

Higher National Unit Specification

General information for centres

Unit title: Marine Cargo Operations

Unit code: F0LM 34

Unit purpose: This Unit is designed to provide candidates with underpinning knowledge of a range of topics which will allow them to safely and efficiently carry out their duties as a Deck Officer of the Watch onboard a merchant vessel during cargo operations. It is primarily aimed at candidates who intend seeking a career as a Deck Officer in the Merchant Navy. However, it could also be studied by someone with an interest in the subject area.

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

- 1 Explain the principles and safe working practices for the proper loading, stowage and carriage of dry cargoes.
- 2 Explain the principles and safe methods of arranging for the proper loading, stowage and carriage of bulk liquid and chemical cargoes.
- 3 Explain the duties of the Officer of the Watch (OOW) whilst maintaining a deck cargo watch.
- 4 Explain the precautions and procedures to be taken to prevent pollution of the marine environment.

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/D Nautical Science.

Core Skills: There are opportunities to develop the Core Skill(s) of:

Communication: Oral	at SCQF level 5
Communication: Reading	at SCQF level 5
Communication: Written	at SCQF level 5
Numeracy: Using Number	at SCQF level 4
Numeracy: Using Graphical Information	at SCQF level 4
Using Information Technology:	at SCQF level 5
Problem Solving: Critical Thinking	at SCQF level 6
Problem Solving: Planning and Organising	at SCQF level 6
Problem Solving: Reviewing and Evaluating	at SCQF level 6
Working with Others	at SCQF level 6

General information for centres (cont)

in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

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: Outcomes 1, 2 and 3 may be assessed by means of a closed-book assessment under supervised conditions consisting of a mixture of short answer/structured questions and cargo calculations.

Outcome 4 may be assessed by means of a closed-book assessment under supervised conditions, consisting of short answer questions.

Higher National Unit specification: statement of standards

Unit title: Marine Cargo Operations

Unit code: F0LM 34

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

Explain the principles and safe working practices for the proper loading, stowage and carriage of dry cargoes

Knowledge and/or skills

- ◆ Loading, discharging, securing and carriage of dry cargoes
- ◆ Legislation regarding carriage of cargoes
- ◆ Procedures to ensure efficient cargo operations
- ◆ Cargo handling equipment
- ◆ Cargo calculations

Evidence Requirements

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

- 1 Explain the loading, discharging and carriage requirements for a sample of two from the following:
 - (a) Containerised cargoes
 - (b) Timber cargoes
 - (c) General cargoes
 - (d) Deck cargoes
 - (e) Refrigerated cargoes
 - (f) Dry bulk cargoes
 - (g) Vehicular/Roll On-Roll Off cargoes
- 2 Summarise the legislation regarding loading, discharging, carriage and securing of a sample of one from the following:
 - (a) Dangerous goods
 - (b) Timber deck cargoes
 - (c) Grain cargoes
 - (d) Vehicular cargoes

Higher National Unit specification: statement of standards (cont)

Unit title: Marine Cargo Operations

- 3 Explain watchkeeping procedures to ensure cargo operations progress in a safe and efficient manner and comply with current legislation.
- 4 Describe the use and maintenance of cargo handling equipment as per current legislation and guidance.
- 5 Perform basic cargo calculations.

Where sampling is used a different sample should be used on each assessment occasion.

Assessment guidelines

Outcome 1 may be assessed by means of a closed-book assessment under supervised conditions consisting of a mixture of short answer and structured questions.

Outcomes 1 – 4 may be combined for assessment purposes.

Outcome 2

Explain the principles and safe methods of arranging for the proper loading, stowage and carriage of bulk liquid and chemical cargoes

Knowledge and/or skills

- ◆ Loading, discharging, securing and carriage of bulk liquid cargoes
- ◆ Tank entry procedures
- ◆ Inert gas systems
- ◆ Crude oil washing and tank/pipeline cleaning
- ◆ Ballast management
- ◆ Single/multiple grade cargoes
- ◆ Liquid cargo calculations

Evidence Requirements

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

- ◆ Describe the common pipeline systems found on tankers
- ◆ Explain the use, calibration and limitations of safety equipment used to test atmospheres within tanks and enclosed spaces
- ◆ Explain the procedures to be adopted for *either* routine *or* emergency tank entry situations
- ◆ Describe the main features of an inert gas system
(Candidates will be required to produce a sketch showing the main components of an inert gas system and must explain the circumstances when the system must be used and explain the operation of alarms associated with the system.)

Higher National Unit specification: statement of standards (cont)

Unit title: Marine Cargo Operations

- ◆ Explain the procedures to be adopted during cargo operations, for one from the following sample:
 - (a) Crude oil cargoes
 - (b) Multi grade cargoes
 - (c) Gas cargoes
 - (d) Bulk chemical cargoes
- ◆ Perform basic cargo calculations

Where sampling is used a different sample should be used on each assessment occasion.

