



Regulated Qualifications Unit and Assessment Specification

Unit title	Safe Operation of Merchant Vessel Machinery Systems
Regulator unit code	R/503/2633
SQA unit code	FN1V 54
SSC ref	Unit 26

History of changes

Publication date: June 2011

Version: 02 (December 2017)

Version number	Date	Description	Authorised by
02	December 2017	Unit Specification updated to reflect current Ofqual terminology.	Qualifications Officer

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Regulated qualifications unit specification

Title	Safe Operation of Merchant Vessel Machinery Systems	
Level	2	
Credit value	4	
Outcomes	Assessment criteria	
The learner will:	The learner can:	
1 Know the requirements of the code of safe working practices for work on machinery systems.	1.1 Describe the personal protective equipment required for work on machinery systems. 1.2 Identify the meaning of common shipboard safety signs and the precautions required by them. 1.3 Describe the basic precautions to be taken for safe movement around the ship, including passage through watertight doors. 1.4 Describe the basic precautions to be taken for work in enclosed spaces when working under supervision. 1.5 Describe the precautions to be taken before using lifting equipment. 1.6 Identify the basic requirements of a 'permit to work' and instances when it would be used. 1.7 Describe the precautions to be taken when using hand tools. 1.8 Describe the precautions to be taken when using portable power tools. 1.9 Describe the dangers of hazardous substances including oils, asbestos, chemical agents, and pesticides. 1.10 Identify the procedures to be followed for the disposal of bilge water.	

Outcomes	Assessment criteria
The learner will:	The learner can:
<p>2 Know the function and basic operating principles of the main items of plant within machinery spaces.</p>	<p>2.1 Describe the two stroke and four stroke cycles for compression ignition engines.</p> <p>2.2 Identify the main component parts of an engine, including cylinder head, liner, piston, connecting rod, piston rod, piston rings, stuffing box, bottom/top/main bearings, crankshaft, camshaft, fuel pump, fuel injector.</p> <p>2.3 Identify the components of the engine air induction and exhaust system including: scavenge air and exhaust receivers, turbochargers, and auxiliary blowers.</p> <p>2.4 Identify main engine types and layouts including slow speed, medium speed, high speed, single and multi engine arrangements, basic layout of steam propulsion plant, thrust blocks and gear boxes.</p> <p>2.5 Identify the main components and function of ancillary systems required to operate a diesel engine:</p> <ul style="list-style-type: none"> ◆ fuel oil system ◆ starting air system ◆ lubricating oil system ◆ fresh water cooling system ◆ sea water cooling system <p>2.6 Identify the main constructional features of a boiler including furnace, gas paths and water paths.</p> <p>2.7 Identify the main boiler mountings and state their purpose to include steam and feed valves, boiler water level indicators, safety valves, blow-down valves and flame detector.</p> <p>2.8 Explain why purging of the furnace must take place before firing a boiler.</p> <p>2.9 Explain why boiler water level must be maintained within the sight glass.</p> <p>2.10 Explain why boiler feed water must be treated to prevent scale formation and corrosion within the boiler.</p>

Outcomes	Assessment criteria
The learner will:	The learner can:
	<p>2.11 Identify the common symbols used on engine room pipeline diagrams including screw lift valves, non-return valves, pumps, quick closing valves, heaters, and coolers.</p> <p>2.12 Identify the main components and purpose of:</p> <ul style="list-style-type: none"> ◆ sewage systems ◆ steering gear ◆ fresh water production systems ◆ bilge systems ◆ ballast systems ◆ fixed ER fire-fighting systems

Additional information about the unit
Unit purpose and aim(s)
<p>To enable persons to work safely in the engine rooms of typical merchant vessels at the support level.</p> <p>To introduce engine-room mechanical systems to new entrants to the marine industry.</p>
Unit start date
01/06/2011
Details of the relationship between the unit and relevant national occupational standards or other professional standards or curricula (if appropriate)
<p>MNTB/SFIA Marine NOS NOS A11 (part), A31 (part), C02 (part), C31 (part). The other parts of these standards will be met by shipboard training which will also consolidate the knowledge gained in this unit. MNTB/SFIA Underpinning Knowledge Library Documents</p>
Assessment requirements specified by a sector or regulatory body (if appropriate)
<p>Assessment will be by a combination of the following methods — assignment; knowledge based testing; project work; presentation; practical demonstration; other, - as agreed by the external verifier</p>
Endorsement of the unit by a sector or other appropriate body (if required)
<p>Maritime Skills Alliance Merchant Navy Training Board</p>
Location of the unit within the subject/sector classification system
4.3 Transportation Operations and Maintenance
Name of the organisation submitting the unit
SQA
Guided learning hours
36

Regulated qualifications assessment specification

Assessment (evidence) requirements

The following evidence is required to demonstrate that learners have the appropriate level of knowledge to work safely in the engine rooms of typical merchant vessels at the support level. All outcomes and assessment criteria must be achieved.

Written and/or recorded oral evidence produced either on or off-the-job is required for the following:

- ◆ Outcomes 1 and 2

An approved Maritime Skills Alliance (MSA) approved Training Record Book (TRB) should be used to record evidence of achievement.

Guidance on assessment

- ◆ Short answer written questions
- ◆ Oral interview
- ◆ Logbook