

Higher National Unit Specification

General information for centres

Unit title: Bridge Watchkeeping

Unit code: F0LR 34

Unit purpose: This Unit is about applying regulations and systems for the safe movement of vessels and develops a thorough knowledge of the content of the International Regulations for Preventing Collisions at Sea (IRPCS) and the International Association of Lighthouse Authorities (IALA) buoyage systems. It also covers Bridge Watchkeeping Procedures, vessel manoeuvres and steering systems. The Unit is primarily intended for candidates who are new entrants to the Merchant Navy via one of the Merchant Navy Training Board (MNTB) approved deck cadet training schemes or for seafarers who are enrolled on a rating to Officer conversion course. Ideally candidates would have already accrued some shipboard experience prior to attempting this Unit, although this is not a prerequisite.

On completion of the Unit the candidate should be able to:

- 1 Interpret and apply regulations and systems for the safe movement of vessels.
- 2 Describe bridge watchkeeping procedures.
- 3 Explain basic vessel hydrodynamics, the factors affecting manoeuvres, and how to make them.

Credit points and level: 1.5 HN Credits at SCQF level 7: (12 SCQF credit points at SCQF level 7*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Recommended prior knowledge and skills: Access to this Unit is at the discretion of the centre. However, candidates would benefit most from this Unit if they have successfully completed the *Marine Induction Course* associated with the HNC/HND Nautical Science.

Core Skills: There are opportunities to develop the following Core Skills in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Communication: Written at SCQF level 5

Communication: Reading at SCQF level 5

Communication: Oral at SCQF level 6

Numeracy: Using Graphical Information at SCQF level 5

General information for centres (cont)

Using Information Technology at SCQF level 5

Problem Solving: Critical Thinking at SCQF level 5

Problem Solving: Planning and Organising at SCQF level 5

Problem Solving Reviewing and Evaluating at SCQF level 5

Working with Others at SCQF level 5

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Assessment: Outcome 1 may be assessed by short answer questions under supervised conditions on the content and application of the IRPCS and IALA buoyage systems. The use of computer aided learning packages for the assessment of this Outcome is recommended.

Outcomes 2 and 3 may be assessed by short answer questions under supervised conditions on bridge watchkeeping procedures and shiphandling.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, knowledge and/or skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Interpret and apply regulations and systems for the safe movement of vessels

Knowledge and/or skills

- ◆ Application and Interpretation of the IRPCS
- ◆ Application and Interpretation of the IALA Buoyage systems

Evidence Requirements

All knowledge and skills are assessed, however there is sampling **within** each of the knowledge and skills.

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

- ◆ interpret and apply the International Regulations for Preventing Collisions at Sea.(IRPCS)

On each assessment occasion candidates should be given the opportunity to demonstrate that they can apply the IRPCS for both daylight, nighttime and restricted visibility encounters with other vessels.

The candidate should be advised that their own vessel is a power driven vessel and in each case should be required to interpret and identify the lights, shapes and sound signals exhibited by a sample of six of the following:

- ◆ vessels not under command
- ◆ vessels engaged in fishing
- ◆ vessels engaged in trawling
- ◆ sailing vessels
- ◆ pilot vessels
- ◆ vessels restricted in their ability to manoeuvre
- ◆ vessels at anchor
- ◆ vessels aground
- ◆ vessels engaged in towing
- ◆ power driven vessels

Higher National Unit specification: statement of standards (cont)

Unit title: Bridge Watchkeeping

In each situation the candidate must identify the type of vessel from the lights, shapes or sound signal exhibited. They must also give a clear explanation, with respect the rules of sections A and B of the IRPCS, of the action that their own vessel must take in order that the IRPCS are complied with in each situation. An assessor must ensure that a mixture of daylight, nighttime and restricted visibility situations be used on each assessment occasion.

A different sample should be used on each occasion.

- ◆ Interpret and apply the IALA system of buoyage, systems A & B.

