



Australian Government

MARL054 Demonstrate basic knowledge of marine auxiliary boilers

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package.

Application

This unit involves the skills and knowledge required to operate and maintain marine auxiliary boilers on a commercial vessel.

This unit applies to people working in the maritime industry in the capacity of:

- Electro-Technical Officer (STCW Electro-Technical Officer Unlimited)
- Engineer Class 3 Near Coastal
- Engineer Watchkeeper (STCW Engineer Watchkeeper Unlimited).

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit.

- Regulatory requirements include STCW International Maritime Organization (IMO) model course competencies and areas of knowledge, understanding and proficiency, together with the estimated total hours required for lectures and practical exercises. Teaching staff should note that timings are suggestions only and should be adapted to suit individual groups of trainees depending on their experience, ability, equipment and staff available for training.

Near Coastal Qualifications:

- This unit is one of the requirements to obtain Australian Maritime Safety Authority (AMSA) certification as an Engineer Class 3 Near Coastal as defined in the Marine Order 505 (Certificates of competency - National Law) 2013.

Blue Waters Qualifications:

- This unit is one of the requirements to obtain Australian Maritime Safety Authority (AMSA) certification as an Electro-Technical Officer (STCW Electro-Technical Officer Unlimited) or Engineer Watchkeeper (STCW Engineer Watchkeeper Unlimited) and to meet regulatory requirements this unit must be delivered consistent with Marine Orders and with the relevant sections of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

Pre-requisite Unit

Not applicable.

Competency Field

L - Engineering

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Distinguish between different types of auxiliary boilers

2 Recognise different functions of steam and different components of steam systems

3 Explain fuel oil system of auxiliary boilers

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Design and use of water tube and fire tube auxiliary boilers are compared and contrasted

1.2 Movement of water and gas in an operating boiler is sketched

1.3 How variations to operating pressure and saturation temperature in an auxiliary boiler can be used to get wet, dry or superheated steam is explained

2.1 Key features of steam and other heating systems are compared and contrasted

2.2 Steam side requirements of an auxiliary steam turbo alternator are compared and contrasted with other steam-powered machinery

2.3 Typical steam and condensate system are outlined

3.1 Combustion process is explained and factors that affect combustion in a boiler are outlined

3.2 Differentiation is made between different burner types

	3.3	Operation of a complete fuel oil system for an auxiliary boiler, including the functions of components for automatic combustion control, is outlined
4 Explain procedures for operating fired and unfired boilers	4.1	Locations of all mountings and fittings on auxiliary boilers are identified and their functions are outlined
	4.2	Purpose of all alarms and shutdowns incorporated in auxiliary boilers is clarified
	4.3	Types and operation of safety valves are outlined
	4.4	Procedure for lighting off a boiler from cold is clarified
	4.5	Procedure for laying up for short and long periods, including full blow down and shutdown procedures, is clarified
	4.6	Procedure for isolating an auxiliary boiler after shutdown is clarified
5 Explain procedures for sampling and testing boiler water	5.1	Effects of poor water treatment practices on safety and boiler function are identified
	5.2	Correct procedure for taking boiler and feed water sample and possible errors that might occur are clarified
	5.3	Common water tests carried out are outlined and typical results are stated
	5.4	Chemicals used for treatment of boiler water are named and acceptable range of chemical reserves found in boiler waters are confirmed
6 Explain procedure for maintaining water level in the boiler	6.1	Method of testing and changing a gauge glass is outlined
	6.2	Effects of blockages in water, steam and drain cocks on levels in gauge glass are outlined
	6.3	Procedure for when a gauge glass apparently shows no water is clarified
7 Explain common hazards and defects and relevant prevention/ control	7.1	Hazards and defects associated with auxiliary boilers are identified

procedures

- 7.2 How water hammer can be prevented in auxiliary boilers is outlined
- 7.3 Symptoms, causes, effects and actions to be taken in the event of oil contamination of boiler water are determined
- 7.4 Difference between and measures taken to avoid fire and water side explosions are clarified
- 7.5 Causes, mechanism, prevention and control of economiser fires are detailed

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.

Unit Mapping Information

This unit replaces and is equivalent to MARL003 Demonstrate basic knowledge of marine auxiliary boilers.

Links

Companion Volume implementation guide can be found in VetNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>