



Australian Government

Department of Education, Employment and Workplace Relations

UEPOPS248B Operate and monitor an internal combustion dual fuel reciprocating engine

Release: 1

UEPOPS248B Operate and monitor an internal combustion dual fuel reciprocating engine

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit deals with the skills and knowledge required to operate, inspect and monitor dual fuel reciprocating engines.

Application of the Unit

Application of the Unit 2)

This unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to Occupational Health and Safety and where applicable contracts of training such as apprenticeships and the like.

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

There are no pre-requisite units.

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following levels. A description of what each level entails is provided in Section 2.3.1 Language, Literacy and Numeracy.

Reading 2 Writing 2 Numeracy 2

Employability Skills Information

Employability Skills 5)

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element.
Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan and prepare work	1.1 Safety issues are identified to comply with enterprise/site requirements
	1.2 Work requirements are identified from relevant personnel and documentation
	1.3 Documentation to determine plant status is assessed and evaluated
	1.4 Localised plant inspection and field preparation for service are carried out in accordance with manufacturer's and enterprise/site procedures
	1.5 Plant operational pre-requisites are established in accordance with manufacturer's and enterprise/site procedures
	1.6 Sequence for recommissioning of plant is determined to suit existing circumstances in accordance with enterprise/site requirements
	1.7 Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
2 Operate plant	2.1 Plant is operated in accordance with enterprise and manufacturer's operating procedures
	2.2 Plant is monitored and observed to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities in accordance with manufacturer's and enterprise/site procedures
3 Change fuel type during operation	3.1 Changeover is monitored and observed to detect deviations from expected results
	3.2 Corrective actions are taken to rectify abnormalities in accordance with manufacturer's and enterprise/ site requirements.

ELEMENT	PERFORMANCE CRITERIA
4 Test plant operation	4.1 Tests are performed in accordance with defined procedures applicable to the operational test
	4.2 Plant is observed for correct operational response
	4.3 Correct action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements
	4.4 Appropriate personnel are notified when defects are detected
5 Analyse plant faults	5.1 Cause of abnormal plant operating conditions are identified by analysing the technical and operational information in a logical and sequential manner
	5.2 Corrective action taken is in accordance with company procedures
	5.3 Plant integrity and personnel safety is maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation
6 Monitor and inspect plant	6.1 Plant to be monitored/inspected is physically identified
	6.2 Plant is monitored/inspected for normal operation or to detect deviations
	6.3 Corrective action taken is in accordance with enterprise procedures
	6.4 Appropriate personnel are notified when defects are detected
7 Complete documentation	7.1 Documentation is updated and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of operating and monitoring an internal combustion dual fuel reciprocating engine.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

The extent of the Essential Knowledge and Associated Skills required follows:

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Evidence shall show that knowledge has been acquired for safe working practices of:

T1 Relevant Environmental, Occupational Health and Safety legislation and regulations

T2 Enterprise procedures

T3 Plant drawings and manufacturers manuals

T4 Introduction to and typical arrangements of power production plant

T5 Relevant plant and equipment, its location and operating parameters

T6 Switchgear types and characteristics

T7 Electrical protection types and characteristics

T8 Plant status;

T9 Starting system, types and characteristics

T10 Fuel systems, types and characteristics

T11 Lubricating system, types and characteristics

T12 Cooling system types and characteristics

T13 Internal combustion reciprocating engine, types and characteristics

T14 Enterprise recording procedures

T15 Control and data acquisition systems

T16 Equipment starting pre-requisites

T17 Fuel changeover equipment types and characteristics

T18 Air intake and exhaust system, types and characteristics

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Specific skills needed to achieve the Performance Criteria:

T1 Interpret plant drawings and manufacturers manuals

T2 Apply relevant state and territory regulations

T3 Identify plant status

T4 Prepare plant/equipment for operation

T5 Organise resources

T6 Operate dual fuel engines

T7 Apply diagnostic and testing techniques

T8 Identify and respond to abnormal plant operating conditions

T9 Plan and prioritise work

T10 Use relevant hand tools

T11 Communicate effectively

T12 Apply data analysis techniques and tools

T13 Apply knowledge of dual fuel engine operation.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the Range Statement of the competency standard unit and the Training Package Assessment Guidelines. The Evidence Guide forms an integral part of this competency standard unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit** 9.2)

Before the critical aspects of evidence are considered all pre-requisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the “Assessment Guidelines – UEP12”. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and Range Statement
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and Range Statement
 - Demonstrate an understanding of the Essential Knowledge and Associated Skills as described in 6) Essential Knowledge and Associated Skills of this unit
 - Demonstrate an appropriate level of employability skills
 - Conduct work observing the relevant Anti-Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated performance across a representative range of contexts from the prescribed items below:
 - Knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures
 - Preparation and planning of work
 - Operation of dual fuel engines
 - Operationally testing plant
 - Analysing plant faults
 - Monitoring plant operation
 - Knowledge of fuel changeover equipment/systems and requirements

- Dealing with an unplanned event by drawing on Essential Knowledge and Skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this competency standard unit

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and application of work.

In addition to the resources listed above in Context of assessment', evidence should show competency working, in limited spaces, with different types of plant and equipment as well as different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Section 1.3.00 Assessment Guidelines .

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires that the specified Essential Knowledge and Associated Skills be assessed in a structured environment, which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the Essential Knowledge and Skills described in this unit.

**Concurrent
assessment and
relationship with
other units**

9.5)

There are no recommended concurrent assessments with this unit, however in some cases efficiencies may be gained in terms of learning and assessment effort being concurrently managed with allied competency standard units where listed.
Nil

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

Systems, plant and/or equipment may include dual fuel engines and associated auxiliaries; electrical supply switchboard(s) and transformers; fans and pumps; valves, actuators and dampers (electric, hydraulic, pneumatic and manual); supervisory, alarm, protection and control equipment; starting systems; fuel and fuel changeover systems.

Safety standards may include relevant sections of Occupational Health and Safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), local indicators and recorders, computers and alarms (visible and or audible).

Communications may be by means of telephone, two way radio, pager, public address system, computer (electronic mail) and operating log (written or verbal).

Tests may include stand-by plant tests, post maintenance operating tests and black start

Appropriate personnel to consult, give or receive direction may include supervisor/team leader or equivalent, technical and engineering officers or equivalent, power system control personnel or equivalent, contractor and specialist personnel, maintenance staff and power plant operations personnel.

Test, fault finding and operating tools may include high voltage testers, proving dead equipment, power or hand tools and control system equipment

Operating environment may be, during inclement or otherwise harsh weather conditions, wet/noisy/dusty/hot areas or during night periods.

Faults and abnormal operating conditions may include motor/pump/ actuator/valve/ dampers failure/malfunctions, control equipment failure/ malfunctions, loss of electrical supply to plant and equipment, high engine/turbocharger/lubricating oil temperatures, low lubricating oil pressure/flow and excessive vibration pumps/motors.

Medium speed diesels may have speeds below 500rpm but are engines of conventional design. The auxiliary equipment is generally remote from plant with separate energy supplies. These engines are medium to large in size and usually require platforms to conduct service and inspection. The monitoring points are at individual sections or components.

High speed diesel engines may have speeds as low as 1000rpm. These engines are of conventional design and are small and compact. The auxiliary equipment is generally integrated with, and powered by the engine. The monitoring points are usually collective and not at individual sections or components.

Generic terms are used throughout this Training Package for vocational standard shall be regarded as part of the Range Statement in which competency is demonstrated. The

RANGE STATEMENT

definition of these and other terms are given in Section 2.1 Preliminary Information and Glossaries.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Operations