Candidates should produce evidence that they can identify a sample of eight from the following:

- ◆ Any of the four Cardinal Marks:
 - Safe Water Marks
 - Isolated Danger Marks
- ◆ Any of the three Special Marks:
 - Port Hand Marks (Both System A & B)
 - Starboard (Stbd) Hand Marks (Both System A & B)
 - Preferred Channel to Port Marks (Both System A & B)
 - Preferred Channel to Stbd Marks (Both System A & B)

For each of the buoys, in the chosen sample, candidates must describe the light characteristics, shape, colour and top mark of the buoy. Candidates must also be able to describe the action to be taken when encountering each of the above buoys, to ensure that the vessel remains in safe water.

A different sample should be used on each assessment occasion.

Assessment guidelines

Outcome 1 may be assessed on a sample basis by a combination of short answer questions under supervised conditions on the content of the IRCPS and IALA buoyage systems and on their application. The use of computer aided learning packages for the assessment of this Outcome is recommended.

Outcome 2

Describe bridge watchkeeping procedures

Knowledge and/or skills

- ◆ Bridge Watchkeeping procedures itemised in:
 - current national regulations
 - international regulations
 - international and national guidelines.
 - The International Chamber of Shipping (ICS) Bridge Procedures Guide (BPG)
- ◆ Communications between bridge and engine personnel

Higher National Unit specification: statement of standards (cont)

Unit title: Bridge Watchkeeping

Evidence Requirements

All knowledge and skills are assessed, however there is sampling **within** each of the knowledge and skills.

- ◆ Describe bridge watchkeeping procedures with respect to current regulations and guidelines.

On each assessment occasion candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

Describe, from a sample of at least **six** of the following:

- ◆ procedures for maintaining an effective lookout
- ◆ when to call the Master
- ◆ proper use of electronic navigation equipment found on the bridge, including the checks which are required to be carried out and the action to be taken in the event of failure of equipment
- ◆ precautions required for protection of the marine environment
- ◆ effective use of the main engine and steering controls
- ◆ the basic principles of passage planning
- ◆ contents of M Notices relevant to bridge operations
- ◆ procedures to be followed when the vessel is under pilotage
- ◆ procedures to be followed in heavy weather
- ◆ action to be taken on sighting dangerous ice
- ◆ procedures to be followed in emergency situations
- ◆ procedures for maintaining a deck watch in port

A different sample should be used on each occasion.

- ◆ Describe the procedures relating to communications between bridge and engine personnel.

On each assessment occasion candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

Describe, from a sample of at least **three** of the following:

- ◆ the procedures for communicating with the engine room
- ◆ the procedures to be taken in the event of main engine or steering gear failure
- ◆ the correct procedures for altering the vessels speed or heading
- ◆ the action to be taken when engine room alarms are activated
- ◆ when to call the duty engineer
- ◆ the preparations to be carried out when the vessel is entering and leaving port

A different sample should be used on each assessment occasion.

Higher National Unit specification: statement of standards (cont)

Unit title: Bridge Watchkeeping

Assessment guidelines

Outcome 2 will be assessed by short answer questions under supervised conditions on the content of regulations and guidelines pertaining to Bridge Watchkeeping at the operational level and on accepted procedures to be adopted in various situations as described in the ICS Bridge Procedures Guide.

Outcomes 1 and 2 may be combined for assessment purposes.

Where possible candidates should relate responses to the types of vessels on which they have experience.

Outcome 3

Explain basic vessel hydrodynamics, the factors affecting manoeuvres, and how to make manoeuvres

Knowledge and/or skills

- ◆ Factors which have an effect on manoeuvres, turning circles, and stopping distances
- ◆ Manoeuvring a vessel

Evidence Requirements

All knowledge and skills are assessed, however there is sampling **within** each of the knowledge and skills.

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can correctly:

- ◆ explain the factors which affect manoeuvring characteristics and stopping distances from a sample of **three** of the following:
 - Deadweight.
 - Draught and trim.
 - Speed and rudder angle.
 - Transverse thrust.
 - Single, twin and controllable and fixed pitch propellers.
 - Underkeel clearance.
 - Working with tugs and the danger of girding.
 - Dangers of pitching, pounding, rolling, synchronous rolling, racing, and broaching.
 - Interaction with the sea bed, banks and shoals and other vessels
- ◆ explain how to make manoeuvres from a sample of three of the following:
 - Turning short round
 - Emergency stop: Crash stop, high frequency and low frequency cycling
 - Man overboard manoeuvres: Williamson, Scharnow and Anderson turns
 - Manoeuvre to minimise collision damage
 - Turning in heavy weather

Higher National Unit specification: statement of standards (cont)

Unit title: Bridge Watchkeeping

Assessment guidelines

Outcome 3 will be assessed by short answer questions under supervised conditions.

