Regulated Qualifications Unit and Assessment Specification

Unit title	Control Marine Electronic Navigation Systems
Regulator unit code	F/504/1134
SQA unit code	H3M8 57
SSC ref	Unit 89

History of changes

Publication date: March 2013

Version: 02 (December 2017)

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

Regulated qualifications unit specification

Title	Control Marine Electronic Navigation Systems
Level	3
Credit value	8

Outcomes **The learner will:**	**Assessment criteria** **The learner can:**
1 Know how to use hyperbolic navigation systems.	1.1 Define: ♦ Hyperbola ♦ Hyperbolic pattern for two foci ♦ Methods used to resolve ambiguity 1.2 State the accuracy of hyperbolic navigation systems. 1.3 Explain the hyperbolic pattern produced by staggering pulses from master and slave transmitters. 1.4 Explain: ♦ Chain identification ♦ Cycle matching ♦ Ground wave versus sky wave reception ♦ Slave identification ♦ Slave election ♦ Corrections to received signal 1.5 Identify the limitations of hyperbolic navigation systems including: ♦ Coverage ♦ Additional secondary factor (ASF) ♦ Envelope-to-cycle discrepancy (ECD) ♦ Automatic operation ♦ Errors
2 Be able to use hyperbolic navigation systems.	2.1 Demonstrate correct use of a hyperbolic navigation system to navigate a vessel including man overboard facility.

Outcomes The learner will:	Assessment criteria The learner can:
3 Know how to use global navigation satellite systems.	3.1 Explain the basic principles of operation of the Global Positioning System (GPS). 3.2 Compare key features of GPS with other global navigation satellite systems in general use. 3.3 Identify the limitations of satellite positioning systems. 3.4 Explain the principles of local and wide area augmentation. 3.5 Explain the super-imposition and interfacing from other systems including Eurofix.
4 Be able to use global navigation satellite systems.	4.1 Demonstrate correct set up of a satellite positioning system. 4.2 Demonstrate correct use of a satellite positioning system. 4.3 Use way-point navigation to prepare and monitor routes. 4.4 Use man overboard function.
5 Know how to use vessels' compasses.	5.1 Explain the procedures for checking the magnetic compass. 5.2 Explain the procedure for checking gyro compass operation. 5.3 Explain the use of fibre optic gyro controls. 5.4 Explain the use of laser ring gyro controls.
6 Be able to use vessels' compasses.	6.1 Demonstrate use of the magnetic compass. 6.2 Demonstrate use of the gyro compass.

Outcomes The learner will:	Assessment criteria The learner can:
7 Know how to use steering control systems.	7.1 Explain the features of steering control systems. 7.2 Explain the routine procedures for the operation of auto pilot systems. 7.3 Describe the operation of the principle auto pilot controls.
8 Be able to use steering control systems safely.	8.1 Respond correctly to steering control system and operational alarms.
9 Know how to use speed distance measuring equipment.	9.1 Explain the principles of a doppler log installation. 9.2 Explain the different modes of a doppler log. 9.3 Explain the principles of electromagnetic speed distance measuring equipment. 9.4 Identify possible equipment errors and limitations. 9.5 Describe the performance standard for speed distance measuring equipment.
10 Be able to use speed distance measuring equipment.	10.1 Use a doppler log correctly in ground and water track modes. 10.2 Use speed distance measuring equipment to maintain a safe navigational watch. 10.3 Respond correctly to system and operational alarms.
11 Know how to use marine echo sounders.	11.1 Explain the principles that enable the use of ultrasonic waves in sea water. 11.2 Describe the characteristics of typical echo sounders. 11.3 Explain the function of controls on typical echo sounders. 11.4 Produce a functional block diagram of a typical echo sounder unit.

Outcomes The learner will:	Assessment criteria The learner can:
12 Be able to use marine echo sounders.	12.1 Interpret information from an echo sounder correctly. 12.2 Use the information from an echo sounder correctly.
13 Know the principles relating to radio waves used in electronic navigational systems.	13.1 Explain the characteristics of radio waves. 13.2 Explain the factors affecting the propagation of radio waves. 13.3 Explain types of transmission in common use. 13.4 Explain phase coding. 13.5 Explain pulse modulation. 13.6 Explain amplification requirements.

Additional information about the unit
Unit purpose and aim(s)
Covers competence and underpinning knowledge required to control the use of marine electronic navigational systems by the person in charge of a navigational watch on any size of vessel operating in any area.
Unit start date
01/06/2013
Details of the relationship between the unit and relevant national occupational standards (if appropriate)
Maritime NOS (Jan 2012) — B02 Maintain a navigational watch
Details of the relationship between the unit and other standards or curricula (if appropriate)
Seafarer's Training, Certification and Watchkeeping Code (Table A-ll/1); MNTB guidance on Navigation, Radar, ARPA, ECDIS & AIS Simulator Training (operational level).
Assessment requirements specified by a sector or regulatory body (if appropriate)
Maritime Skills Alliance's Assessment Strategy and Maritime and Coastguard Agency requirements MNTB guidance on Navigation, Radar, ARPA, ECDIS & AIS Simulator Training (operational level).
Endorsement of the unit by a sector or other appropriate body (if required)
Maritime Skills Alliance
Location of the unit within the subject/sector classification system
4.3 Transportation Operations and Maintenance
Name of the organisation submitting the unit
Skills for Logistics
Guided learning hours
70

Regulated qualifications assessment specification

Assessment (evidence) requirements
The following evidence is required to demonstrate that learners have the appropriate level of knowledge to undertake the control of marine electronic navigation systems. 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, 3, 5, 7, 9, 11 and 13 This could be achieved through oral questioning of learners. Assessment evidence in the workplace or in an appropriate simulated environment is required for the following: ♦ Outcomes 2, 4, 6, 8, 10 and 12 This could be achieved through the observation of learners undertaking practical exercises. An approved Maritime Skills Alliance (MSA) approved Training Record Book (TRB) should be used to record evidence of achievement.
Guidance on assessment
Assessment evidence can be generated using an approved Maritime Skills Alliance (MSA) approved Training Record Book (TRB) and/or practical exercises. Short answer written questions and/or oral interview could be used for the other outcomes and assessment criteria.