

SQA Advanced Unit Specification

General information

Unit title: Management of Vessel Operations (SCQF level 8)

Unit code: HW7C 48

Superclass: ZS

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Version: 01

Unit purpose

This unit is about the planning and operational procedures for the safe stowage and securing of dry cargoes and the safe handling of oil, gas and chemical cargoes. It is also about the planning and operational procedures for passenger operations. It is primarily aimed at learners who intend to seek sea-going employment as a Merchant Navy Deck Officer. However it could also be studied by someone with an interest in the subject area.

Outcomes

On successful completion of the unit the learner will be able to:

- 1 Analyse and plan cargo operations for dry cargoes, including loading, discharging, securing and cargo handling equipment and safe operating procedures.
- 2 Analyse and plan cargo operations for bulk liquid cargoes, including loading, discharging and cargo handling equipment and safe operating procedures.
- 3 Analyse the planning and operational procedures for passenger operations.
- 4 Calculate cargo quantity within the constraints of prevailing legislations and contact of carriage.

Credit points and level

2 SQA Credits at SCQF level 8: (16 SCQF credit points at SCQF level 8)

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Recommended entry to the unit

Access to this unit is at the discretion of the centre. However learners would benefit most from this unit if they have successfully completed the following SQA Advanced Units *Marine Cargo Operations*, *Marine Law and Management*, *Ship Stability: An Introduction*.

Core Skills

Achievement of this unit gives automatic certification of the following Core Skill components:

Complete Core Skill	None
Core Skill component	Planning and Organising at SCQF level 6 Critical Thinking at SCQF level 6 Using Number at SCQF level 5

There are also opportunities to develop aspects of Core Skills which are highlighted in the support notes of this unit specification.

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.

Equality and inclusion

This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

SQA Advanced Unit Specification: Statement of standards

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Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

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. Learners 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

Analyse and plan cargo operations for dry cargoes, including loading, discharging, securing and cargo handling equipment and safe operating procedures.

Knowledge and/or skills

- ◆ Dry cargo operations and legislative requirements
- ◆ Cargo operation management and control
- ◆ Cargo stowage and securing legislation
- ◆ Cargo handling equipment

Outcome 2

Analyse and plan cargo operations for bulk liquid cargoes, including loading, discharging and cargo handling equipment and safe operating procedures.

Knowledge and/or skills

- ◆ Liquid cargo operations and legislative requirements
- ◆ Liquid cargo operation management and control

Outcome 3

Analyse the planning and operational procedures for passenger operations.

Knowledge and/or skills

- ◆ Passenger operations to meet legislative requirements
- ◆ Passenger operations: control and monitoring

Outcome 4

Calculate cargo quantity within the constraints of prevailing legislations and contact of carriage.

Knowledge and/or skills

- ◆ Loadline zone calculation
- ◆ Quantity on board (bulk liquid calculations)
- ◆ Quantity to load to fill the hold using stowage factor and broken stowage
- ◆ Draught surveys

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Evidence requirements for this unit

Learners are required to provide written and/or oral evidence in supervised open-book conditions using centre provided, Maritime and Coastguard Agency (MCA) approved data sheets, ship's plans to demonstrate their knowledge and/or skills across all outcomes.

Outcomes 1, 2, 3 and 4 may be assessed by means of a single unseen open-book assessment in supervised conditions using MCA approved data sheets and ship's plans consisting of a mixture of loading/discharge operation plans and calculations.

Outcome 1

For Outcome 1 a minimum of two out of six knowledge and skills should be sampled. A different sample should be used on each assessment occasion.

Learners are required to provide written and/or oral recorded evidence to demonstrate their knowledge and/or skills by showing they can:

- 1 Organise the on board preparation to ensure that the cargo operations comply with respective legislation and codes for a sample of one from the following types of cargo:
 - (a) Solid bulk including grain
 - (b) Refrigerated cargoes
 - (c) General cargoes
 - (d) Deck cargoes
 - (e) Unitised cargoes
- 2 Identify the information that must be given by the shipper to the vessel prior to loading a cargo for a sample of one from the following:
 - (a) General cargoes
 - (b) Bulk cargoes
 - (c) Dangerous goods
- 3 Analyse the hazards associated with the cargo and the means adopted to minimise the risks associated with these hazards for a sample of one from the following:
 - (a) Solid bulk cargoes
 - (b) Timber deck cargoes
 - (c) Heavy lifts
 - (d) Dangerous goods
- 4 Identify the procedures that may be adopted to deal with a sample of one from the following:
 - (a) Cargo loading out of synchronisation with the plan
 - (b) Fire/spill or medical emergency involving dangerous goods
 - (c) Damaged cargo

