



Australian Government

MARC4003A Operate auxiliary machinery systems up to 1500 kW

Release 1

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Modification History

Release 1

This is the first release of this unit.

Unit Descriptor

This unit involves the skills and knowledge required to operate auxiliary machinery systems up to 1500 kW according to technical specifications and safe operating limit.

Application of the Unit

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 1 on vessels up to 1500 kW.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

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|--|---|
| 1 Prepare for operation | <ul style="list-style-type: none">1.1 Risks to self, others and the environment are identified according to organisational procedures1.2 Routine pre-operational checks of auxiliary machinery systems are completed prior to use according to manufacturer specifications and organisational procedures |
| 2 Operate auxiliary machinery systems | <ul style="list-style-type: none">2.1 Suitable personal protective equipment is selected and used according to organisational procedures2.2 Auxiliary machinery systems are operated in a safe and controlled manner2.3 Performance of auxiliary machinery system operations are monitored2.4 Adverse sea and weather conditions that may impact on operation of auxiliary machinery systems are identified and operational practices are adjusted to maintain safety of vessel and personnel2.5 Faults or malfunctions are identified and recorded according to organisational procedures2.6 Faults or malfunctions are rectified and corrective actions are taken and recorded according to organisational procedures2.7 Procedures to be undertaken in emergencies are recognised and implemented |
| 3 Complete operations and check auxiliary machinery systems | <ul style="list-style-type: none">3.1 Shut-down procedures are conducted according to manufacturer instructions and organisational procedures3.2 Operational records are completed as required according to organisational procedures and regulatory requirements |

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required Skills:

- Maintain records of the operation and maintenance of auxiliary machinery systems and any related safety incidents
- Monitor and evaluate performance of auxiliary machinery systems
- Operate all equipment
- Read and interpret:
 - manufacturer instructions for the operation of auxiliary machinery systems
 - maritime regulations, rules and instructions
- Recognise when the performance of auxiliary machinery systems is unsatisfactory or outside specified limits and take appropriate action
- Recognise problems that may occur with auxiliary machinery systems and take appropriate preventative and remedial action

Required Knowledge:

- Alarm panels
- Auxiliary systems, materials and construction
- Causes of deck machinery faults
- Characteristics of auxiliary machinery systems
- Closing devices and remote shut offs
- Dangers associated with operating shipboard auxiliary machinery systems and related hazard prevention strategies
- Drive systems, belts, clutches and motors
- Electro-hydraulic steering gear
- Emergency operation in electrical or hydraulic failure
- Emergency shut offs and closures
- Fire detection and fire alarm systems
- Fixed firefighting installations including CO₂, foam and water mist
- Function of:
 - grease
 - lubricating oil
- Hydraulic systems including steering gear
- Identification of:
 - refrigeration system components
 - faults in refrigeration systems
- Instrumentation used

- Methods for controlling and managing operation of shipboard auxiliary machinery systems
- Operation of deck machinery
- Problems associated with auxiliary machinery systems, and appropriate preventative and remedial action and solutions
- Procedures for monitoring and evaluating performance of auxiliary machinery systems
- Pumps and pumping systems for bilge, fire, fuel oil, freshwater and seawater systems
- Refrigeration:
 - cycle
 - plant and its operation
- Relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- Relevant sections of commonwealth, state and territory maritime regulations, National Standard for Commercial Vessels (NSCV)
- Requirements for waste management and pollution control under the MARPOL Convention from auxiliary machinery systems
- Rudder and stock support bearings, glands, packing and seals
- Rudder construction and rudder types
- Safe:
 - operation practices
 - working procedures
- Safeguards and protective devices for deck machinery
- Simple hydraulic circuits
- Strainers, mud-boxes and foot valves
- Terminology of materials technology
- Types of:
 - fixed firefighting systems including gas and foam flooding systems
 - pumps and associated safety devices
 - refrigerant
- Winches and windlass

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, the required skills and knowledge, the range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the Elements, Performance Criteria, Required Skills, Required Knowledge and include:

- being aware of own ability and limits to rectify irregularities or faults
- awareness of one's surroundings and changes to these surroundings
- attention to appropriate level of detail in recordkeeping.

Context of and specific resources for assessment

Performance is demonstrated consistently over time and in a suitable range of contexts.

Resources for assessment include access to:

- industry-approved marine operations site where operating auxiliary machinery systems up to 1500 kW can be conducted
- tools, equipment and personal protective equipment currently used in industry
- relevant regulatory and equipment documentation that impacts on work activities
- range of relevant exercises, case studies and/or other simulated practical and knowledge assessments
- appropriate range of relevant operational situations in the workplace.

In both real and simulated environments, access is required to:

- relevant and appropriate materials and equipment
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals.

Method of assessment

Practical assessment must occur in an:

- appropriately simulated workplace environment and/or
- appropriate range of situations in the workplace.

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate to this unit:

- direct observation of the candidate operating auxiliary machinery systems up to 1500 kW
- direct observation of the candidate applying relevant

Guidance information for assessment

WHS/OHS requirements and work practices.

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

In all cases where practical assessment is used it should be combined with targeted questioning to assess Required Knowledge.

Assessment processes and techniques must be appropriate to the language and literacy requirements of the work being performed and the capacity of the candidate.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below.

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|---|--|
| Auxiliary machinery systems must include: | <ul style="list-style-type: none">• Cargo discharging or loading systems• Commercial refrigeration and freezer plants• Compressed air• Control air systems• Deck machinery• Hydraulics• Fire, bilge and ballast pumping systems• Fixed gas and foam firefighting systems• Fresh water generation• Fuel and lubricating oil purification systems• Sewage treatment• Steering system including rudder |
| Emergencies must include: | <ul style="list-style-type: none">• Loss of:<ul style="list-style-type: none">• control air pressure• electrical power• Failure of steering system• Hydraulic failure |
| Operational records must include: | <ul style="list-style-type: none">• Log books• Maintenance records• Plant and equipment manufacturer instructions and recommended procedures• Relevant maritime authority documentation relating to operating auxiliary machinery systems• Standard operating procedures from the organisation's safety management system |

Unit Sector(s)

Not applicable.

Competency Field

Equipment Operations