Administrative Information

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Unit title: Bridge Watchkeeping
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Higher National Unit specification: support notes

Unit title: Bridge Watchkeeping

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 60 hours.

Guidance on the content and context for this Unit

The content of this Unit forms part of the underpinning knowledge for the Level 3 SVQ *Marine Vessel Operations* and reflects the content of International Maritime Organisation's *Standards of Training Certification and Watchkeeping (STCW)*.

The knowledge and skills contained within the Unit cover all the requirements as laid down by Standards for Training and Certification of Watchkeepers (STCW) 95 at the Operational level aboard ship.

Completion of the Unit will also ensure that the candidate complies with all the requirements laid down by the UK Maritime and Coastguard Agency (MCA) for the issue of an Officer of the Watch Unlimited Certificate of Competency as a Deck Officer. The required knowledge and skills for MCA certification can be found in a document detailing the requirements for the issue of an Education and Training Certificate (A&B), which is available from the MNTB.

The following notes give additional information on the knowledge and skills for each of the four outcomes.

Outcome 1

The content and context of the International Regulations for the Prevention of Collisions at Sea will be thoroughly explored and the criteria to ensure the correct identification of vessels by day and night and in restricted visibility explained. The contents of the rules of sections A and B of the IRPCS will be examined and their application discussed. Candidates will be encouraged to discuss these topics in light of their own shipboard experience, when keeping bridge watches under supervision.

The correct action to be taken when encountering vessels such that a developing risk of collision or a close quarters situation is safely resolved will be explained and demonstrated using model ships and multimedia presentations.

The IALA system of buoyage will be examined and the differences between systems A and B explained. The characteristics of each type of buoy (light, shape, colour and topmark) will be discussed and their use and deployment for the safety of navigation explained.

Model buoys and multimedia presentations will be used extensively to ensure that candidates are thoroughly familiar with all buoys that they are likely to encounter

It is recommended that oral examinations be utilised, where appropriate in Outcome 1 and 2 to ensure candidates are given experience of MCA Oral examination conditions

Higher National Unit specification: support notes (cont)

Unit title: Bridge Watchkeeping

This can be viewed as preparation for candidates taking the MCA Oral examination at OOW level. In order to succeed in this examination no errors in either application of the IRPCS or interpretation of the buoyage system are permitted. A mistake in either of these categories will result in automatic failure in the examination.

Assessments for this Outcome should comply with a similar standard. When setting this assessment it is advisable to refer to past papers from OOW Oral examinations.

Outcome 2

This Outcome deals with nationally and internationally recognised procedures for ensuring that candidates are competent to be in charge of a bridge or deck watch on board ship. Extensive reference will be made to the contents of Chapter 8 in Section A of STCW 95 and also current national regulations promulgated in M Notices and Statutory Instruments, including Chapter 5 of the convention on the Safety of Life at Sea (SOLAS). The role of the Bridge Procedures Guide will be examined and the recommendations it contains, with regard to, Watchkeeping, use of electronic navigational aids, prevention of pollution and the roles of the crew, officers and Master in ensuring the safety of navigation discussed.

It is recommended that assessment in the form of an oral examination on the factors affecting manoeuvres and oral questions, using ship models on how manoeuvres would be carried out, would be appropriate. This would give candidates experience of conditions likely to be encountered in the MCA Oral examination.

Wherever possible the content of this Outcome should be related to the candidate's own experience aboard ship.

Outcome 3

This introduces candidates to the principles behind the art of shiphandling and the factors that affect manoeuvrability of a vessel in all situations. The design features of the vessel which affect its performance will be investigated as well as the environmental and hydrodynamic factors which are likely to be encountered. The ability to recognise when these factors are in play and the necessary action to be taken will be discussed with a view to maintaining the safe navigation of the vessel.

Simple manoeuvres, likely to be executed by the Officer of the Watch will be demonstrated and emergency manoeuvres which may be required discussed, with particular reference to the safety of the vessel, crew, cargo and environment.

