6. OH&S instruction d.7. training and provision of OH&S information e. Hazards that exist in the workplace f. The preferred order of ways to control risks (known as the hierarchy of control); g. Workplace OH&S procedures relevant to the work being undertaken, including procedures for: <ul style="list-style-type: none"> g.1. recognising and reporting on hazards, for example, work area inspections g.2. work operations to control risks, for example, permit to work systems and isolation procedures g.3. responding to accidents, fires and emergencies g.4. raising OH&S issues g.5. employee participation in OH&S management, for example, consultative or OH&S committees and joint employer/employee inspections h. The meaning of OH&S symbols found on signs and labels in the workplace i. Designated personnel responsible for OH&S onboard a vessel
<p>4. Resource implications</p>	<p>Opportunities to either :</p> <ul style="list-style-type: none"> a. Participate in a range of practical and theoretical assignments, exercises, case studies and other assessments that demonstrate the skills and knowledge to contribute to the application of safe working practices and safety hazard control onboard a vessel; and/or b. Contribute to the application of safe working practices and hazard control and safety hazard control on a commercial or training vessel

Evidence Guide (continued)

OBSERVE SAFE WORKING PRACTICES AND PROCEDURES ON BOARD A VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. identifying and following workplace procedures for hazard identification and risk control a.2. contributing to arrangements for the management of OH&S onboard a vessel a.3. completing OH&S records as required a.4. communicating effectively with others on workplace safety matters <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. ISM Code and associated vessel's Safety Management System and procedures (where applicable) b.3. OH&S legislation and regulations and hazard prevention policies and procedures b.4. on-board housekeeping processes b.5. waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify hazards, safety risks and safety incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	1

TDMMF801B COMPLY WITH EMERGENCY PROCEDURES ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to take appropriate initial action on becoming aware of an emergency on board a commercial vessel and to follow established emergency response procedures.

The unit is consistent with the related functional standards in Section A VII/1-4 of the STCW 95 Code and AMSA Marine Orders Part 3, Issue 5, Appendix 4, and the NSCV/Australian USL Code. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Take action on becoming aware of an emergency</p>	<p>a. Emergency situations are correctly recognised and identified</p> <p>b. Response to an emergency situation follows established vessel's emergency response procedures</p> <p>c. Correct action is taken on discovery of an actual or potential emergency in accordance with established vessel procedures</p> <p>d. Information given on raising alarm is prompt, accurate, complete and clear</p>
<p>2. Follow established emergency procedures</p>	<p>a. Vessel's contingency plans for emergency response are known and are implemented in real and simulated emergency situations</p> <p>b. Escape routes and internal and external communications and alarm systems are correctly used in real and simulated emergency situations in accordance with regulatory requirements and established procedures</p> <p>c. Emergency communications and alarm signals and systems are understood and required action implemented in accordance with emergency procedures and regulatory requirements</p> <p>d. Planned damage control procedures for dealing with damage to the vessel and its hull are implemented in accordance with company procedures and regulatory requirements</p>
<p>3. Follow procedures for the use of various life-saving appliances</p>	<p>a. Participation in life saving drills confirms readiness to correctly carry out life-saving procedures and use life-saving appliances</p> <p>b. Procedures for the use of various shipboard life-saving appliances are followed in accordance with regulatory requirements, manufacturer's instructions and company procedures</p>

Range Of Variables

COMPLY WITH EMERGENCY PROCEDURES ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations b. Responses to emergency situations follow a prescribed range of emergency procedures either individually or in a team environment with some accountability for the quality of outcomes c. Responses involve the use of known and defined emergency systems and procedures across a variety of emergency contexts
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Potential emergencies may occur: <ul style="list-style-type: none"> b.1. by day or night b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when bunkering b.7. during cargo handling operations c. Emergencies may include: <ul style="list-style-type: none"> c.1. collision with another vessel c.2. explosion on board vessel c.3. fire on board vessel c.4. impairment of integrity of hull and ingress of water c.5. loss of steering control c.6. loss of motive power c.7. foundering c.8. grounding c.9. beaching a vessel c.10. person overboard c.11. rescue and evacuation of injured personnel c.12. cyclones or severe weather d. Damage control measures in a flooding emergency may include: <ul style="list-style-type: none"> d.1. use of softwood wedges and plugs to reduce water ingress d.2. erection and application of vertical shoring d.3. construction and fitting of a leak-stopping mat d.4. temporary repair of a ruptured pressurised pipe d.5. operation of a portable salvage pump e. Damage control measures in a fire or explosion emergency may include: <ul style="list-style-type: none"> e.1. use of appropriate fire fighting equipment and techniques such as various types of fire extinguishers, fire blankets, fire hoses and nozzles, and foam applicators e.2. activation of fixed fire fighting sprinklers and systems e.3. removal of fuel or heat source e.4. boundary cooling techniques f. Survival equipment may include: <ul style="list-style-type: none"> f.1. life jackets f.2. exposure and immersion suits f.3. survival craft
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. SOLAS Convention a.3. vessel's emergency response procedures a.4. emergency procedures a.5. vessel manufacturer's instructions and recommended procedures for damage control measures a.6. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of the NSCV/Australian USL Code a.3. relevant sections of AMSA Marine Orders a.4. relevant international, Australian and State/Territory Marine & OH&S legislation

Evidence Guide

COMPLY WITH EMERGENCY PROCEDURES ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Take appropriate action in the event of discovering a shipboard emergency a.2. Follow vessel's contingency plans for emergency response a.3. Follow procedures for the use of various life-saving appliances a.4. Implement damage control following a shipboard emergency in accordance with instructions a.5. Identify typical problems that may occur during a shipboard emergency and take appropriate action a.6. Communicate effectively with others during shipboard emergencies a.7. Participate in drills to prepare shipboard personnel to implement emergency response
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Navigational emergencies for vessels and appropriate action and solutions d. Indications of various types of emergency situations and the action to be followed when various types of actual or potential emergency situations are identified e. Emergency alarm signals and systems in use on vessels and procedures to be followed when an emergency alarm is raised f. Escape routes and internal and external communications systems and alarms on board a vessel g. General principles of damage control and the manner in which watertight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair h. Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvas and clothing i. Maritime communication techniques used during navigational emergencies
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of role plays, case studies and/or other simulated practical and knowledge assessments that demonstrate the skills and knowledge to respond to emergency situations onboard a commercial vessel, and/or a.2. follow emergency response plans and procedures during real and simulated emergency situations on board an operational commercial vessel
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. taking initial action during real and simulated emergency situation a.2. implementing emergency during a real and simulated emergency situations a.3. identifying and evaluating problems that may occur during a shipboard emergency and determining appropriate courses of action a.4. applying safety and life-saving precautions and procedures during emergency situations on board vessel a.5. participating in drills aimed at preparing shipboard personnel to implement emergency response plans b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. OH&S regulations and hazard prevention policies and procedures b.3. relevant procedures and regulations relating to shipboard emergencies and damage control b.4. shipboard safety procedures b.5. environmental protection during emergencies c. Action taken promptly to report and/or rectify shipboard emergencies in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

COMPLY WITH EMERGENCY PROCEDURES ON BOARD A VESSEL

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	1	1

TDMMF3201B APPLY DOMESTIC REGULATIONS WHEN OPERATING A SMALL VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to monitor and control compliance with National Standards for Commercial Vessels (NSCV) and other legislative requirements applying to small commercial vessels operating on coastal voyages, including accessing and interpreting current information on the relevant Commonwealth and State and Territory Acts, Legislation, Codes and other publications and applying to vessel operations. It also includes the identification, interpretation and application of information on the responsibilities of vessel's officers and crew under relevant maritime law and the monitoring the compliance of vessel's operations and maintenance with relevant maritime regulations.

The unit is consistent with the relevant sections in the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Access and interpret information on relevant Australian and legislation and codes including the NSCV</p>	<ul style="list-style-type: none"> a. Current documentation on applicable maritime regulations is stored and filed in an accessible location on the vessel in accordance with regulations b. Documentation on applicable maritime regulations is updated with relevant publications c. Relevant maritime regulations are accessed and interpreted to confirm the requirements for vessel's operations and maintenance and personal responsibilities d. Certification extensions for the vessel and requirements for renewals are timely and ensure continuous validity e. Survey items and equipment reflect effective programs of tests, checks and maintenance in accordance with certificate conditions f. Arrangements for renewals and surveys are timely and comply with enterprise and issuing authority requirements g. Vessel's documents indicate any effects of damage, alterations or additions to the vessel or operations in accordance with certification requirements and the procedures of the relevant maritime authority h. Procedures are developed to ensure that only authorised personnel access documents i. Certificates and documentation are stored in a manner which enables their use for the prosecution of vessel's business.
<p>2. Ensure operations and maintenance comply with legal requirements</p>	<ul style="list-style-type: none"> a. Interpretations of relevant sections of applicable maritime regulations are applied to day-to-day operations and maintenance of the vessel b. Procedures are followed for monitoring operations and maintenance according to applicable maritime regulations c. Areas and plant equipment are checked and inspected in accordance with planned procedures d. Problems that may lead to potential non-compliance are promptly and fully identified e. Remedial action is timely and ensures compliance with applicable maritime regulations f. Training and instruction on procedures ensures subordinates comply with regulations g. Advice to others on the legitimacy of operations is accurate and given at an appropriate time h. Failure to comply with procedures is identified and dealt with according to established procedures

3. **Monitor and control compliance with applicable maritime regulations**

- a. Records of compliance are clear concise and accurate
- b. Records comply with applicable maritime regulations
- c. The level and detail is sufficient to meet the objectives for maintaining the records
- d. Documentation is secure and confidentiality is maintained in accordance with established procedures
- e. Computer backup procedures (where relevant) follow good operating practices and enterprise procedures
- f. Records and reports are distributed to the required maritime authority at appropriate times and places
- g. Storage method and duration comply with legal and company requirements.
- h. Vessel is prepared and anchored in varying weather conditions in accordance with applicable regulatory requirements
- i. Anchor is weighed and correct action is taken to proceed in varying weather conditions in accordance with applicable regulatory requirements
- j. Adherence to International Collision Regulations relevant to a domestic vessel operating within offshore waters is demonstrated during vessel operations

Range Of Variables

APPLY DOMESTIC REGULATIONS WHEN OPERATING A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in the achievement of compliance with the applicable maritime regulations. It involves the monitoring and controlling compliance of a vessel's operational and maintenance procedures in relation to applicable maritime regulations.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any small commercial vessel on a coastal voyage b. Compliance with to relevant Australian maritime legislation, codes and NSCV must be maintained: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Types of records include: <ul style="list-style-type: none"> c.1. operational records c.2. maintenance records c.3. personnel matters c.4. safety incident reports d. Recording systems may include <ul style="list-style-type: none"> d.1. computers d.2. manual methods d.3. shipboard recording devices
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. conditions of assignment a.2. relevant statutory certification a.3. crew lists and qualifications a.4. vessel's log a.5. statutory records a.6. relevant maritime regulations
4. Applicable Australian and State/Territory regulations and legislation and NSCV	<ul style="list-style-type: none"> a. Applicable procedures and codes may include: <ul style="list-style-type: none"> a.1. relevant sections of Australian USL Code applicable to small commercial vessels on coastal voyages a.2. NSCV Regulations for Preventing Collisions at Sea a.3. relevant Australian pollution control requirements a.4. SOLAS Convention a.5. relevant Australian and State/Territory OH&S and other legislation

