



Australian Government

MARC4006A Operate propulsion transmission systems up to 1500 kW

Release 1

MARC4006A Operate propulsion transmission systems up to 1500 kW

Modification History

Release 1

This is the first release of this unit.

Unit Descriptor

This unit involves the skills and knowledge required to operate propulsion transmission systems up to 1500 kW according to technical specifications and safe operating limits.

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

- | | |
|--|---|
| 1 Prepare for operation | <ul style="list-style-type: none">1.1 Risks to self, others and the environment are identified and precautions are taken to minimise risk according to organisational procedures1.2 Routine pre-operational checks of <i>propulsion transmission systems</i> are completed prior to use according to manufacturer specifications and organisational procedures |
| 2 Operate propulsion transmission systems | <ul style="list-style-type: none">2.1 Suitable personal protective equipment is selected and used according to organisational procedures2.2 Propulsion transmission systems are operated in a safe and controlled manner2.3 Performance of propulsion transmission system operations is monitored2.4 Faults or malfunctions are identified and recorded according to organisational procedures2.5 Faults or malfunctions are rectified and corrective actions are taken and recorded according to organisational procedures2.6 Procedures to be undertaken in <i>emergencies</i> are recognised and implemented2.7 Suitable personal protective equipment is selected and used according to organisational procedures |
| 3 Complete operations | <ul style="list-style-type: none">3.1 Shut-down procedures are conducted according to manufacturer instructions and organisational procedures3.2 <i>Operational records</i> are completed according to organisational procedures |

Required Skills and Knowledge

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

Required Skills:

- Carry out necessary calculations associated with managing propulsion transmission systems including:
 - calculating gear box ratios, theoretical distance and propeller slip
- Maintain records of operating maintaining propulsion transmission systems and any related safety incidents
- Operate emergency power transmission system
- Read and interpret:
 - manufacturer instructions for operating propulsion transmission systems
 - maritime regulations, rules and instructions
- Read and monitor various gauges and evaluate performance of propulsion transmission systems
- Recognise problems that may occur with propulsion transmission systems and take appropriate preventative and remedial action
- Recognise when performance of propulsion transmission systems is unsatisfactory or outside of specified limits and take appropriate action

Required Knowledge:

- Characteristics of propulsion transmission systems including operational limits
- Fault identification on gearbox
- Gearbox:
 - construction and materials
 - lubricating and cooling systems and components
- Methods for controlling and managing the operation of shipboard propulsion transmission systems
- Problems associated with propulsion transmission systems and appropriate preventative and remedial action and solutions
- Procedures for monitoring and evaluating performance of propulsion transmission systems
- Propeller shape, design and materials
- Propeller types and arrangements including fixed pitch and controllable pitch propellers
- Relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- Reverse and reduction gearbox construction and operation
- Shaft:
 - bearings
 - seals and glands

- Shafting materials
- Steerable/rudder propellers
- Stern and jet water drive
- Stern tube bearing systems including lubrication, materials and components
- Types of gear trains

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:

- attention to appropriate level of detail in recordkeeping
- being aware of own ability and limits to rectify irregularities and faults.

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 propulsion transmission 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 propulsion transmission systems up to 1500 kW
- direct observation of the candidate applying relevant WHS/OHS requirements and work practices

Guidance information for

Holistic assessment with other units relevant to the industry

assessment

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.

Propulsion transmission systems must include:

- Control system
- Fixed pitch and controllable pitch propellers
- Gearbox and reduction gear arrangements
- Intermediate bearings
- Propeller types and arrangements
- Shafting arrangements
- Stern tube and their systems
- Transmission system

Emergencies must include:

- Failure or major fault in:
 - propulsion transmission system or associated systems

Operational records must include:

- Log books
- Maintenance scheduling and maintenance records from organisation's safety management system
- Plant and equipment manufacturer instructions and recommended procedures

Unit Sector(s)

Not applicable.

Competency Field

Equipment Operations