Extensive use of ship models will enable the candidate to gain confidence in describing in detail the various stages of individual manoeuvres.

Higher National Unit specification: support notes (cont)

Unit title: Bridge Watchkeeping

Guidance on the delivery and assessment of this Unit

It is suggested that this Unit should be delivered concurrently with HN Units FOLS 35 *Celestial Navigation*, FOM0 34 *Navigational Mathematics and Science* and FOLV 34 *Chartwork and Tides*.

The knowledge and skills acquired in this Unit will be practised extensively at sea so that the experience gained can be utilised in HN Unit FOLG 35 *Marine Passage Planning*, FOLW 35 *Management of Bridge Operations* and HN Unit FOLB 35 *Shipboard Management* which feature in the later stages of the HND Nautical Science.

Opportunities for developing Core Skills

The Unit provides candidates with the opportunity to develop the Core Skill of Communication: Writing and Reading at SCQF level 5. Candidates will develop the use of both by having to read and understand complex legislation found in Statutory Instruments and will have to present this in plain English in written assessment. The Core Skill of Communication: Oral at SCQF level 6 can be developed through the candidate having to explain the complexity of vessel design and other factors which affect the manoeuvring characteristics of a vessel.

Numeracy: Using Graphical Information at SCQF level 5 may be developed by the candidate analysing and explaining the manoeuvring diagrams of a vessel.

Using Information Technology at SCQF level 5 may be developed by candidates using the Internet to source legislation and articles relevant to Bridge Watchkeeping procedures and ship handling.

The Core Skill of Problem Solving: Critical Thinking, Planning and Organising and Reviewing and Evaluating may be developed by candidates having to solve ship handling problems involving multiple variables. This will require them to think about the problems involved in carrying out a manoeuvre, planning the helm and engine movements required to carry out the manoeuvre and then evaluating if the plan results in the manoeuvre being carried out safely.

The Core Skill of Working with Others at SCQF Level 5 can be developed by the use of group work when discussing watchkeeping procedures and using the experience of others in the class to broaden their experience of problems encountered on different ship types.

Open learning

This Unit is not suited to delivery by distance learning because it requires candidates to be observed and questioned by a qualified practitioner to meet Statutory/professional body requirements

Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance on Alternative Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs*, which is available on SQA's website: www.sqa.org.uk.

General information for candidates

Unit title: Bridge Watchkeeping

This Unit is designed to provide you with the knowledge and skills required to take charge of a bridge or deck watch and be able to deal with common problems that are likely to arise at an operational level.

It discusses the recommended procedures that can be utilised to ensure that your watchkeeping competence meets the requirements under STCW 95. Extensive use will be made of current regulations and guidance available from a variety of sources and you will be required to utilise the internet to source some of this material.

Wherever possible you will be encouraged to discuss and evaluate the watchkeeping procedures that you have experienced on board ship and share this experience with your classmates. Particular emphasis will be placed on ensuring that you have a thorough comprehension of the International Regulations for the Prevention of Collisions at Sea and also the IALA buoyage system. You should relate your own shipboard experience to the application of the Rules and those of others who may have been on different types of vessels.

You will investigate the basic principles involved in ensuring that proper watchkeeping procedures are established and that these take account of the guidance that is contained in STCW 95 Chapter 8 Section A and other MCA guidelines currently in force. The role of senior officers and crew members in maintaining a safe watch will be explained and the limitations of the OOW discussed with relation to his role.

The various watchkeeping strategies to be employed in differing situations will be examined and the action to be taken in the event of shipboard emergencies outlined. The importance of pollution and protection of the marine environment will be highlighted. Extensive reference will be made to the ICS Bridge Procedures Guide and its contents and you will be expected to be thoroughly familiar with this publication by the end of the Unit.

The basic principles of ship manoeuvring will be discussed and in particular you will be expected to recognise the possibility of dangerous situations arising and the necessary action to be taken to ensure the safety of the vessel.

Simple ship manoeuvres will be demonstrated and you will be expected to demonstrate how to carry out these manoeuvres using model ships. You will be required to explain in detail what the actions of the OOW should be whilst these manoeuvres are being executed.

The relationship between the bridge and the engine room will also be explained in sufficient detail for the operational level at STCW95.