Evidence Guide

APPLY DOMESTIC REGULATIONS WHEN OPERATING A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Access and interpret information on applicable maritime regulations a.2. Apply legal requirements to vessel operation and maintenance a.3. Ensure others comply with legal requirements through training, instruction, advice and assessment a.4. Maintain survey items and prepare appropriately for surveys a.5. Monitor and control compliance of vessel operations and maintenance with applicable maritime regulations a.6. Identify problems with compliance with applicable maritime regulations and initiate appropriate remedial action a.7. Keep records of vessel's operations and maintenance activities in compliance with applicable maritime regulations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master on a small commercial vessel engaged on a coastal voyage.</p>
<p>3. Required knowledge and skills</p>	<p>a. Knowledge of applicable maritime regulations including:</p> <ul style="list-style-type: none"> a.1. sources of information on the regulations a.2. procedures for accessing the regulations a.3. interpretations of the regulations in terms of the roles and responsibilities of the master and crew of a small commercial vessel engaged on coastal voyages <p>b. Awareness and understanding of the specific regulations applicable to the operation of small vessels in relation to:</p> <ul style="list-style-type: none"> b.1. seaworthiness and unsafe vessels b.2. occupational health and safety b.3. operational documentation b.4. safety of navigation b.5. safety manning b.6. search and rescue operations b.7. pollution of the marine environment b.8. penalties for breaches of legislative requirements <p>c. Legal certification requirements for a small vessel engaged on coastal voyages</p> <p>d. Procedures for conducting a legal survey of a vessel in accordance with the requirements of the relevant maritime authority</p> <p>e. Procedures for monitoring compliance with relevant maritime regulations</p> <p>f. Action that must be taken if non-compliance with applicable maritime regulations is identified</p> <p>g. Statutory, company and vessel requirements for the carriage of documentation</p> <p>h. Requirements for records that must be maintained and reports that must be made under applicable maritime regulations</p> <p>i. Knowledge of International Collision Regulations relevant to a domestic vessel under 24m operating within offshore waters</p> <p>j. Knowledge of IALA Buoyage and interaction relevant to shipping a vessel under 12m operating in inshore waters.</p>
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to:</p> <ul style="list-style-type: none"> a.1. demonstrate, through appropriate assignments, role plays and case studies and appropriately simulated maritime situations and case studies, the required knowledge and skills to access, interpret and apply information on regulations relevant to small commercial vessels engaged on coastal voyages, and/or a.2. access, interpret and apply information on regulations during work on board an operational small commercial vessel

Evidence Guide (continued)

APPLY DOMESTIC REGULATIONS WHEN OPERATING A SMALL VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. accessing and interpreting information on applicable maritime regulations a.2. applying legal requirements to vessel operation and maintenance a.3. monitoring and controlling compliance with applicable maritime regulations a.4. keeping required records of vessel's operations and maintenance activities in compliance with applicable maritime regulations <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. applicable maritime regulations b.2. OHS and fire fighting/prevention regulations and hazard prevention policies and procedures b.3. fire fighting/prevention regulations and procedures b.4. search and rescue procedures b.5. safety of life at sea procedures b.6. waste, pollution and recycling management processes <p>c. Action taken promptly to report and/or rectify any non compliance with applicable maritime regulations</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	2	1

TDMMF4502A OPERATE BREATHING APPARATUS ON BOARD A VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to operate self-contained breathing apparatus on board a vessel in accordance with regulatory requirements, and vessel and company procedures, including conducting required pre-donning checks and tests, donning and checking the breathing apparatus, operating the self-contained breathing apparatus and correctly concluding operations.

ELEMENT	PERFORMANCE CRITERIA
1. Conduct pre-donning checks and tests on breathing apparatus on board a vessel	<ul style="list-style-type: none"> a. Breathing apparatus is inspected for immediate use in accordance with the vessel's procedures and IMO requirements (SOLAS) b. Faulty or damaged equipment is reported and recorded in accordance with the vessel's procedures
2. Don and check breathing apparatus	<ul style="list-style-type: none"> a. By DO: This is cumbersome expression. Suggest Breathing apparatus is donned in accordance with procedures b. Breathing apparatus is started and checked in accordance with procedures c. Breathing apparatus control procedures are followed in accordance with procedures d. Ancillary equipment required for the task is correctly selected for use
3. Operate self-contained breathing apparatus on board a vessel	<ul style="list-style-type: none"> a. Hazards are identified, monitored and controlled in accordance with the procedures b. Communication is established and maintained with members and other appropriate personnel throughout the activity c. Procedures for donning and starting up self-contained breathing apparatus on board a vessel are correctly applied d. Procedures for the logging of the logging? of self-contained breathing apparatus operators on a BA Control Board is correctly flowed in accordance with vessel's procedures and accepted fire-fighting practice. e. Search and rescue operations in a smoke filled environment are correctly conducted as a member of a fire-fighting team in accordance with accepted fire-fighting practice f. Entrapment procedures are implemented in accordance with the vessel's procedures g. Personal safety is maintained at all times
4. Conclude operations	<ul style="list-style-type: none"> a. Self-contained breathing apparatus set on board a vessel is closed down in accordance with procedures b. Self-contained breathing apparatus set on board a vessel is removed in accordance with the procedures

Range Of Variables

OPERATE BREATHING APPARATUS ON BOARD A VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs and some responsibility for others in the achievement of compliance with the applicable maritime regulations. It involves the operation of breathing apparatus on board a vessel in a range of operational contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel b. Types of breathing apparatus may include open circuit c. Types of irrespirable atmospheres may include: <ul style="list-style-type: none"> c.1. heated atmospheres c.2. asphyxiating atmosphere (oxygen deficient) c.3. (non-skin absorption) toxic or poisonous atmosphere c.4. smoke or suspended particles/fibres in atmosphere d. Pre-use tests and checks may include: <ul style="list-style-type: none"> d.1. serviceability of components d.2. integrity of components cylinder pressure d.3. integrity of air flow system d.4. ancillary equipment e. Breathing apparatus control equipment may include: <ul style="list-style-type: none"> e.1. control boards e.2. breathing apparatus set tallies e.3. entry control officer identification guideline and branch line tallies procedures e.4. personal lines f. Breathing apparatus control may include: <ul style="list-style-type: none"> f.1. principles of BA control f.2. vessel procedures f.3. stage 1 (one entry point) f.4. stage 2 (multiple entry points) f.5. entry/exit control point f.6. timing device g. Entrapment procedures may include: <ul style="list-style-type: none"> g.1. cease all strenuous activity g.2. activate the distress signal unit g.3. remain calm g.4. relocate to safes available place g.5. call for assistance h. Communication may include: <ul style="list-style-type: none"> h.1. distress signal unit h.2. portable radio h.3. communications sets h.4. signal lines h.5. hand signals g. Hazards may include: <ul style="list-style-type: none"> g.1. fire g.2. failure to maintain a face seal g.3. exhaustion of air supply g.4. malfunction of equipment g.5. disorientation in smoke/darkness or confinement g.6. structural hazards and/or hazardous materials g.7. entrapment

Range Of Variables (continued)

OPERATE BREATHING APPARATUS ON BOARD A VESSEL

VARIABLE	SCOPE
3. Sources of information/ documents	a. Sources of information and documentation may include: a.1. operational orders a.2. coastal navigation charts a.3. NSCV/Australian USL code a.4. vessel's log a.5. company procedures a.6. instruction of relevant maritime Authorities a.7. manufacturers instructions a.8. IMO requirements (SOLAS)
4. Applicable regulations and legislation	a. Applicable regulations and legislation may include a.1. relevant sections of Australian USL Code applicable to vessels a.2. relevant NSCV regulations a.3. regulations for preventing collisions at sea a.3. relevant Australian and State/Territory OH&S legislation a.4. national legislation eg Marine Orders

Evidence Guide

OPERATE BREATHING APPARATUS ON BOARD A VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. comply with the relevant Maritime regulations a.2. appropriate conduct pre-donning tests a.3. correct don breathing apparatus a.4. move in conditions or reduced visibility a.5. implement breathing apparatus emergency procedures a.6. follow standard operating procedures a.7. follow company procedures a.7. follow vessel/safety management system procedures a.8. correctly remove breathing apparatus a.9. return breathing apparatus to operational status
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master of a vessel up to 80 metres in length engaged on a coastal voyage</p> <p>Many people doing this will not be potential Masters (ie deckhands and engineers) Recommend change as follows:</p> <p><i>"This unit of competency must be assessed in conjunction with other mandatory units that form part of emergency training"</i></p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant maritime regulations b. Relevant OH&S legislation and policies c. Knowledge of respiratory systems, effects of irrespirable atmospheres on the body, operation of compressed air, breathing apparatus d. Knowledge of operational testing, standard operating procedures and safe work practices when wearing breathing apparatus e. Operating breathing apparatus f. Use of the Distress Signal Units g. Use of the breathing apparatus control equipment h. Use of procedures, personal lines and tallies i. Inspecting, donning, operating in, removal, cleaning, maintaining and returning to operational status of breathing apparatus
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to operate breathing apparatus on board a vessel, and/or a.2. operate breathing apparatus and associated equipment in a range of controlled or simulated scenarios
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Evidence should be gathered over a period of time in a range of actual or simulated workplace environments b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. OH&S regulations and hazard b.2. relevant maritime regulations b.3. prevention policies and procedures b.4. job procedures and work instructions c. Work is completed systematically with required attention to detail

Evidence Guide (continued)

OPERATE BREATHING APPARATUS ON BOARD A VESSEL

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. At the registered training organisation, and/or
 - b.2.2. On an appropriate working or training vessel

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

TDMMF4702A CONTRIBUTE TO MAINTAINING A SAFE WATCH ON A DOMESTIC VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required by either the Master or Watchkeeper to contribute to a safe navigational watch on a small domestic commercial vessel and in compliance with Australian and international regulations and guidelines to ensure the safety of navigation, protection of the marine environment and the safety of the vessel and the persons on board.

