Australian Government

MARB012 Undertake maintenance of machinery, machinery systems and structural components

Release: 1

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Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to establish, organise and implement a preventative and reactive maintenance program and capabilities for machinery, machinery systems and structural components to optimise vessel operational performance.

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

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B - Equipment Checking and Maintenance

Unit Sector

Not applicable.

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Verify maintenance requirements	1.1 Maintenance program regulatory and organisational requirements for machinery, machinery systems and structural components are identified and followed
	1.2 Technical specifications, service requirements and organisational procedures for machinery, machinery systems and structural components are checked for recommended maintenance requirements
	1.3 Special requirements for maintenance of machinery, machinery systems and structural components are separated from normal lubrication, adjustment and day-to-day

			maintenance schedules
		1.4	Maintenance system goals for machinery, machinery systems and structural components are outlined
		1.5	Maintenance plan and related work schedule for machinery, machinery systems and structural components is developed
2	**Establish maintenance systems**	2.1	Maintenance costs are identified and quantified
		2.2	Processes, procedures and delays are documented
		2.3	Internal and external maintenance providers are specified
		2.4	Maintenance plan is prepared to minimise ship operation costs, waste and harm to the environment
		2.5	Approvals for maintenance plan are negotiated and confirmed
		2.6	Recordkeeping systems are developed and maintained
3	**Organise maintenance activities**	3.1	Schedules and rosters are checked to verify time when maintenance process may be scheduled, including optimal timing for shut down
		3.2	Agreement with the Master is obtained for timing of maintenance tasks to optimise maintenance process and minimise operational disruptions
		3.3	Detailed work plans are developed in line with schedules, availability of expertise, scheduling of resource availability and environmental requirements
		3.4	Team members with required competencies are allocated to maintenance activities
		3.5	Consumables and equipment are secured to meet work plan requirements
		3.6	Externally sourced equipment, consumables and expertise are located and procured
		3.7	Contingency plans are prepared
		3.8	Maintenance schedules and procedures are effectively communicated to the team
4	**Supervise maintenance tasks**	4.1	Job specifications and maintenance tasks are communicated effectively to team members

	4.2	Maintenance and repair tasks are monitored to ensure they satisfy technical specifications
	4.3	Work health and safety (WHS)/occupational health and safety (OHS) requirements are monitored and observed at all times
	4.4	Emergency equipment is made available and working order of this equipment is ensured
	4.5	Contingencies are managed to ensure quality of work is maintained and work is completed within agreed time frame
5 Perform planned maintenance activities	5.1	WHS/OHS risk control measures and procedures for carrying out work are followed
	5.2	Preventative maintenance is carried out in compliance with technical specifications
	5.3	Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes
	5.4	Ongoing quality checks of maintenance work are undertaken according to technical specifications
	5.5	Work is carried out efficiently without waste of materials and damage to equipment, machinery or other services
	5.6	Work site is made safe according to organisational safety procedures
	5.7	Maintenance work is checked to verify that it conforms with technical specifications
6 Perform breakdown maintenance	6.1	Nature of breakdown is ascertained and reported to appropriate personnel or authorities
	6.2	Maintenance records of machinery, machinery systems and structural components related to reported breakdown are reviewed for possible causes
	6.3	Extent of breakdown is evaluated and confirmed using diagnostic and troubleshooting techniques
	6.4	Restrictions are applied to operations where necessary and agreed to with the Master
	6.5	Extent of repair work is ascertained from available evidence

	6.6	Limits of repair work that can be carried out are established
	6.7	Machinery and equipment is isolated
	6.8	Repair work is carried out according to technical specifications
	6.9	Master is notified of completed repair work and details are documented
7 Monitor, adjust and report on implementing the maintenance plan	7.1	Execution of maintenance tasks is monitored to ensure they are completed according to maintenance plan and statutory survey requirements
	7.2	Machinery, machinery systems and structural components are monitored to ensure achievement of planned outcomes
	7.3	Costs are monitored and controlled
	7.4	Adjustments are made to maintenance plan to take into account failure to achieve planned outcomes
	7.5	Reports are completed according to maintenance plan requirements and organisational procedures
	7.6	Recommendations to improve maintenance plan safety, efficiency and effectiveness are implemented under regular review of safety management system
	7.7	Machinery, machinery systems and structural components are maintained in a clean and safe operational condition
8 Carry out damage control procedures	8.1	Damage to vessel hull and watertight integrity is ascertained and monitored according to established procedures and safety regulations
	8.2	After hull damage, appropriate damage control measures are implemented to maintain watertight integrity and to control flooding of vessel according to vessel emergency and safety management plans

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of

competency.

Range of Conditions

Specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Machinery, machinery systems and structural components include one or more of the following:

- electrohydraulic steering gear
- engine and gearbox:
  - cooling systems
  - lubricating systems
- engine fuel systems
- gearbox
- hydraulic systems including steering gear
- pumps and pumping systems for bilge, fuel oil, freshwater and seawater systems
- refrigeration plant and its operation
- refrigeration system components
- steering gear
- transmission systems from engine output shaft to propeller
- two- and four-stroke diesel engines

Special requirements for maintenance include one or more of the following:

- asbestos awareness
- awareness of confined and restricted space operations
- dry docking
- handling refrigerant gas within regulatory requirements

Maintenance tasks include one or more of the following:

- cleaning:
  - coolers
  - filters
- greasing
- maintaining:
  - emergency equipment
  - firefighting and lifesaving equipment
- oiling

	• oily water separator • overhauling and repairing pumps • scheduled survey inspections • topping up oils
Consumables and equipment include one or more of the following:	• cleaning chemicals • coolants • hand and power tools • oils and grease • refrigerant gas • replacement parts • test equipment
Emergency equipment includes one or more of the following:	• communication equipment • emergency lighting • firefighting equipment • first aid provisions • lifesaving equipment
Nature of breakdown includes one or more of the following:	• cooling water system failure • engine failure • exhaust systems • fuel system failure • gearbox failure • loss of control systems • lubricating systems failure • power plant failure • propeller and shafting arrangements • pumping systems failure • refrigeration plant and its operation • steering gear failure
Restrictions applied to operations include one or more of the following:	• stopping or slowing main engine • switching to emergency power
Reports include one or more of the following:	• incident reports • maintenance log

- reports required under planned maintenance system
- survey reports

Unit Mapping Information

This is a new unit. This unit is equivalent to MARB4007A Undertake maintenance of machinery, machinery systems and structural components.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2