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- 5 Analyse the requirements to ensure cargo is secured effectively for a sample of one from the following:
 - (a) Grain cargoes
 - (b) Timber deck cargoes
 - (c) Cargo securing manual
- 6 Formulate procedures to ensure that all cargo handling equipment is maintained effectively in compliance with current legislation.

Outcome 2

For Outcome 2 a minimum of two out of three knowledge and skills should be sampled. A different sample should be used on each assessment occasion.

Learners are required to provide written and/or oral recorded evidence to demonstrate their knowledge and/or skills by showing they can:

- 1 Organise the on board preparation to ensure that the cargo operations comply with respective legislation and codes for a sample of one from the following types of cargo:
 - (a) Petroleum cargoes
 - (b) Liquefied gas cargoes
 - (c) Bulk liquid chemical cargoes
- 2 Manage the cargo operation to minimise the effect of the hazards on the vessel, environment and personnel for a sample of one from the following:
 - (a) Petroleum cargoes
 - (b) Liquefied gas cargoes
 - (c) Bulk liquid chemical cargoes
- 3 Manage the cargo operation to minimise the effect of a pollution incident involving a sample of one from the following:
 - (a) Petroleum cargoes
 - (b) Bulk liquid chemical cargoes

Outcome 3

For Outcome 3 a minimum of two out of five knowledge and skills should be sampled. A different sample should be used on each assessment occasion.

Learners are required to provide written and/or oral recorded evidence to demonstrate their knowledge and/or skills by showing they can:

- 1 Evaluate the boarding arrangements (including security measures) used in passenger operations.
- 2 Outline the emergency information for passengers.

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- 3 Analyse and explain the requirements for passenger and crew drills and training.
- 4 Outline the procedures that may be adopted when there is a death of a passenger on board.
- 5 Analyse how emergency situations may be dealt with on board.

Outcome 4

- 1 Determine cargo calculations from a sample of one from the following:
 - (a) Calculate the maximum amount of cargo to load to comply with loadline zone requirements
 - (b) Calculate the actual amount of bulk liquid cargo on board a vessel
 - (c) Calculate the amount of cargo required to fill a hold, utilising the stowage factor of the cargo and a given value for broken stowage
 - (d) Perform calculations involving draught survey data

SQA Advanced Unit support notes

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Unit support notes are offered as guidance and are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 80 hours.

Guidance on the content and context for this unit

The content of this unit forms part of the underpinning knowledge for a UK MCA Chief Mate Certificate of Competency and accordingly reflects the content of International Maritime Organisation's Standards of Training Certification and Watchkeeping (STCW).

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

Outcome 1

This outcome introduces learners to the carriage and handling of dry cargoes, including dry bulk cargoes. Learners will learn about the characteristics of these cargoes and the legislation covering their carriage. The outcome also considers the stowage and securing of cargoes, including deck and timber cargoes.

The hazards associated with the carriage of certain cargoes will be discussed and the procedures required to ensure their safe carriage analysed. The different types of equipment for safe handling of cargo will be examined and their effectiveness evaluated.

Requirements for the carriage of dangerous goods are also considered.

Outcome 2

This outcome deals with the carriage of liquids and chemicals in bulk and considers the hazards posed by such cargoes to the crew and environment. The legislative requirements to ensure these cargoes are loaded, carried and discharged safely will be considered and the various codes examined.

Routine and emergency procedures to deal with the carriage of these cargoes will be discussed and the preparations prior to loading or discharging analysed at length.

Outcome 3

This outcome introduces learners to passenger operations from the point of view of control and documentation required, plus additional training and safeguards which will be necessary, particularly from the point of view of security.

Outcome 4

This outcome covers the differing types of cargo calculations that a senior officer may be required to undertake, to determine the cargo on board, the cargo that can be loaded and the maximum cargo uplift possible to remain within the criteria of the loadline rules.