The unit is consistent with the relevant functional standard in the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Contribute to watchkeeping procedures</p>	<ul style="list-style-type: none"> a. Effective communication with the Master is correctly maintained at all times on matters relevant to the safety of the vessel during watchkeeping duties b. Wheelhouse communications are clear and concise and advice or clarification is sought from the Master when watch information or instructions are not clearly understood c. A proper look-out is maintained at all times and in such a way as to conform to accepted principles and procedures and regulatory requirements d. Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognised e. The frequency and extent of monitoring of traffic, the vessel and the environment conform with established principles and procedures f. Internal and external communications systems are used in accordance with bridge procedures and manufacturer's instructions g. Precautions and procedures are followed to implement environmental protection measures h. Fatigue management strategies are correctly applied within the bridge management team
<p>2. Respond to potential emergency situations</p>	<ul style="list-style-type: none"> a. Observations and emergency situations are promptly reported to the master in accordance with procedures b. Distress signals are recognised and reported in accordance with procedures

Range Of Variables

CONTRIBUTE TO MAINTAINING A SAFE WATCH ON A DOMESTIC VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant sections of USL Code, NSCV and guidance published by Marine Authorities and (where relevant) the AMSA Marine Orders and IMO STCW 95 Code and Convention. b. Work is performed under the direction of the Master as a Watchkeeper on a small domestic vessel in accordance with defined operational requirements, with some accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of look out and observational techniques across a variety of operational contexts. Following of orders and instructions of the Master is required.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel is restricted to an Australian domestic vessel only b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Watchkeeping principles include: <ul style="list-style-type: none"> c.1. proper lookout must be maintained at all times c.2. management of the steering and heading of the vessel c.3. look-out must give full attention to keeping a proper look out and must not carry out other duties which could interfere with the task c.4. all necessary precautions must be taken to avoid pollution of the marine environment c.5. appropriate assistance must be available to be summoned to the bridge if required by a change in the vessel's situation d. Fatigue management strategies may include: <ul style="list-style-type: none"> d.1. recognition of symptoms of fatigue d.2. arranging to take a break when symptoms of fatigue are identified d.3. maintenance of personal fitness and health d.4. appropriate dietary habits d.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties e. Emergencies may include: <ul style="list-style-type: none"> e.1. fire e.2. stranding e.3. possible collision e.4. heavy weather e.5. synchronous rolling e.6. distress signal e.7. failure of bridge equipment, steering equipment, navigational lights e.8. loss of main engines or propulsion controls e.9. man overboard e.10. fog and restricted visibility e.11. cargo shift e.12. retrieval of survivors from the water e.13. loss of watertight integrity e.14. intoxicated persons on board a vessel e.15. dragging anchor e.16. fouled hawse e.17. loss of mooring lines or winches when berthing e.18. entry into confined spaces e.19. personnel working aloft or overside e.20. sudden list or loll e.21. cyclones

Range Of Variables (continued)

CONTRIBUTE TO MAINTAINING A SAFE WATCH ON A DOMESTIC VESSEL

VARIABLE	SCOPE
3. Sources of information/ documents	a. Sources of information and documentation may include: a.1. Safety management system plans, procedures, checklists and instructions a.2. orders and instructions of the officer on watch a.3. procedures for reporting emergencies and observations to the Master a.4. instructions of relevant Maritime Authorities a.5. relevant Australian standards
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable regulations and legislation may include: a.1. USL Code a.2. NSCV a.3. International Regulations for Preventing Collisions at Sea a.4. relevant international, Australian and State/Territory Marine and OH&S legislation

Evidence Guide

CONTRIBUTE TO MAINTAINING A SAFE WATCH ON A DOMESTIC VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Contribute to watch keeping arrangements and procedures a.2. Fulfil responsibilities of watchkeeper during a watch a.3. Report observations and other emergency situations arising during a watch a.4. Communicate effectively with others in the course of watchkeeping duties
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of watchkeeper on a small domestic vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant Marine & OH&S legislation, codes of practice, policies and procedures b. Wheelhouse procedures on board a vessel c. Functions and responsibilities of the members of a wheelhouse team onboard a vessel d. Procedures for the relief, maintenance and handover of a watch e. Procedures for the use of internal communications and alarm systems f. Factors that can affect watchkeeping functions g. Causes of groundings, collisions and casualties when on board a vessel h. Navigational hazards and implications for watchkeeping i. Typical watchkeeping problems and emergency situations and appropriate action and solutions j. Bridge instrumentation, controls and alarms relevant to the functions of a watchkeeper k. Functions of machinery space controls, alarms and indicators l. Rudder and propeller control automated steering systems and vessel manoeuvring characteristics m. Signs of fatigue n. Fatigue management principles and techniques o. Basic environmental protection measures p. Maritime communication techniques onboard a vessel q. Procedures for the calculation of height and time of high and low water at places listed in tide tables.
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to contribute to a safe watch in range of suitably-simulated of watchkeeping situations relevant to the role of a watchkeeper on a small commercial vessel; and/or a.2. contribute to maintaining a safe watch as a watchkeeper on a commercial vessel in an appropriate range of situations and weather and sea conditions
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1 carrying out watchkeeping duties a.2 identifying watchkeeping problems and reporting them to the Master a.3 applying safety precautions relevant to the role of watchkeeper a.4 reporting observations and other potentially dangerous situations to the Master a.5 communicating effectively with the Master in matters relevant to watchkeeping duties b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1 Ship's Safety Management System and procedures b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant guidelines relating to the role of watchkeeper on board a vessel b.5 bridge housekeeping processes c. Action taken promptly to report watchkeeping incidents in accordance with established procedures d. Work is completed systematically with required attention to detail

Evidence Guide (continued)

CONTRIBUTE TO MAINTAINING A SAFE WATCH ON A DOMESTIC VESSEL

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	2	1	1	2

TDMMF4802A EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A DOMESTIC VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to execute watchkeeping arrangements and behaviour on a small commercial vessel engaged on a coastal voyage that comply with the watchkeeping principles and bridgework procedures specified in the relevant regulations

The unit is consistent with relevant sections of the NSCV/Australian USL Code

ELEMENT	PERFORMANCE CRITERIA
<p>1. Carry out watchkeeping procedures</p>	<ul style="list-style-type: none"> a. The conduct, handover and relief of the watch conform with accepted principles and vessel's procedures b. A proper look-out is maintained at all times and in such a way as to conform to accepted principles and procedures and regulatory requirements c. The vessel is navigated safely using appropriate visual and electronic techniques to check position and to keep it on the coastal track laid down d. The progress of the vessel along a prepared coastal track is analysed and speed and course adjusted as appropriate to maintain a required estimated time of arrival at a point on the track e. Lights, shapes and sound signals conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and are correctly recognised f. The frequency and extent of monitoring of traffic, the vessel and the environment conform with accepted principles and procedures g. Responsibility for the safety of navigation is clearly defined at all times, including periods when the master is on the bridge and while under pilotage h. Safe navigational practice is achieved through the implementation of accepted bridge resource management principles and procedures i. IALA Buoyage System is correctly used, as required, to aid the safe navigation of a vessel engaged on a coastal voyage vessel j. Fatigue management strategies are correctly applied within the bridge management team
<p>2. Respond to potential collision and emergency situations</p>	<ul style="list-style-type: none"> a. Potential collision situations are analysed and appropriate action is taken in ample time and in accordance with regulatory requirements b. Correct responses are made to emergencies and situations that pose a danger to the vessel and personnel on board c. Distress signals are recognised and appropriate action is taken to initiate search and rescue procedures
<p>3. Maintain watchkeeping records</p>	<ul style="list-style-type: none"> a. A proper and accurate record is maintained of the movements and activities relating to the navigation of the vessel b. Appropriate entries pertaining to the watch are recorded in the vessel's log

Range Of Variables

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A DOMESTIC VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations b. Work is performed as a member of a bridge team within defined operational requirements and with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of nautical principles and watchkeeping techniques during the execution of watchkeeping arrangements on a vessel up to 80 metres in length engaged on a coastal voyage. c. Some discretion and judgement may be required in anticipating and dealing with possible watchkeeping problems, navigation and safety hazards and contingencies that may arise and initiating appropriate action.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel up to 80 metres in length engaged on a coastal voyage b. Watchkeeping arrangements and procedures may be implemented: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor c. Watchkeeping principles (as laid out in the relevant regulations) include: <ul style="list-style-type: none"> c.1. proper lookout must be maintained at all times c.2. duties of look out and helmsman must be kept separate c.3. look-out must give full attention to keeping a proper look out and must not be given other duties which could interfere with the task c.4. all necessary precautions must be taken to avoid pollution of the marine environment c.5. appropriate assistance must be available to be summoned to the bridge if required by a change in the vessel's situation d. Fatigue management strategies may include: <ul style="list-style-type: none"> d.1. recognition of symptoms of fatigue d.2. arranging to take a break when symptoms of fatigue are identified d.3. maintenance of personal fitness and health d.4. appropriate dietary habits d.5. avoidance of excessive consumption of alcohol prior to watchkeeping duties e. Emergencies and potentially dangerous navigational situations may include: <ul style="list-style-type: none"> e.1. fire e.2. beaching e.3. stranding e.4. possible collision e.5. heavy weather e.6. synchronous rolling e.7. distress signal e.8. failure of bridge equipment, steering equipment, navigational lights e.9. loss of main engines e.10. man overboard e.11. fog and restricted visibility e.12. cargo shift e.13. retrieval of survivors from the water e.14. loss of watertight integrity e.15. intoxicated persons on board vessel e.16. dragging anchor e.17. fouled hawse e.18. loss of mooring lines or winches when berthing e.19. entry into confined spaces e.20. personnel working aloft or overside e.21. sudden list or loll

Range Of Variables (continued)

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A DOMESTIC VESSEL

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>f. Available navigational aids may include:</p> <ul style="list-style-type: none"> f.1. radar f.2. electronic position-indicating devices f.3. other equipment affecting the safe navigation of the vessel <p>g. Factors to be taken into account when executing watchkeeping duties include:</p> <ul style="list-style-type: none"> g.1. bridge must never be left unattended g.2. weather and sea conditions, visibility and whether there is daylight or darkness g.3. proximity of navigational hazards g.4. use and operational condition of navigational aids g.5. the operational status of bridge instrumentation, controls and alarms g.6. provision on the bridge of unmanned machinery space (UMS) controls, alarms and indicators g.7. unusual demands on the navigational watch arising from operational conditions g.8. traffic density and other activities occurring in the area in which the vessel is navigating g.9. the size of the vessel and the field of vision available from the conning position g.10. the attention necessary when navigating in or near traffic separation schemes or other routing measures g.11. rudder and propeller control and vessel manoeuvring characteristics
<p>3. Sources of information/documents</p>	<p>a. Sources of information and documentation may include:</p> <ul style="list-style-type: none"> a.1. operational orders a.2. coastal navigation charts a.3. NSCV/Australian USL as it relates to watchkeeping functions and operations on small vessels a.4. vessel's log a.5. company procedures a.6. instructions of relevant Maritime Authorities
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable regulations and legislation may include:</p> <ul style="list-style-type: none"> a.1. relevant sections of the NSCV/Australian USL Code related to vessels up to 80 metres in length engaged on coastal voyages a.2. regulations for preventing collisions at sea a.3. relevant Australian and State/Territory OH&S legislation

