Australian Government

MARM007 Assist in the survey of vessel mechanical features

Release: 1

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Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to assist in the survey of operational systems. It covers identifying the principal characteristics of vessel propulsion, steering gear system, deck machinery, pumping systems, power generation, refrigeration plant and navigational systems that require periodic surveys for regulatory requirements.

This unit applies to people working in the maritime industry as a marine surveyor assistant.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Not applicable.

Competency Field

M - Marine Surveying

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	**Follow requirements for surveying propulsion systems**	1.1 Types of propulsion systems used on a range of commercial vessels are accurately identified, and survey requirements are confirmed with surveyor and documented according to organisational requirements
		1.2 Shafting systems operation and maintenance principles are identified and applied to survey plan as necessary
		1.3 Requirements for inspecting propulsion systems and detecting faults are identified and applied during survey
2	**Follow requirements for surveying marine**	2.1 Main components of a four-stroke and two-stroke diesel engine and outboard petrol engines are identified and survey

	engines		requirements are documented according to organisational requirements
		2.2	Diesel and outboard petrol engine operation terminology and principles are applied during survey, in documentation and in reports
		2.3	Main components of marine diesel engine, with its associated gearing are identified, and survey requirements are confirmed with surveyor and documented according to organisational requirements
		2.4	Engine operating principles are defined and considered in survey task where necessary
		2.5	Inspection tasks related to engines are defined and applied
3	**Follow requirements for surveying electrical systems**	3.1	Vessel batteries, starter motors and power distribution systems are assessed, and survey requirements are confirmed with surveyor and documented according to organisational requirements
		3.2	Types of power generating plants used on board a range of commercial vessels are identified and survey requirements are documented as necessary
		3.3	Alternating current (AC) and direct current (DC) generator principles of operation and operating procedures are defined and survey requirements are documented
		3.4	Precautions and procedures for electrical safety during inspection of electrical circuitry and equipment are adhered to according to work health and safety/occupational health and safety (WHS/OHS) and other organisational requirements
4	**Follow requirements for surveying refrigeration plant**	4.1	Principal features and operating characteristics of refrigeration systems used on commercial vessels are identified and survey requirements are confirmed with surveyor, and documented according to organisational requirements
		4.2	Environmental issues and responsibilities concerning refrigeration systems are accurately identified during survey
		4.3	Maintenance requirements of refrigeration systems used on a range of commercial vessels are confirmed with surveyor and documented according to organisational requirements

5	**Follow requirements for surveying vessel pumping systems**	5.1	Principal features and operating characteristics of typical pumping systems and pumping system components used on a range of commercial vessels are confirmed with surveyor and documented according to organisational requirements
		5.2	Inspection tasks for pumping systems are identified and applied during survey
		5.3	Maintenance requirements for vessel pumping systems used on a range of commercial vessels are confirmed with surveyor and documented according to organisational requirements
6	**Follow requirements for surveying steering gear systems**	6.1	Principal features and operating characteristics of marine hydraulic systems typical of a range of commercial vessels to be inspected are identified and confirmed with surveyor, and documented according to organisational requirements
		6.2	Principal features and operating characteristics of typical steering systems and components to be inspected are identified and confirmed with surveyor, and documented according to organisational requirements
		6.3	Requirements for inspecting steering systems and detecting faults are applied during survey
7	**Follow requirements for surveying deck machinery**	7.1	Common types of deck machinery typical to a range of commercial vessels are identified and confirmed with surveyor, and documented according to organisational requirements
		7.2	Requirements for inspecting a range of deck machinery and detecting faults are applied during survey
		7.3	Faults in machinery are detected, confirmed with surveyor and actions to rectify issues are agreed and documented in survey report
8	**Follow requirements for surveying navigational systems**	8.1	Principal features and operational characteristics of a typical navigational system for size and nature of vessel are accurately identified and confirmed with surveyor, and documented according to organisational requirements
		8.2	Navigational equipment and systems are identified and appropriate inspection techniques are incorporated into survey plan
		8.3	Faults in navigational equipment and non-conforming equipment are confirmed with surveyor, and actions to

		rectify issues are identified and documented in survey report
9 Apply risk management practices for surveying fuel systems	9.1	Range of fuel systems and their operational requirements are identified and confirmed with surveyor
	9.2	Typical risks associated with survey tasks for fuel systems are identified and risk minimisation strategies are applied during survey
	9.3	Faults and non-conforming systems are confirmed with surveyor, and actions to rectify issues are identified and documented in survey report

Foundation Skills

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

Range of Conditions

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

Propulsion systems include one or more of the following:	• inboard and outboard engines • propulsion plant – prime mover (diesel engine), shaft and propellers (fixed and controlled pitch) • Schottel or similar azimuth systems • thrusters • water jet units

Shafting systems include one or more of the following:	• gear box
	• propeller
	• shaft:
	  • seals
	  • bearings
	  • couplings
	• stern bearing
	• thrust block

Terminology and main components include one or more of the following:	• bearings • bed plate • crankshaft drive • cylinder block

Engine operating principles include one or more of the following :	• exhaust:
	  • system
	  • valve
	• filters
	• flywheel
	• fuel:
	• injector
	• pump
	• heat exchanger
	• injector
	• inlet valve
	• piston
	• turbo chargers
	• requirements for diesel engines for:
	  • propulsion
	  • power generation
	  • emergency use

Power distribution systems include one or more of the following:	• circuit breakers • distribution boards • shore power changeover arrangements
Power generating plants include one or more of the following:	• diesel engine • hybrid system • solar generation • wind generation
Refrigeration systems include one or more of the following:	• compressors • different types of gasses • evaporators
Environmental issues include one or more of the following:	• chlorofluorocarbons (CFCs) used in refrigerants • diesel and steam engines to power refrigeration, lights, pumps and other functions • ozone depleting substances (ODSs) • water treatment chemicals and chemicals from refrigeration equipment
Operating characteristics of typical pumping systems include one or more of the following:	• back flooding prevention procedures • drive systems, belts, clutches and motors • fire, bilge and tank circulating systems • standard identification markings

Hydraulic systems include one or more of the following:	• strainers, strum and mud boxes, and foot valves • use of flexible materials and hoses • valve types, including their construction and maintenance • electro hydraulic steering gears • emergency operation in electrical or hydraulic failure • preventative and remedial maintenance requirements of hydraulic systems • simple hydraulic circuits
Steering systems and components include one or more of the following:	• rudder and stock support bearings • rudder construction features • rudder types • glands, packing and seals • requirements for maintaining and testing steering and related hydraulic systems • steering operation using hydraulic, cable, rod and gear • tiller arm attachment
Deck machinery includes one or more of the following:	• basic hydraulic systems • derricks and booms • fishing gear • lifting equipment • safeguards and protective devices for winches • small cranes • winches • windlasses
Navigational system includes one or more of the following:	• AIS • charts • compass • GPS • plotters • radar • sounders
Typical risks include one or more of the following:	• fire • inhalation and poisoning • injury • marine pollution

Unit Mapping Information

This unit replaces and is equivalent to MARM4003A Assist in the survey of vessel mechanical features.

Links

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