



Australian Government

MARC3001A Manage fuel systems

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 manage the fuel and fuel oil systems of a vessel to ensure safety of operation and to avoid pollution of the marine environment.

Application of the Unit

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 2 on vessels up to 750 kW or as a Marine Engine Driver Steam.

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 Plan refuelling | 1.1 Fuel tanks are dipped to establish current level of fuel |
| | 1.2 Amount of fuel on board vessel is calculated and positioning of fuel |

- is determined
- 1.3 ***Impact of refuelling on vessel safety*** is determined
- 1.4 Fuel is ordered according to organisational procedures
- 2 Prepare vessel for refuelling**
- 2.1 Vessel is positioned and secured for refuelling
- 2.2 ***Refuelling equipment*** is correctly deployed according to organisational procedures
- 2.3 Communication between all people involved in refuelling procedures is established
- 2.4 Tank valves are opened as necessary and refuelling operations are performed according to organisational procedures and regulatory requirements
- 2.5 Tanks are dipped to ensure correct amount of fuel has been received
- 3 Complete refuelling operations**
- 3.1 ***Shut-down procedures*** are conducted according to organisational procedures
- 3.2 Refuelling equipment is secured according to organisational procedures
- 3.3 ***Refuelling records*** are completed according to organisational procedures and regulatory requirements
- 3.4 Malfunctions, faults, irregular performance or damage to refuelling equipment are recorded according to organisational procedures
- 4 Manage an emergency**
- 4.1 Appropriate response is made to ***emergency situation*** according to organisational procedures
- 4.2 All personnel are correctly notified and their activities are managed to ensure their safety, according to organisational procedures
- 4.3 Waste containment measures are implemented to protect the environment
- 4.4 ***Appropriate authorities*** are notified when applicable
- 4.5 Incident is recorded according to regulatory requirements and organisational procedures

Required Skills and Knowledge

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

Required Skills:

- Carry out accurate calculations dealing with bunkering capacity, consumption of fuel, speed and range of vessel
- Complete required records
- Manage refuelling to ensure safety of operation and avoid pollution of marine environment
- Measure tank levels
- Read and interpret manufacturer specifications and safety data sheets (SDS)/material safety data sheets (MSDS)
- Recognise faulty equipment and take appropriate action
- Recognise problems and hazards during refuelling and fuel transfer operations, and take appropriate action
- Select and use relevant equipment required for refuelling and fuel transfer operations
- Take appropriate action in response to an accidental spillage or safety incident during refuelling and fuel transfer operations

Required Knowledge:

- Arrangement of fuel oil systems
- Calculations involving specific fuel consumption, speed and range
- Calculations of volumes
- Condensation in fuel tanks
- Conversion of volumes to litres
- Effect of slack tanks on vessel stability
- Environmental protection measures to be applied during refuelling or transfer operations
- Fuel oil tank components
- Fuel tank filling
- Functions and responsibilities of crew during refuelling or transfer operations
- Hazards and safety precautions to be observed during refuelling or transfer operations
- Methods of fuel oil tank content measurement
- Refuelling and fuel transfer procedures applying to commercial vessels
- Specific fuel consumption
- Specific gravity
- Work health and safety (WHS)/occupational health and safety (OHS) and pollution control, legislation and policies

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:

- performing accurate and reliable calculations dealing with bunkering capacity, consumption of fuel, speed and range of vessel
- managing refuelling to ensure safety of operation and avoid pollution of marine environment
- taking appropriate action when accidental spillage or safety incident occurs during refuelling and fuel transfer operations.

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 managing the fuel systems of a vessel 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 managing the fuel systems of a vessel
- direct observation of the candidate applying relevant WHS/OHS requirements and work practices.

Guidance information for assessment

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.

Impact of refuelling on vessel safety may include:

- Ignition of released fuel vapours
- Loss of stability

Refuelling equipment may include:

- Bunding
- Bunker flag (B Flag)
- Firefighting equipment
- No smoking signs
- Scupper plugs
- Spill kit

Shut-down procedures may include:

- Communications with fuel supplier
- Valve closure

Refuelling records may include:

- Log book
- Oil record book
- Port authority documentation

Emergency situations may include:

- Fire
- Hose rupture
- Spillage

Appropriate authorities may include:

- Environmental protection authority
- Fire and emergency services
- Port authority

Unit Sector(s)

Not applicable.

Competency Field

Equipment Operations