Evidence Guide

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A DOMESTIC VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Implement watch keeping arrangements and procedures on a vessel up to 80 metres in length engaged on a coastal voyage a.2. Fulfil watchkeeping responsibilities and apply watchkeeping principles a.3. Take appropriate action in the event of a potential collision or other emergency situation arising during a watch a.4. Communicate effectively with others in the course of watchkeeping duties
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master of a vessel up to 80 metres in length engaged on a coastal voyage.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of sections of relevant maritime regulations b. Relevant OH&S legislation and policies c. Procedures for the use of the IALA Buoyage System d. Implications of a range of factors that can affect watchkeeping functions on a vessel up to 80 metres in length engaged on a coastal voyage e. Causes of groundings, collisions and casualties when on board vessel f. Typical navigational hazards and implications for watchkeeping on a vessel up to 80 metres in length engaged on a coastal voyage g. Operating procedures for typical navigational aids and skills and knowledge needed to use them effectively h. Watch handover procedures i. Watchkeeping problems and emergency situations for commercial vessels up to 80 metres in length engaged on a coastal voyages and appropriate action and solutions j. Manual and electronic navigational aids available to the bridge team and the procedures for their operation and use during a watch k. Instrumentation, controls and alarms on a vessel up to 80 metres in length engaged on a coastal voyage l. Rudder and propeller control and vessel manoeuvring characteristics m. Precautions necessary when navigating in or near traffic separation schemes or other routing measures n. Fatigue management principles and techniques including: <ul style="list-style-type: none"> n.1. signs of fatigue n.2. ways of controlling fatigue n.3. action to be taken when fatigued o. Maritime communication techniques require during watchkeeping functions p. An understanding of the Australian marine search and rescue system q. A basic understanding of principles of GMDSS system. r. An understanding of the use of visual signalling methods – flags and light. s. Procedures for coding and decoding the International Code of Signals and other documents relating to visual signals in Australia and international waters.
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to maintain a safe watch through a range of suitably-simulated watchkeeping situations, exercises and case studies and/or a.2. maintain a safe watch on a commercial vessel up to 80 metres in length engaged on a coastal voyage over an appropriate range of situations and weather and sea conditions

Evidence Guide (continued)

EXECUTE WATCHKEEPING ARRANGEMENTS AND PROCEDURES ON A DOMESTIC VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1 executing watchkeeping arrangements on a vessel up to 80 metres in length engaged on a coastal voyage a.2 identifying and evaluating watchkeeping problems and determining an appropriate courses of action a.3 identifying and implementing improvements to bridge management procedures a.4 applying safety precautions relevant to watchkeeping operations a.5 dealing with potential collisions and other potentially dangerous situations arising during a watch <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1 relevant maritime regulations b.2 OHS regulations and hazard prevention policies and procedures b.3 job procedures and work instructions b.4 relevant guidelines relating to bridge management and watchkeeping arrangements on board vessel b.5 bridge housekeeping processes <p>c. Action taken promptly to report and/or rectify watchkeeping incidents in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3	2	2

TDMMF5302A FIGHT AND EXTINGUISH FIRES ON BOARD A SMALL VESSEL

Field MF Operational Quality and Safety

DESCRIPTION:

This unit involves the skills and knowledge required to fight and extinguish fires onboard a commercial vessel, including operating portable fire-fighting equipment, recharging portable fire extinguishers and carrying out fire-fighting operations.

The unit is consistent with the related functional standard in Table A VI/1-2 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 4, and the NSCV/Australian USL Code. It forms part of mandatory minimum requirements for familiarization and basic safety competence required for all seafarers.

ELEMENT	PERFORMANCE CRITERIA
1. Operate portable fire-fighting equipment	<ul style="list-style-type: none"> a. A, B, C, D, E and F classes of fires are correctly identified in accordance with accepted fire-fighting practice b. Correct portable fire-fighting equipment is selected and used to fight specific classes of fires c. Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice d. Correct techniques are applied for the use of hose lines to extinguish fires on board a vessel e. Where applicable, correct techniques are applied for the setting up of foam making equipment to extinguish B Class fires on board a vessel
2. Recharge portable fire extinguishers (where applicable)	<ul style="list-style-type: none"> a. Where applicable, correct techniques are used to recharge the various types of portable fire extinguisher b. Portable fire-fighting equipment is confirmed as operational following recharging
3. Carry out fire-fighting operations	<ul style="list-style-type: none"> a. Correct procedures and techniques are followed when fighting fires in simulated or real fire emergencies b. Safety clothing, appliances and equipment are appropriate to the nature of the fire-fighting operations c. Extinguishment of a fire is achieved using appropriate procedures, techniques, equipment and fire-fighting agents d. Correct portable fire-extinguisher(s) are selected and used for the class of fire involved in a fire emergency e. Appropriate safety precautions and procedures are applied when fighting fires in accordance with regulatory requirements, vessel's procedures and established fire-fighting practice f. The timing and sequence of individual actions when fighting fires onboard a vessel are appropriate to the prevailing circumstances and conditions g. Upper deck and below deck fires are extinguished using appropriate fire fighting equipment and procedures as a member of a fire-fighting team in accordance with accepted fire-fighting practice h. Lifeline signals are correctly used during interior fire-fighting operations i. A compartment filled with high expansion foam is correctly entered as per accepted fire-fighting practice

Range Of Variables

FIGHT AND EXTINGUISH FIRES ON BOARD A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant maritime regulations. b. Work is performed as a member of a team within defined fire-fighting situations, with some responsibility for self and others in achieving the prescribed outcomes. c. Work involves the application of prescribed principles and practice to the prevention and fighting of fires on board a vessel. Participation as a member of a fire-fighting team is involved. d. Work requires some judgement and teamwork in the execution of prescribed procedures for the fighting of fires that may occur onboard a vessel.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Fires on board a vessel may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while in port b.7. while moored or at anchor b.8. loading or unloading c. Types of fires which may occur on board a vessel include Classes A, B, C, D, E and F in the standard classification of fires d. Fire-fighting equipment, appliances and systems may include: <ul style="list-style-type: none"> d.1. portable fire extinguishers including foam, water, CO₂, dry chemical and wet foam d.2. fire blankets d.3. CO₂ fixed systems d.4. foam installations including semi-portable and fixed systems d.5. sprinkler systems d.6. fire pumps (main and emergency fire pump) d.7. fire hoses, hydrants, branches and international shore connection e. Personal protection clothing and equipment may include: <ul style="list-style-type: none"> e.1. firemans outfit e.2. self contained breathing apparatus e.3. fire-resistant clothing e.4. masks e.5. eye and ear protection e.6. gloves e.7. boots f. Consumable materials and items that may used in fire detection and fire fighting equipment may include: <ul style="list-style-type: none"> f.1. Dry and wet chemicals used in fire extinguishers f.2. Batteries for fire detectors
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. fire-fighting and safety equipment operational and maintenance instructions and recommended procedures a.3. instructions of relevant Maritime Authorities related to the maintenance and serviceability of ship-board fire- fighting and safety equipment and systems
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. the NSCV/Australian USL Code a.4. international regulations for the maintenance of fire-detection, fire- fighting and safety equipment and systems a.5. relevant international, Australian and State/Territory marine and OH&S legislation

Evidence Guide

FIGHT AND EXTINGUISH FIRES ON BOARD A SMALL VESSEL

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none"> a. Assessment must confirm appropriate knowledge and skills to: <ul style="list-style-type: none"> a.1. Participate in simulated on-board fire-fighting activities a.2. Participate in search and rescue and fire-fighting teams a.3. Implement OHS principles and policies when carrying out fire-fighting duties a.4. Communicate effectively with others as required during fire emergencies
2. Interdependent assessment of units	<ul style="list-style-type: none"> a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of any seafarer. (It is a mandatory requirement for all seagoing personnel)
3. Required knowledge and skills	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. ISM Code and associated ship's Safety Management System and procedures, where relevant c. The chemistry of fire and its relationship to materials typically carried on vessels d. Principles underlying the spread of fire and its extinguishment e. The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment f. Fire-fighting clothing, outfits and personal safety equipment used when fighting a fire onboard a vessel g. Types fire-fighting appliances, equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance h. Fixed fire prevention and extinguishing installations used on vessels and their principles of operation i. Fire-fighting techniques, agents and precautions applicable to different classes of fire on board a vessel j. Maritime communication techniques applicable to fire-fighting activities onboard a vessel k. Typical problems that can occur with shipboard fire-fighting equipment and operations and appropriate remedial action and solutions l. Sources of information on shipboard fire prevention and extinguishment
4. Resource implications	<ul style="list-style-type: none"> a. Access is required to opportunities to either: <ul style="list-style-type: none"> a.1. carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to carry out fire fighting activities on board a vessel, and/or a.2. assist in fire-fighting drills on board an operational vessel <p><i>Note:</i> Simulated fire-fighting assessment exercises may require access to a fire training and assessment facility capable of simulating fire-fighting activities in a marine environment. Assessments must be conducted in accordance with relevant OH&S requirements. Protective clothing must be worn in accordance with current maritime practices and Australian OHS standards. Simulated conditions should provide truly realistic simulated shipboard conditions including, where practical, conduct of activities in darkness.</p>

Evidence Guide (continued)

FIGHT AND EXTINGUISH FIRES ON BOARD A SMALL VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. implementing the implementation of fire prevention measures and procedures a.2. identifying and evaluating fire fighting problems and determining appropriate courses of action a.3. participating as a member of an interior search and rescue and fire-fighting team on board a vessel a.4. assessing the operational capability of fire-fighting appliances, equipment and systems and taking any required maintenance or replenishment action <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. ISM Code Safety Management System procedures, where applicable b.3. OHS regulations and hazard prevention policies and procedures b.4. relevant manufacturer's guidelines relating to the use of fire-detection and fire-fighting equipment and systems, including instructions on equipment capability and limitations b.5. on-board housekeeping practices and fire-hazard prevention measures b.6. fire prevention procedures and policies <p>c. Action taken promptly to report and/or rectify fire hazards and faulty fire-detection and fire-fighting, equipment and systems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	3	1	1	2

TDMMH1102A USE RADAR TO MAINTAIN SAFE NAVIGATION

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to maintain safe navigation of a commercial vessel through the use of radar and other navigational aids. This includes initialisation and operation of radar and other modern navigational systems, interpreting all available navigational data and using it for avoiding collisions and ensuring the safe navigation of the vessel.

The unit is consistent with the related functional standard in the National Standard for Commercial Vessels.

This unit when combined with TDM MH3 (ARPA) is equivalent to TDM MH5.