Assessment guidelines

Outcome 2 may be assessed by means of a closed-book assessment under supervised conditions consisting of short answer questions. Outcomes 1 - 4 may be combined for assessment purposes.

Outcome 3

Explain the duties of the Officer of the Watch (OOW) whilst maintaining a deck cargo watch

Knowledge and/or skills

- ◆ Safety procedures
- ◆ Security
- ◆ Code of safe working practices
- ◆ Emergency response
- ◆ Pollution prevention
- ◆ Safe access
- ◆ Cargo handling equipment
- ◆ Cargo documentation

Evidence Requirements

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

- ◆ Explain from a sample of two of the following:
 - (a) the safety and security procedures to be observed when carrying out a deck watch
 - (b) the legislative requirements regarding safe access to the vessel
 - (c) the use and maintenance of cargo handling equipment
 - (d) the legislative requirements regarding cargo documentation and record keeping

Higher National Unit specification: statement of standards (cont)

Unit title: Marine Cargo Operations

- ◆ Explain the initial and subsequent actions for a sample of one of the following emergency situations which may arise during a cargo watch:
 - (a) Fire
 - (b) Cargo equipment emergencies
 - (c) Pollution emergencies
 - (d) Emergencies involving dangerous goods

Where sampling is used a different sample must be used on each assessment occasion.

Assessment guidelines

Outcome 3 may be assessed by means of a closed-book assessment under supervised conditions consisting of a mixture of short answer and structured questions. Outcomes 1 – 4 may be combined for assessment purposes.

Outcome 4

Explain the precautions and procedures to be taken to prevent pollution of the marine environment

Knowledge and/or skills

- ◆ International Convention for the Prevention of Pollution from Ships (MARPOL)
- ◆ Shipboard Marine Pollution Emergency Plans (SMPEP)
- ◆ Hazardous Goods
- ◆ Bunkering operations

Evidence Requirements

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

- ◆ Explain for a sample of one of the following:
 - (a) the requirements of the MARPOL Convention and current legislation with respect to preventing pollution of the marine environment
 - (b) pro-active and re-active policies with respect to marine pollution
- ◆ Explain the precautions and procedures to prevent pollution of the marine environment for a sample of one of the following:
 - (a) Routine vessel operations
 - (b) Bunkering
 - (c) Carriage of hazardous substances on board
 - (d) Garbage and tank residue disposal

Where sampling is used a different sample must be used on each assessment occasion.

Higher National Unit specification: statement of standards (cont)

Unit title: Marine Cargo Operations

Assessment guidelines

Outcome 4 may be assessed by means of a closed-book assessment under supervised conditions consisting of a mixture of short answer and structured questions. Outcomes 1–4 may be combined for assessment purposes.

Administrative Information

Unit code: F0LM 34

Unit title: Marine Cargo Operations

Superclass category: ZF

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Version	Description of change	Date

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Higher National Unit specification: support notes

Unit title: Marine Cargo Operations

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

This Unit introduces candidates to the handling of the various categories of cargoes transported by sea. It is designed to enable candidates to obtain the required underpinning knowledge of the subject to enable them to become competent in the role as a Deck Officer on board Merchant Vessels.

In Outcome 1, candidates are introduced to the general principles of cargo handling at operational level. This will allow candidates to build on the practical aspects that they will have previously been exposed to whilst serving on board Merchant Vessels. The Unit introduces the statutes and international regulations which govern the carriage of goods at sea in addition to providing an in-depth knowledge of systems of management which are aimed at safe cargo handling. Candidates are required to undertake calculations aimed at the allocation of space on board a vessel for items or parcels of cargo. This is closely aligned to the HN Unit F0LD 34 Ship Stability: An Introduction and certain Outcomes of which could be delivered simultaneously with this Outcome.

Outcome 2 investigates the carriage of liquefied Oil, Gas and Chemical cargoes in bulk. Systems and procedures for the loading, carriage and discharge of these cargoes are covered with a high emphasis on safety, including the use of Inert Gas Systems. Candidates will understand the operation of instrumentation used to detect gases in compartments along with quantities of cargo present in tanks. Pollution control and prevention is included within this Unit.

Outcome 3 is aimed at preparing candidates for their chosen career as a Deck Officer by detailing the duties of the Officer of the Watch (OOW) during cargo operations. This includes certain activities and duties which do not directly concern the handling of cargo, such as security; effects of tide whilst alongside a berth; effects of other vessels passing close alongside in confined waters; safe access to the vessel. This builds on the prior experiential learning gained by candidates whilst serving on board ship.