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Guidance on approaches to delivery of this unit

The unit is primarily intended for learners who are new entrants to the Merchant Navy via one of the Merchant Navy Training Board (MNTB) approved deck cadet training schemes who have already completed the SQA Advanced Certificate in Nautical Science award or are appearing for a Chief Mate Certificate of Competency who already hold an Officer of the Watch Certificate of Competency.

Ideally learners would have already accrued some shipboard experience prior to attempting this unit, although this is not a prerequisite.

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 Management level aboard ship.

Completion of the unit will also ensure that the learner complies with all the requirements laid down by the UK MCA for the issue of a Chief Mate 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 (C&D), which is available from the MNTB.

Learners will benefit most if this unit is delivered in conjunction with the following units: *Shipmaster's Business*, *Ship Stability: Theory and Practical Application* and *Marine Vessels: Structures and Maintenance*. They should also be able to draw on the knowledge gained from the qualifications or units recommended as prior knowledge as well as experience gained from service at sea.

Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Outcomes 1, 2, 3 and 4 may be assessed by means of a single unseen open-book assessment using MCA approved data sheets and ship's plans under open-book supervised conditions consisting of a mixture of loading/ discharge operation plans and calculations.

Centres may choose to assess the learners using a combination of course work on Outcome 1 or 2 and 4 by means of course work involving planning the cargo operations of loading/discharging operations using ship loading computer software and a 90-minute open-book assessment by sampling Outcome 3 and Outcome 2 or 1 as the case may be.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the evidence requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

Opportunities for developing Core and other essential skills

This unit has the Using Number component of Numeracy embedded in it. This means that when learners achieve the unit, their Core Skills profile will also be updated to show they have achieved Using Number at SCQF level 5.

This unit also has the Critical Thinking and Planning and Organising components of Problem Solving embedded in it. This means that when learners achieve the unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.

There are further opportunities for developing all three elements of the Core Skill *Communication* at SCQF level 5 or 6.

This can be achieved through learners having to read complex legislation and codes and then summarising these in assessments. Oral Communication can be encouraged by getting learners to discuss their own experience of cargo types within the classroom setting. This is extremely beneficial to learners who may never have sailed on a particular type of vessel.

History of changes to unit

Version	Description of change	Date

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SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of SQA Advanced Qualifications.

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General information for learners

Unit title: Management of Vessel Operations (SCQF level 8)

This section will help you decide whether this is the unit for you by explaining what the unit is about, what you should know or be able to do before you start, what you will need to do during the unit and opportunities for further learning and employment.

The purpose of this unit is to build on the knowledge and skills gained in the earlier SQA Advanced Unit *Marine Cargo Operations*.

It introduces you to the concept of planning cargo operations and controlling sequence of loading and discharging. It also introduces the main legislation concerning differing types of cargo and the implications for their safe and effective carriage.

You will become familiar with the hazards of certain types of cargoes and the procedures that must be adopted to take account of these, for example chemical cargoes. The principles and use of safety equipment carried on board to deal with these hazards will be explained.

Cargo documentation will be explained in depth and the role of the senior officer in ensuring that cargo is loaded correctly with regard to risk, temperature requirements, discharge port, stability considerations and prevention of pollution discussed at length.

You will become familiar with various types of cargo handling equipment and modes of loading and discharging. The maintenance requirements for the above will be considered in terms of current legislation.

The care and handling of passengers and the implications of safety and security and control in case of emergency will be examined.

You will also study various types of cargo calculations which are commonly found on board ship. Some of these calculations are similar to those carried out in the unit *Ship Stability: Theory and Practical Application*. The procedures for carrying out draught surveys will be discussed and the calculation procedure demonstrated.

All four outcomes may be combined and assessed under open-book supervised conditions, consisting of a mixture of short answer and structured questions.

This unit has the Using Number component of Numeracy embedded in it. This means that when you achieve the unit, your Core Skills profile will also be updated to show you have achieved Using Number at SCQF level 5.

This unit also has the Critical Thinking and Planning and Organising components of Problem Solving embedded in it. This means that when you achieve the unit, your Core Skills profile will also be updated to show you have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.

There are opportunities to develop the Core Skills of *Communication* and *ICT* using verbal, non-verbal communications and using computer software at SCQF level 6. This can be achieved by you demonstrating your ability to create sensible arguments and conclusions using non-verbal communication skills, and application of ICT skills involving loading/ discharging a ship. You will require a good knowledge of English language.