ELEMENT	PERFORMANCE CRITERIA
1. Set up radar	<ul style="list-style-type: none"> a. Radar is initialised and used in accordance with established procedures and manufacturer's instructions to assist in the safe navigation of the vessel b. Operational performance and accuracy of the radar is confirmed and appropriate action taken where performance is out of limits c. Misrepresentations and false echoes are detected and discounted
2. Use radar and GPS/DGPS	<ul style="list-style-type: none"> a. Radar and GPS/DGPS is operated in accordance with manufacturer's instructions to produce data on the position of other vessels and fixed objects b. Data produced by the radar and GPS/DGPS is interpreted and used to assist navigational command decisions, taking into account known limitations and errors associated with the equipment c. A radar plot is constructed on a radar plotting sheet using systematic radar observations d. Data on the radar plotting sheet is interpreted and analysed to anticipate potential collisions e. Information obtained through the a single vessel or multiple vessel analysis of the radar plots is used to make inform command decisions on action needed to avoid collision f. Radar plot is correctly constructed and used to determine avoiding action when necessary g. Radar data is used to obtain a position fix for the vessel using electronic bearing lines and variable range markers
3. Maintain navigational records	<ul style="list-style-type: none"> a. Plotting sheets used to analyse navigational situations and to inform command decisions are stored in accordance with company procedures and regulatory requirements b. Records of navigational data produced by radar and GPS/DGPS is stored electronically or in hard copy as required by company procedures and regulatory requirements

Range Of Variables

USE RADAR TO MAINTAIN SAFE NAVIGATION

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulations b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes c. Work involves the use of radar and GPS/DGPS to assist the safe navigation of a vessel across a wide and often unpredictable variety of navigational situations. Implementation of operational strategies and procedures for the use of radar and GPS/DGPS to maintain the safe navigation of the vessel is required. Limited accountability and responsibility for self and others in achieving the outcomes is involved d. Work requires judgement in operational functions related to the use of electronic navigational aids to maintain the safe navigation of a commercial vessel
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Radar and GPS/DGPS may be operated to support command navigational decisions: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of weather and loading b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring c. Equipment may include: <ul style="list-style-type: none"> c.1. radar c.2. GPS and DGPS satellite systems as applied to navigation problems c.3. Integrated navigation systems d. The use of radar and GPS/DGPS to assist safe navigation may include: <ul style="list-style-type: none"> d.1. avoidance of collision with another vessel d.2. fixing the position of the vessel d.3. tracking of other vessels d.4. assistance in making of command navigational decisions d.5. navigating during search and rescue operations
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. relevant maritime regulations a.2. operational orders a.3. navigational charts a.4. radar plotting charts a.5. International Regulations for Preventing Collisions at Sea a.6. safety management system plans, procedures, checklists and instructions (where relevant) a.7. vessel's log a.8. company procedures for the use of navigational aids a.9. systems manufacturers' instructions and recommended procedures a.10. instructions of relevant Maritime Authorities a.11. relevant Australian and international standards
4. Applicable Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable domestic regulations and legislation may include: <ul style="list-style-type: none"> a.1. IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. NSCV/Australian USL Code a.4. International Regulations for Preventing Collisions at Sea a.5. relevant international, Australian and State/Territory marine and OH&S legislation

Evidence Guide

USE RADAR TO MAINTAIN SAFE NAVIGATION

1. Critical aspects of evidence to be considered	<ul style="list-style-type: none">a. Assessment must confirm appropriate knowledge and skills to:<ul style="list-style-type: none">a.1. Initialise and operate radar and GPS/DGPSa.2. Interpret and analyse data generated by radar and GPS/DGPS systems and use it to inform navigational command decisionsa.3. Use data generated by radar and GPS/DGPS systems to fix the position of the vessela.4. Use data generated by radar and GPS/DGPS systems to plot the tracks of other vesselsa.5. Identify typical problems in the use of radar and GPS/DGPS systems and take appropriate actiona.6. Communicate effectively with others when using radar and GPS/DGPS aids to assist in the safe navigation of the vessel
2. Interdependent assessment of units	<ul style="list-style-type: none">a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an officer on a commercial vessel.
3. Required knowledge and skills	<ul style="list-style-type: none">a. Knowledge of relevant maritime regulationsb. Terminology and principles of operation of radar and GPS/DGPS typically used on vesselsc. The different types of electronic navigational aids including their features, key applications and operational characteristicsd. Procedures for the initialisation and operation of radar, and various other types of electronic navigational aidse. Techniques for the use of relevant electronic navigation systems including:<ul style="list-style-type: none">e.1. GPS and DGPS satellite systems as applied to navigation problemse.2. Integrated navigation systemsf. The limitations and potential errors associated with each type of electronic navigational aidg. Methods for the interpretation and analysis of navigational data produced by radar, and various other types of electronic navigational aids including due allowance for the limitations and potential errors associated with each type of electronic navigational aidh. Procedures for the use of data generated by radar, and various other types of electronic navigational aids to assist in the safe navigation of the vesseli. Maritime communication techniques when using radar and GPS/DGPS aids to assist in the safe navigation of a vesselj. Typical problems in the use of radar and GPS/DGPS systems to aid the navigation and appropriate courses of action and solutions
4. Resource implications	<ul style="list-style-type: none">a. Access is required to opportunities to either:<ul style="list-style-type: none">a.1. carry out navigation assignments or exercises using an appropriate electronic navigation simulator over a representative range of navigational incidents; and/ora.2. use radar and GPS/DGPS aids to maintain safe navigation during sea time on the voyage of a commercial or training vessel

Evidence Guide (continued)

USE RADAR TO MAINTAIN SAFE NAVIGATION

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. using radar and GPS/DGPS to assist in the safe navigation of the vessel a.2. identifying and evaluating problems in the use of radar and GPS/DGPS and the navigational data they produce and determining an appropriate courses of action a.3. identifying and implementing improvements to procedures for the use of radar and GPS/DGPS for the safe navigation of the vessel a.4. assessing operational capability of various types of radar and GPS/DGPS aids b. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> b.1. relevant maritime regulations b.2. vessel's Safety Management System and procedures (where applicable) b.3. OHS regulations and hazard prevention policies and procedures b.4. job procedures and work instructions b.5. relevant manufacturer's guidelines relating to the use of electronic navigational aids b.6. security procedures when using radar and GPS/DGPS aids c. Action taken promptly to report and/or rectify problems in the use of radar and GPS/DGPS in accordance with statutory requirements and company procedures d. Work is completed systematically with required attention to detail
Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	3	3	3

TDMMH1202A PLAN AND NAVIGATE A SHORT VOYAGE WITHIN INSHORE LIMITS

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to navigate a small vessel less than 12 metres in length on a short voyage within inshore limits. This includes the use of a navigational chart, determination of a vessel's position, the use of a magnetic compass and the gathering of weather forecast information.

The unit is consistent with the relevant functional standard in the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Use a navigational chart	<ul style="list-style-type: none"> a. Coastal navigational charts are correctly used to plan a safe route and identification of coastal features, lights, buoyage and navigational hazards b. The compass course to steer between two points is estimated
2. Fix a small vessel's position	<ul style="list-style-type: none"> a. Estimates are made of ranges and bearings from charted features, combined with depth soundings and plotted onto a chart b. A position on a chart from derived GPS readings is plotted in accordance with established procedures
3. Obtain weather and tidal information	<ul style="list-style-type: none"> a. Weather forecast current for planned voyage is obtained from coast radio station, internet and media. b. Local tide tables are used to determine times and heights of low and high tides. c. Depth of water at locations on a coastal chart is estimated using charted depth and tidal information
4. Conduct a short inshore passage	<ul style="list-style-type: none"> a. Observations of sea and weather are appropriate to the planned voyage b. Navigational hazards are identified c. Lights, buoyage and coastal features are used to pilot vessel throughout planned voyage d. Vessel's position is fixed and course steered is monitored to ensure safe passage e. Alternations to course and speed are appropriate to prevailing circumstances and conditions and do not put at risk the safety of the vessel, passengers or crew. f. Operational limits of vessel's propulsion, steering, power systems, trim and stability are not exceeded during navigational manoeuvres.

Range Of Variables

PLAN AND NAVIGATE A SHORT VOYAGE WITHIN INSHORE LIMITS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in accordance with the relevant maritime regulations. b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs in relation to specified quality standards. It involves the interpretation of meteorological, observations, reports and instrument measurements to the forecasting of weather and ocean conditions and the application of those forecasts to safe passage planning and navigation. c. Some discretion and judgement is required in interpreting meteorological data and forecasts, related navigational hazards and contingencies and the actions to be taken in these eventualities.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel less than 12 metres in length engaged on an inshore passage. b. Voyages to be planned and conducted may include: <ul style="list-style-type: none"> b.1. any inshore voyage navigable by the size and type of small vessel concerned b.2. passages through <ul style="list-style-type: none"> b.2.1. traffic separation schemes in inshore areas b.2.2. tidal restricted areas b.2.3. VTS controlled areas c. Navigation may occur in conditions of: <ul style="list-style-type: none"> c.1. clear visibility using visual navigational techniques c.2. restricted visibility using parallel indexing and/or electronic chart systems c.3. clear visibility using a combination of visual and electronic techniques d. Instrumentation and equipment used for navigation and fixing a small vessel's position may include: <ul style="list-style-type: none"> d.1. RADAR d.2. GPS satellite navigation systems d.3. integrated navigation systems d.4. magnetic compasses d.5. gyro compasses and repeaters d.6. chronometers and sextants d.7. azimuth mirrors and vanes d.8. pelorus d.9. doppler and electromagnetic logs d.10. depth sounders e. The use of navigational aids to assist safe navigation may include: <ul style="list-style-type: none"> e.1. avoidance of collision with another vessel e.2. fixing the position of the small vessel e.3. tracking of other ships e.4. assistance in making of command navigational decisions e.5. navigating during search and rescue operations f. Position fixing techniques may include: <ul style="list-style-type: none"> f.1. visual <ul style="list-style-type: none"> f.1.1. landmarks f.1.2. aids to navigation such as lighthouses, beacons and bouys f.2. dead reckoning, taking into account winds tides currents and estimated speed f.3. RADAR f.4. continuous position monitoring
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts of near coastal waters a.3. meteorological and oceanographic publications a.4. coastal weather reports, charts and satellite images a.5. annual and weekly notices to mariners a.6. publications from the Australian Hydrographer including radio signals, light lists, sailing directions, tide tables and chart catalogues a.7. navigational warning records a.8. NSCV/Australian USL Code a.9. vessel's log a.10. company procedures a.11. vessel manufacturer's instructions and recommended procedures a.12. instructions of relevant Maritime Authorities

Range Of Variables

PLAN AND NAVIGATE A SHORT VOYAGE WITHIN INSHORE LIMITS

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Applicable procedures and codes may include a.1. relevant sections of the NSCV/Australian USL Code a.2. regulations for preventing collisions at sea a.3. SOLAS Convention a.4. relevant international, Australian and State/Territory OH&S legislation a.5. Guidelines and Criteria for Ship Reporting Systems