Outcome 4 concerns the procedures required to be followed by international legislation to prevent pollution of the sea and air by eliminating and reducing all emissions from the vessel. The contents of the International Convention for the Prevention of Pollution from Ships (MARPOL) are studied in depth to underpin the required knowledge of the legal requirements. The operation of the vessel is studied with emphasis on all aspects of the carriage of toxic and pollutant commodities in bulk; disposal of used ballast water; garbage control; acceptable levels of noise and emissions from the vessel.

Higher National Unit specification: support notes (cont)

Unit title: Marine Cargo Operations

Guidance on the delivery and assessment of this Unit

When undertaking this Unit it is expected that candidates will have prior knowledge of cargo operations. Such knowledge will have been gained from practical experience of carrying cargoes on board vessels.

Assessment will be on a sample basis. Outcomes 1, 2, 3 and 4, which may be combined for assessment purposes, will be assessed by a mixture of short answer and structured response questions under supervised conditions.

Opportunities for developing Core Skills

There are opportunities to develop the following Core Skills in this Unit.

Communication, across the range, at SCQF level 5. This can be achieved by candidates having to read legislation and codes contained within statutory instruments and producing written evidence based on the above which will be required to be presented in a clear and logical manner.

Oral communication can be developed within the classroom session by use of interactive questioning aimed to allow candidates to share their knowledge of particular types of cargoes with other candidates who may have had no experience of carrying them.

Numeracy can be developed at SCQF level 4 by candidates carrying out simple cargo calculations and using tabular and graphical information, commonly found on board ships to obtain information required in the calculation.

Using Information Technology at SCQF level 5 can be developed by candidates using the internet to access resources and also by candidates being shown the operation of state of the art cargo handling simulators.

Problem Solving across the range, at SCQF level 6, may be developed by having candidates prepare cargo plans, from information supplied, such as type of cargo quantity to be loaded, and port of loading and discharge, to ensure that the cargo operation proceeds in a smooth and efficient manner. This requires the candidates to consider numerous variables such as dangerous goods legislation, stability criteria, etc. Candidates may also be asked to review and evaluate changes to the plan to meet operational requirements, eg a change in the port rotation order, a delay on arrival or departure, failure of critical cargo handling equipment.

Working with Others at SCQF level 6, can be developed by using group work within the classroom setting this allows candidates to share experiences which other candidates may not have had depending on the type of vessels they have been sailing on. For example a candidate who has knowledge of container operations may work with a group of candidates who only have tanker experience and vice-versa.

The group will have to collaborate to get the most out of the experience and decide how best to use this expertise to the benefit of all.

Higher National Unit specification: support notes (cont)

Unit title: Marine Cargo Operations

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: Marine Cargo Operations

This Unit is designed to enable you to gain sufficient knowledge which will enable you to become a valued member of a vessel's Deck Officer complement. The content of this Unit is assessed within the centre at which you choose to study and you will undergo further assessment on the topics during your MCA Oral examination at the end of your course of studies. You are strongly advised during your study of the Unit to use any relevant work experience that you may have in the subject.

The Unit is divided into four main subject areas, each one of which is the subject of a separate Outcome. Each of these Outcomes contains elements which build on the prior experiential learning which you will have gained whilst serving on board ship.

- ◆ In Outcome 1, you will be introduced to the general principles of cargo handling at operational level. The Unit introduces the statutes and international regulations which govern the carriage of goods at sea in addition to providing an in-depth knowledge of systems of management which are aimed at safe cargo handling. You will be required to undertake calculations aimed at the allocation of space on board a vessel for items or parcels of cargo. This is closely aligned to the Unit entitled Ship Stability 1 which you may also study as part of the Group Award.
- ◆ Outcome 2 investigates the carriage of liquid cargoes and liquefied gas in bulk. Systems of loading, carriage and discharge are covered, with a high emphasis on safety, including the use of Inert Gas Systems. You will understand the operation of instrumentation used to detect gases in compartments along with quantities of cargo present in tanks. Pollution control and prevention is included within this Unit.
- ◆ Outcome 3 is aimed at preparing you for your chosen career as a Deck Officer by detailing the duties of the OOW during cargo operations. This includes certain activities and duties which do not directly concern the handling of cargo, such as security; effects of tide whilst alongside a berth; effects of other vessels passing close alongside in confined waters; safe access to the vessel.
- ◆ Outcome 4 concerns the procedures required to be followed by international legislation to prevent pollution of the sea and air by eliminating and reducing all emissions from the vessel. The contents of the IMO Publication entitled MARPOL are studied in depth to underpin the required knowledge of the legal requirements. The operation of the vessel is studied with emphasis on all aspects of the carriage of toxic and pollutant commodities in bulk; disposal of used ballast water; garbage control; acceptable levels of noise and emissions from the vessel.

You may be assessed by a single assessment event which takes place under closed book supervised conditions and assesses Outcomes 1–4.