Evidence Guide

PLAN AND NAVIGATE A SHORT VOYAGE WITHIN INSHORE LIMITS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan the inshore passage of a small vessel less than 12 metres in length a.2. Fix the position of a small vessel within inshore waters using all acceptable methods a.3. Identify typical navigational hazards and make due allowance for them when planning an inshore voyage a.4. Conduct the passage of a small vessel less than 12 metres in length on an inshore voyage, taking into account all relevant navigational hazards a.5. Access, use and maintain coastal navigational charts, nautical publications and related documentation a.6. Communicate effectively with others planning an inshore voyage and conducting navigation a.7. Follow reporting procedures in accordance with the relevant maritime regulations a.8. Understand the operational and navigational safety consequences of estimating bearing and courses without compass error information
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master of a small commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Principles and procedures of navigation and inshore passage planning including contingency planning c. Information required to develop a typical effective inshore passage plan d. Procedures for filing and handling navigational charts, nautical publications and related documentation in serviceable condition e. Principles and procedures for fixing a small vessel's position f. Procedures for converting one set of coordinates to another g. Procedures for the calculation of the height of tide for a given time at any place listed using tide tables h. Procedures for the use of Nautical Almanac data and information when planning and conducting an inshore voyage, including calculation of errors due to common navigational approximations i. Errors in common position fixing systems and their effect on observed positions j. Methods for controlling small vessel speed and direction k. Typical manoeuvring and engine characteristics for small vessels less than 12 metres in length on inshore voyages, including stopping distances and turning circles at various draughts, speeds and loading l. Effects on shiphandling of wind, currents and bottom topography m. Voyage planning and position fixing problems that may be experienced for small vessels on inshore voyages and appropriate action and solutions n. Manoeuvring procedures in and near 'traffic separation schemes' and 'vessel traffic service areas' o. Small vessel reporting systems p. Basic understanding to correct a magnetic compass direction/reading for variation and deviation
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. plan a simulated inshore passage and conduct navigation using an appropriate marine simulator in simulated coastal areas and across an appropriate range of navigational hazards; and/or a.2. assist in the planning and conduct of an actual passage for a for a small commercial vessel less than 12 metres in length engaged in an inshore voyage

Evidence Guide (continued)

PLAN AND NAVIGATE A SHORT VOYAGE WITHIN INSHORE LIMITS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. observing weather and ocean conditions a.2. using shipboard instruments to collect basic meteorological and oceanographic data a.3. obtaining and deciphering weather and oceanographic data collected from observations, charts, reports, satellite images and instruments a.4. forecasting weather and ocean conditions and applying the forecasts to the planning and conduct of a near coastal passage a.5. identifying and evaluating weather forecasting problems and determining appropriate solutions <p>b. Shows evidence of application of relevant workplace and regulatory procedures including:</p> <ul style="list-style-type: none"> b.1. relevant regulations b.2. established procedures for the forecasting local weather and ocean conditions in near coastal waters b.3. navigational regulations and hazard prevention policies and procedures b.4. reporting of vessel's position, route and navigational contingencies b.5. job procedures and instructions on the use of meteorological instruments, reports and observations b.6. use of relevant meteorological publications, charts and satellite images b.7. procedures for the storage and maintenance of meteorological publications and charts <p>c. Action is taken promptly to report and take account of adverse weather forecasts in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	1	1	2	2

TDMMH1302A APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL

Field MH Navigation

DESCRIPTION:

This unit involves the skills and knowledge required to predict meteorological and ocean conditions and apply them to ensure the safe navigation of a small domestic commercial vessel, including deciphering and applying information obtained from observations, reports and instruments, reliably and accurately calculating tides in accordance with official tide charts and forecasting weather for an intended near coastal voyage using all available data.

The unit is consistent with the relevant functional standard in the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Obtain and decipher weather and oceanographic information</p>	<ul style="list-style-type: none"> a. Ocean and weather conditions are observed and correctly interpreted in accordance with established nautical and meteorological practice b. Basic measurements of meteorological parameters are correctly made and recorded using established procedures c. Relevant meteorological charts, publications and related documentation are updated, stored and maintained d. Relevant navigational charts, nautical publications and related documentation are used for voyage planning and identification of navigational hazards in accordance with established procedures
<p>2. Apply weather and oceanographic data to safe navigation</p>	<ul style="list-style-type: none"> a. Weather and ocean condition hazards relevant to a proposed coastal voyage are identified using relevant forecasts based on interpretation of meteorological observations, reports and measurements b. The route for a voyage is modified as required to take into account weather and sea condition hazards in accordance with established navigational practice and operational instructions
<p>3. Maintain records of weather and oceanographic information and forecasts</p>	<ul style="list-style-type: none"> a. Meteorological measurements, observations, reports and forecasts are recorded and filed in accordance with company procedures and regulatory requirements

Range Of Variables

APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in accordance with the relevant maritime regulations b. Work is performed within a defined range of operations and routine procedures, with responsibility for own outputs in relation to specified quality standards. It involves the interpretation of meteorological, observations, reports and instrument measurements to the forecasting of weather and ocean conditions and the application of those forecasts to safe navigation c. Some discretion and judgement is required in interpreting meteorological data and forecasts, related navigational hazards and contingencies and the actions to be taken in these eventualities
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel engaged on near coastal voyages b. Voyages being planned and conducted may include: <ul style="list-style-type: none"> b.1. any near coastal voyage navigable by the size and type of vessel concerned b.2. passages through <ul style="list-style-type: none"> b.2.1. traffic separation schemes in near coastal areas b.2.2. tidal restricted areas b.2.3. VTS controlled areas b.2.4. pilotage water under conditions of restricted visibility c. Navigation may occur in conditions of: <ul style="list-style-type: none"> c.1. clear visibility using visual navigational techniques c.2. restricted visibility using parallel indexing and/or electronic chart systems c.3. clear visibility using a combination of visual and electronic techniques d. Instruments may include: <ul style="list-style-type: none"> d.1. air and sea thermometers d.2. barometers d.3. hydrometers d.4. anemometers d.5. wind strength and direction instruments d.6. instruments for measuring sea swell height, direction and period e. Meteorological and oceanographic parameters may include: <ul style="list-style-type: none"> e.1. atmospheric pressure e.2. pressure gradient e.3. air temperature e.4. relative humidity e.5. wind strength e.6. wind direction e.7. swell height, direction and period e.8. visibility e.9. cloud cover
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. operational orders a.2. navigational charts of near coastal waters a.3. meteorological and oceanographic publications a.4. coastal weather reports, charts and satellite images a.5. annual and weekly notices to mariners a.6. publications from the Australian Hydrographer including radio signals, light lists, sailing directions, tide tables and chart catalogues a.7. navigational warning records a.8. NSCV/Australian USL Code a.9. vessel's log a.10. company procedures a.11. vessel manufacturer's instructions and recommended procedures a.12. instructions of relevant Maritime Authorities
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. Sections of the NSCV/Australian USL Code related to weather forecasting and navigation a.2. AMSA Marine Orders related to weather forecasting and navigation (where applicable) a.3. International Regulations for Preventing Collisions at Sea a.4. relevant Guidelines and Criteria for Ship Reporting Systems

Evidence Guide

APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Obtain and decipher weather and oceanographic data collected from observations, reports, charts, satellite images and instruments a.2. Identify and evaluate weather forecasting problems and determine appropriate solutions a.3. Access, use and maintain meteorological charts, meteorological publications and related weather and oceanographical documentation a.4. Use weather forecasts to ensure safe navigation
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a master of a small commercial vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant regulations dealing with weather forecasting and navigation applicable for vessels on near coastal voyages b. Principles and procedures of weather forecasting using information obtained from observations, reports and instruments including: <ul style="list-style-type: none"> b.1. vertical division of the atmosphere b.2. air masses and fronts b.3. cloud classifications b.4. heat exchange process b.5. synoptic chart analysis b.6. pressure systems, cold and warm fronts b.7. cyclones, storms and gales b.8. tropical meteorology b.9. ocean currents b.10. weather data provided by shipboard instruments b.11. sea state b.12. tide prediction b.13. use of tide tables c. Basic principles and procedures for making meteorological and oceanographic measurements using appropriate instruments and interpreting and deciphering the results d. Sources of weather and oceanographic reports and methods for their interpretation e. Procedures for the application of forecast of likely weather and oceanic conditions to the development of a typical coastal passage plan f. Procedures for the calculation of height and time of low and high water at locations listed in the tide tables g. Effects on navigation and shiphandling of wind, currents and bottom topography h. Problems in the forecasting of weather and oceanographic information to navigation of a vessel and appropriate action and solutions i. Procedures to be followed during gale conditions and cyclones including the means of securing a vessel in a cyclone mooring j. Maritime communication techniques
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a range of suitably simulated practical and knowledge assignments and exercises that demonstrate the ability to collect appropriate weather and oceanographic data from observations, reports and basic measurements using shipboard instruments and apply them to the safe navigation of a vessel, and/or a.2. collect weather and oceanographic data from observations, reports and basic measurements and apply them to the safe navigation of an operational commercial or training vessel on a near coastal voyage

Evidence Guide (continued)

APPLY WEATHER INFORMATION WHEN NAVIGATING A SMALL VESSEL

5. Consistency in performance	<ul style="list-style-type: none"> a. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> a.1. observing weather and ocean conditions a.2. using shipboard instruments to collect basic meteorological and oceanographic data a.3. obtaining and deciphering weather and oceanographic data collected from observations, charts, reports, satellite images and instruments a.4. applying the forecasts to the planning and conduct of a near coastal passage a.5. identifying and evaluating weather forecasting problems and determining appropriate solutions b. Shows evidence of application of relevant workplace and regulatory procedures including: <ul style="list-style-type: none"> b.1. relevant regulations b.2. established procedures for the forecasting local weather and ocean conditions in near coastal waters b.3. navigational regulations and hazard prevention policies and procedures b.4. reporting of vessel's position, route and navigational contingencies b.5. job procedures and instructions on the use of meteorological instruments, reports and observations b.6. use of relevant meteorological publications, charts and satellite images b.7. procedures for the storage and maintenance of meteorological publications and charts c. Action is taken promptly to report and take account of adverse weather forecasts in accordance with established procedures d. Work is completed systematically with required attention to detail
6. Context for assessment	<ul style="list-style-type: none"> a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	1	1	1	2	2

TDMMR5402A CARRY OUT REFUELING AND FUEL TRANSFER OPERATIONS

Field MF Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the skills and knowledge required to supervise or carry out routine refuelling and fuel transfer operations as applied to commercial vessels in the range of 10 to 35m as the vessel's chief engineer. The commercial vessel should be considered as operating within the coastal environment and include the transfer of fuel from one vessel to another while at sea.

The unit is consistent with the relevant functional standard in the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Plan refuelling or fuel transfer operation	<ul style="list-style-type: none"> a. Refuelling and fuel transfer planning activities are carried out in accordance with established procedures b. The amount and positioning of the fuel on board the receiving vessel are calculated using established methods c. The impacts of refuelling on stability and the safety of the vessel d. Appropriate action is taken to ensure that all required safety equipment is available including emergency response stores
2. Prepare vessel for refuelling or fuel transfer operations	<ul style="list-style-type: none"> a. Pre-refuelling or fuel transfer activities are carried out in accordance with established procedures b. Appropriate action is taken to ensure that all persons involved with refuelling or fuel transfer have been properly briefed as to their function and responsibility c. Spill prevention systems are correctly deployed in accordance with established procedures and regulatory requirements d. A safety boundary for the refuelling process is established in accordance with established procedures and regulatory requirements e. Appropriate action is taken to ensure that all equipment required for an emergency response is immediately available f. Appropriate action is taken to ensure that all port authority and pollution regulations both (local and state) are being adhered to g. Appropriate action is taken to ensure that communication channels are open and ready for access h. Appropriate action is taken to ensure that emergency response training and awareness has been completed
3. Carry out refuelling or fuel transfer in commercial vessels	<ul style="list-style-type: none"> a. Refuelling or fuel transfer process is carried out in accordance with established procedures b. Appropriate action is taken to ensure that communications are maintained between all persons involved in the refuelling or fuel transfer operation c. The safety boundary is maintained for the full duration of the operation
4. Respond to emergency situation	<ul style="list-style-type: none"> a. An appropriate response is made to an emergency situation in accordance with established emergency and practiced procedures. b. Safety zone is closed off and isolated in accordance with emergency procedures and regulatory requirements c. All persons within the safety zone are correctly notified and their activities managed to ensure safety in accordance with emergency procedures and regulatory requirements d. Appropriate authorities are notified and actions taken as directed in accordance with emergency procedures and regulatory requirements

Range Of Variables

CARRY OUT REFUELING AND FUEL TRANSFER OPERATIONS

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with relevant maritime regulatory requirements b. Work is performed as the engineer accountable and responsible for self in achieving the prescribed outcomes. It involves the application of established procedures and techniques to the refuelling or fuel transfer tasks
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any commercial vessel operating within the state jurisdictions b. Refuelling or fuel transfer tasks may include: <ul style="list-style-type: none"> b.1. carrying out pre-refuelling activities b.2. generating a checklist for refuelling activities b.3. routine refuelling activities b.4. containment of spills b.5. emergency response b.6. carrying out post-refuelling activities c. Operational hazards for refuelling or fuel transfer operations may include: <ul style="list-style-type: none"> c.1. sources of ignition leading to explosion and fire c.2. electrostatic generation leading to discharge c.3. environmental hazards to air and water c.4. spills or release of vapours and gases, involving skin contact and inhalation c.5. working in emergent situations within confined spaces
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. safety management system plans, procedures, checklists and instructions a.2. vessel and company procedures
4. Applicable International, Australian and State/Territory regulations and legislation	<ul style="list-style-type: none"> a. Applicable regulations and legislation may include: <ul style="list-style-type: none"> a.1. relevant sections of IMO STCW 95 Code and Convention a.2. relevant sections of AMSA Marine Orders a.3. relevant sections of NSCV/Australian USL Code a.4. ISM Code a.5. relevant international, Australian and State/Territory maritime and OH&S legislation

Evidence Guide

CARRY OUT REFUELLING AND FUEL TRANSFER OPERATIONS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Plan for and apply all required safety, environmental and hazard control precautions and procedures during refuelling and fuel transfer operations a.2. Communicate effectively with others involved with refuelling and fuel transfer operations a.3. React appropriately to changed conditions during a refuelling and fuel transfer operation
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of a chief engineer of a 10 – 35m commercial coastal vessel.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant OH&S and pollution control legislation and policies b. Refuelling and fuel transfer procedures applying to and between 10 – 35m commercial coastal vessel c. Functions and responsibilities of crew members during refuelling and fuel transfer operations d. Hazards and related safety precautions to be observed during refuelling and fuel transfer operations e. Key information related to special hazards, precautions and related procedures applicable during refuelling or fuel transfer, including: <ul style="list-style-type: none"> e.1. tank layouts and valve and pipe systems e.2. physical properties of fuels, gases e.3. causes of explosions and related preventative measures e.4. safety, environmental, and hazards associated refuelling and fuel transfer and related hazard control methods e.5. procedures and policies for the use of personal protection clothing and equipment (PPE) e.6. procedures for the use of escape/evacuation equipment e.7. procedures for the prevention of air and water pollution e.8. procedures to be taken in the event of an accidental fuel spillage f. Basic environmental protection measures to be applied during refuelling or fuel transfer operations g. Communication techniques and equipment used during refuelling or fuel transfer operations
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. demonstrate the ability to supervise refuelling and fuel transfer operations on board a vessel and between vessels through appropriate case studies, practical exercises and simulated situations; and/or a.2. supervise refuelling and fuel transfer operations onboard an operational commercial or training vessel

Evidence Guide (continued)

CARRY OUT REFUELLING AND FUEL TRANSFER OPERATIONS

<p>5. Consistency in performance</p>	<p>a. Applies underpinning knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. carrying out vessel refuelling from a variety of sources such as wharf tanks, bunker barges, road tanker and mother vessels a.2. transferring fuel within the vessel a.3. transferring fuel from one vessel to another a.4. exercising all required safety, environmental and hazard control precautions and procedures refuelling and fuel transfer operations a.5. communicating effectively with others during refuelling and fuel transfer operations <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. ISM Code and associated vessel's Safety Management System and procedures b.2. OHS regulations and hazard prevention policies and procedures b.3. job procedures and work instructions <p>c. Action taken promptly to react to operational incidents and problems in accordance with established procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	2

TDMMR5502A PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A SMALL DOMESTIC VESSEL

Field R Carry Out Operations on Equipment and Systems

DESCRIPTION:

This unit involves the seamanship skills, knowledge and techniques required when performing routine rigging operations and using associated equipment on a domestic commercial vessel under 24m in length in accordance with safe working practices.

ELEMENT	PERFORMANCE CRITERIA
1. Use and maintain ropes and wire	<ul style="list-style-type: none"> a. Knots, hitches and bends using fibre and synthetic ropes are correctly made and used in the course of deck operations onboard a commercial vessel b. Eye splices and short splices are made in fibre and synthetic rope in accordance with established nautical practice c. Rope, wire and cables are used and maintained in accordance with company procedures and manufacturer's instructions
2. Operate lifting gear	<ul style="list-style-type: none"> a. Lifting gear is checked and prepared for operation prior to use b. Defective lifting gear is identified and isolated, reported and maintained in accordance with shipboard practices and recognised standards c. Loads are correctly rigged using appropriate ropes and rigging gear in accordance with procedures and safety requirements d. Maximum load limits as determined by design limitations and the Master are not exceeded when lifting equipment and loads using ropes, chains and rigging in accordance with shipboard procedures e. Lifting gear is safely operated to carry out deck operations in accordance with requirements and manufacturer's instructions
3. Perform tasks aloft and over ship's side	<ul style="list-style-type: none"> a. Site and equipment for working aloft are prepared in accordance with shipboard practices and recognised standards b. Required precautions are taken when working aloft or over the side c. Chairs, stages, safety harnesses and appropriate safety equipment is used in accordance with shipboard practices and recognised standards d. Portable ladders are correctly used and maintained e. Equipment used when working aloft is correctly maintained and stored
4. Lash and secure cargo and access ways to a small vessel	<ul style="list-style-type: none"> a. Lashing equipment is inspected and maintained in accordance with shipboard practices and recognised standards b. Faulty lashing equipment is identified and isolated, reported and maintained in accordance with shipboard practices and recognised standards c. Cargo is lashed and secured in accordance with shipboard practices and recognised standards d. Appropriate consideration is given to the effects of ship's motion on stowed cargo when lashing cargo e. Lashing equipment used is correctly stored after use f. Personnel access ways are rigged and secured in accordance with shipboard practices and recognised standards

Range Of Variables

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A SMALL DOMESTIC VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with the relevant regulations b. Work is performed within defined operational procedures, with responsibility for own outputs in relation to specified quality standards. It involves performing routine rigging operations and using associated equipment in accordance with safe working practices
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian domestic commercial vessel under 24m in length b. Rigging operations may be carried out: <ul style="list-style-type: none"> b.1. by day or night in normal operational situations b.2. under normal and adverse conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. when berthed b.7. adverse weather conditions c. Rigging operations may include: <ul style="list-style-type: none"> c.1. using and maintaining ropes, wires and chains c.2. splicing natural fibre and synthetic ropes c.3. checking and using lifting equipment, ropes, chains and rigging gear when lifting loads c.4. lashing cargo c.5. securing gangways, brows and ladders for safe access d. Knots and splices may include: <ul style="list-style-type: none"> d.1. Figure of eight d.2. Reef knot d.3. Clove hitch d.4. Rolling hitch d.5. Sheet bend, d.6. sheep shank d.7. bowline on the bite d.8. carrick bend d.9. marline spike hitch d.10. eye splice d.11. short splice d.12. common whipping d.13. west country whipping d.14. sail makers whipping d.15. common seizing d.16. racking seizing e. Personnel access equipment may include: <ul style="list-style-type: none"> e.1. gangways e.2. brows e.3. ladders f. Lifting gear may include: <ul style="list-style-type: none"> f.1. cranes f.2. derricks f.3. winches f.4. hoists f.5. grabs f.6. spreaders f.7. trawl booms f.8. pot/trap winches

Range Of Variables (continued)

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A SMALL DOMESTIC VESSEL

VARIABLE	SCOPE
<p>2. Worksite environment (continued)</p>	<p>g. Lifting gear components may include:</p> <ul style="list-style-type: none"> g.1. shackles g.2. hooks g.3. slings g.4. blocks g.5. tackles g.6. hoists g.7. eyebolts g.8. beam clamps g.9. trolleys g.10. pot/trap lines g.11. long lines g.12. set lines g.13. trawl wires g.14. chains <p>h. Equipment for working aloft and over the side may include:</p> <ul style="list-style-type: none"> h.1. gantlines h.2. Bosun' chair h.3. safety harnesses h.4. stage <p>i. Cargo to be lashed may include:</p> <ul style="list-style-type: none"> i.1. general cargo i.2. containers i.3. RO-RO vehicles i.4. timber deck cargo i.5. fish and fishing gear
<p>3. Sources of information/ documents</p>	<p>a. Sources of information and documentation may include:</p> <ul style="list-style-type: none"> a.1. Safety Management System procedures a.2. shipboard rigging procedures a.3. OH&S regulations a.4. manufacturer's instructions and recommended procedures a.5. relevant Australian and international standards and regulations a.6. Cargo securing manual
<p>4. Applicable International, Australian and State/Territory regulations and legislation</p>	<p>a. Applicable regulations and legislation may include:</p> <ul style="list-style-type: none"> a.1. Safety Management System a.2. relevant international, Australian and State/Territory OH&S legislation

Evidence Guide

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A SMALL DOMESTIC VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Use and maintain ropes and wire a.2. Operate lifting gear a.3. Rig and maintain personnel access ways a.4. Perform tasks aloft and over ship's side a.5. Lash and secure cargo a.6. assist with rigging and lashing machinery components a.7. Exercise all required safety and hazard control procedures when carrying out rigging operations a.8. Communicate effectively with others during rigging operations
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency must be assessed in conjunction with other mandatory units that form part of a job role of an integrated rating</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Knowledge of relevant maritime regulations b. Relevant OH&S legislation and policies c. Types of knots, bends and hitches in common use, their characteristics, applications and limitations, and methods of tying them using synthetic and fibre rope of varying construction and size d. Procedures for splicing synthetic fibre rope e. Breaking strain and safe working load for ropes and equipment f. Principles of rope deterioration and care and maintenance requirements for different types of rope and wire g. Principles and limitations of lifting equipment and components h. Procedures for checking and operating lifting equipment including slinging of loads and various lifting fittings and arrangements i. Precautions and procedures for working aloft and over the side j. Maintenance and storage procedures for equipment used when working aloft or over the side k. Procedures for rigging and preparing personnel access ways l. Principles and procedures for the lashing and securing of cargo including the inspection and maintenance requirements for lashing equipment m. Maritime communication techniques
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1. participate in a suitable range of appropriately-simulated rigging, lifting and cargo lashing exercises, situations and case studies and associated resources; and/or a.2. assist with rigging, lifting and cargo lashing operations on a working vessel

Evidence Guide (continued)

PERFORM RIGGING AND LIFTING OPERATIONS ON BOARD A SMALL DOMESTIC VESSEL

<p>5. Consistency in performance</p>	<p>a. Applies underpinning seamanship knowledge and skills when:</p> <ul style="list-style-type: none"> a.1. using and maintaining ropes and wire a.2. operating lifting gear a.3. rigging fishing gear a.4. performing tasks aloft and over ship's side a.5. lashing and securing cargo a.6. applying safety precautions during rigging operations <p>b. Shows evidence of application of relevant workplace procedures including:</p> <ul style="list-style-type: none"> b.1. relevant sections of marine regulation b.2. Safety Management System procedures b.3. OHS regulations and hazard prevention policies and procedures b.4. job procedures and work instructions b.5. relevant manufacturer's guidelines relating to the use of ropes, wires, cables, anchors, deck equipment and machinery, including instructions on equipment capability and limitations b.6. on-board housekeeping processes <p>c. Action taken promptly to report and/or rectify accidents, safety incidents and operational problems in accordance with regulations and procedures</p> <p>d. Work is completed systematically with required attention to detail</p>
<p>6. Context for assessment</p>	<p>a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations</p> <p>b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ul style="list-style-type: none"> b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations b.2. Appropriate practical assessment must occur: <ul style="list-style-type: none"> b.2.1. at the registered training organisation, and/or b.2.2. on an appropriate working or training vessel

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	2	1	1	2

**TDMMU502A ENSURE COMPLIANCE WITH ENVIRONMENTAL CONSIDERATIONS
IN A SMALL DOMESTIC VESSEL**

Field U Environment

DESCRIPTION:

This unit involves the skills and knowledge required to operate a small domestic vessel in compliance with domestic regulations and sound environmental practices. It is designed for masters and engineers of vessels up to 24 metres in length.

The unit is consistent with the related functional standard in Table A II/2 and AIII/1 of the STCW 95 Code, AMSA Marine Orders Part 3, Issue 5, Appendix 2 and Appendix 3, and relevant sections of the NSCV/Australian USL Code.

ELEMENT	PERFORMANCE CRITERIA
1. Apply relevant domestic legislative requirements and international requirements	<ul style="list-style-type: none"> a. Relevant domestic legislative and administrative requirements are identified, understood and applied to vessel operations b. Basic need for management of environmental issues is identified, understood and addressed during vessel operations c. Implications and concerns on environmental issues other than those managed by Marine Safety authorities are identified and interpreted, and appropriate action is taken in respect of vessel operations
2. Apply principles for preventing oil pollution and for responding to pollution incidents	<ul style="list-style-type: none"> a. Generic precautions for preventing spillage of oil through refuelling bilge pumping transfer of fuel, maintenance, loss of deck cargo, loss of vessel are understood and applied during vessel operations b. Generic responses to spilled fuel are understood and applied during vessel operations and pollution incidents c. Requirements for the responsible disposal of waste oil are understood and applied during vessel operations and maintenance
3. Apply requirements for management of garbage	<ul style="list-style-type: none"> a. The rules of disposal of garbage are understood and applied during vessel operations b. A garbage record book is maintained in accordance with regulatory requirements and workplace procedures c. Principles of responsible management of garbage are applied during vessel operations
4. Apply basic principles of ballast water management	<ul style="list-style-type: none"> a. Basic reasoning and principles for ballast water control are understood and applied during vessel operations
5. Apply the principles of management of sewage discharges	<ul style="list-style-type: none"> a. Basic reasoning and principles for sewage control are applied during vessel operations b. Responsible management of sewage is demonstrated during vessel operations
6. Apply environmental and safety principles during the stowage and management of explosive and flammable material	<ul style="list-style-type: none"> a. Environmental and safety principles and regulatory requirements are applied during stowage and management of flammable/explosive liquids, gases, solids and other materials normally carried on board b. Dangers inherent with the above materials are understood and appropriate precautions are taken in accordance with regulatory requirements and workplace procedures

Range Of Variables

ENSURE COMPLIANCE WITH ENVIRONMENTAL CONSIDERATIONS IN A SMALL DOMESTIC VESSEL

VARIABLE	SCOPE
1. General context	<ul style="list-style-type: none"> a. Work must be carried out in compliance with mandatory rules and regulations concerning protection of the marine environment. b. Work is performed relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes. It involves the application of regulations and measures to ensure the protection of the marine environment in a wide variety of operational contexts.
2. Worksite environment	<ul style="list-style-type: none"> a. Vessel may include any Australian or international commercial vessel b. Dangers to the marine environment may occur: <ul style="list-style-type: none"> b.1. by day or night in both normal and emergency situations b.2. under any possible conditions of sea and weather b.3. while underway b.4. during berthing and unberthing operations b.5. while anchoring or mooring b.6. while moored or at anchor b.7. during loading and unloading operations b.8. during maintenance operations c. Items and equipment which may be checked as part of anti-pollution measures include: <ul style="list-style-type: none"> c.1. pumps c.2. valves c.3. emission control equipment c.4. water management equipment including: cooling water, ballast water and bilge systems c.5. waste storage and recycling equipment c.6. ballast management equipment d. Preventative measures to protect the marine environment may include: <ul style="list-style-type: none"> d.1. prevention of spillages of cargo d.2. prevention of spillages of fuel and oil d.3. control of polluting emissions of gas and smoke d.4. effective management of waste, pollution and recycling processes d.5. effective management of ballast operations d.6. shipboard housekeeping d.7. pollution control instructions e. Environmental issues other than those managed by Marine Safety authorities may include but are not restricted to: <ul style="list-style-type: none"> e.1. fishing restrictions e.2. damage to sensitive environments through anchoring e.3. laying pots/traps/moorings e.4. noise f. Flammable/explosive liquids, gases, solids and other hazardous materials normally carried on board a vessel may include but are not restricted to: <ul style="list-style-type: none"> f.1. spare fuel f.2. lubricants f.3. LPG cooking gas f.4. flares f.5. cleaning products
3. Sources of information/ documents	<ul style="list-style-type: none"> a. Sources of information and documentation may include: <ul style="list-style-type: none"> a.1. operational orders a.2. relevant regulations for the type of vessel involved a.3. company procedures related to the protection of the marine environment a.4. equipment manufacturer's instructions and recommended procedures a.5. instructions of relevant Maritime Authorities a.6. vessel's log where relevant a.7. certificates and other documents required by regulations for the protection of the marine environment a.8. relevant standards related to the protection of the marine environment

Range Of Variables

ENSURE COMPLIANCE WITH ENVIRONMENTAL CONSIDERATIONS IN A SMALL DOMESTIC VESSEL

VARIABLE	SCOPE
4. Applicable International, Australian and State/Territory regulations and legislation	a. Dependent on the type, size and range of service of the vessel, applicable regulations and legislation may include: <ul style="list-style-type: none">a.1. IMO STCW 95 Code and Convention related to protection of the marine environmenta.2. relevant sections of AMSA Marine Orders related to protection of the marine environmenta.3. the NSCV/Australian USL Code related to protection of the marine environmenta.4. MARPOL Conventiona.5. relevant international, Australian and/or State/Territory legislation related to protection of the marine environmenta.6. the National Plan to Combat the Pollution of the Sea by Oil

Evidence Guide

ENSURE COMPLIANCE WITH ENVIRONMENTAL CONSIDERATIONS IN A SMALL DOMESTIC VESSEL

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none"> a.1. Maintain compliance with legislative requirements for protection of the marine environment a.2. Implement preventative and remedial anti-pollution procedures as per relevant regulations and procedures a.3. Identify typical pollution control problems and take appropriate action a.4. Maintain all records concerning anti-pollution measures and breaches of anti-pollution regulations a.5. Communicate effectively with others concerning measures to protect the marine environment
<p>2. Interdependent assessment of units</p>	<p>a. This unit of competency may be assessed in conjunction with other units that form part of a job role of a master, engineer or marine engine driver on a commercial vessel with responsibilities for ensuring compliance with pollution control measures.</p>
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Relevant legislation, codes of practice, policies and procedures to protect the marine environment b. Effects on the marine environment of various possible pollution incidents c. Pollution control problems and related measures to protect the marine environment d. Certificates and other documents required by relevant Australian and/or international legislation and conventions for the protection of the marine environment e. Operational characteristics of emission control equipment typically used on various types and sizes of vessels f. Operational requirements of water, bilge, waste, pollution and recycling management processes used on various types and sizes of vessels g. Requirements under Australian and/or international legislation and conventions for reporting incidents related to breaches of the statutory codes and measures for the protection of the marine environment h. Safety implications of the carriage and stowage of flammable or hazardous material in a small vessel
<p>4. Resource implications</p>	<p>a. Access is required to opportunities to either:</p> <ul style="list-style-type: none"> a.1 demonstrate performance in suitably-simulated activities aimed at the protection of the marine environment covering an appropriate range of situations experienced on a vessel and/or a.2 contribute to measures to protect the marine environment on a vessel in an appropriate range of situations, weather and loading conditions
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> b. Applies underpinning knowledge and skills when: <ul style="list-style-type: none"> b.1 completing activities aimed at compliance with relevant regulatory requirements for protection of the marine environment b.2 identifying and evaluating problems related to compliance with relevant regulations for environmental protection and determining an appropriate courses of action b.3 following anti-pollution procedures b.4 assessing compliance of vessel with relevant regulatory requirements for protection of the marine environment b.5 stowing flammable or hazardous materials onboard c. Shows evidence of application of relevant workplace procedures including: <ul style="list-style-type: none"> c.1 relevant regulatory requirements dealing with environmental protection c.2 OHS regulations and hazard prevention policies and procedures c.3 job procedures and work instructions related to environmental protection c.4 on-board housekeeping processes c.5 waste, pollution and recycling management processes, where relevant d. Action is taken promptly to report and/or rectify breaches of environmental protection regulations e. Work is completed systematically with required attention to detail

Evidence Guide (continued)

ENSURE COMPLIANCE WITH ENVIRONMENTAL CONSIDERATIONS IN A SMALL DOMESTIC VESSEL

6. Context for assessment
- a. Assessment of competence must comply with the assessment requirements of the relevant maritime regulations
 - b. Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:
 - b.1. As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations
 - b.2. Appropriate practical assessment must occur:
 - b.2.1. at the registered training organisation, and/or
 - b.2.2. on an appropriate working or training vessel

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	2	1	2	1	2	2