

Higher National Graded Unit Specification

General Information for Centres

This Graded Unit has been validated as part of the HND Nautical Science. Centres are required to develop the assessment instrument in accordance with this validated specification. Centres wishing to use another type of Graded Unit or assessment instrument are required to submit proposals detailing the justification for change for validation.

Graded Unit Title: Nautical Science: Graded Unit 3

Graded Unit Code: F13D 35

Type of Graded Unit: Examination

Assessment Instrument: Examination

Credit points and level: 1 HN Credit at SCQF level 8: (8 SCQF credit points at SCQF level 8*)

**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.*

Purpose: This Graded Unit is designed to provide evidence that the candidate has achieved the following principal aims of the HND Nautical Science:

The main aim and objective of the HND Nautical Science is to provide a candidate with the underpinning knowledge for both the SVQs in Merchant Vessel Operations and UK Maritime and Coastguard Agency Deck Officer Certificates of Competency. This Graded Unit aims to ensure that a candidate can draw together the information gained from the HN Units listed below with respect to the management of operational aspects of a Merchant Vessel and both analyse and process it at a level appropriate for the 'Chief Mate' Unlimited Certificate of Competency. In particular the following aims are covered.

- ◆ Develops the skills required to manage and control the safe navigation of the vessel in all conditions.
- ◆ Develops the skills required to manage and control vessel operations in compliance with current legislation.
- ◆ Develops a sound understanding of shipboard management issues and techniques.
- ◆ Develops a sound understanding of the ship Master's role with respect to the legal aspects of managing the navigation and operation of the vessel.
- ◆ Develops an understanding of the vessel's propulsion maintenance and engineering requirements.
- ◆ Prepares candidates for the MCA written and Oral examinations.

Recommended Prior Knowledge and Skills: It is recommended that the candidate should have completed or be in the process of completing the following Units relating to these specific aims prior to undertaking this Graded Unit:

F0LC 35 *Ship Stability: Theory and Practical Application*

F0LX 35 *Management of Vessel Operations*

F0LN 35 *Shipmaster's Business*

General Information for Centres (cont)

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

Communication: Reading	SCQF level 6
Communication: Written	SCQF level 6
Numeracy: Using Number	SCQF level 6
Numeracy: Graphical Information	SCQF level 6
Problem Solving: Critical Thinking	SCQF level 6
Problem Solving: Planning and Organising	SCQF level 6
Problem Solving: Reviewing and Evaluating	SCQF level 6

although there is no automatic certification of Core Skills within the Unit.

Assessment: This examination-based Graded Unit is open-book. It will consist of a written examination of three hours.

Administrative Information

Graded Unit Code: F13D 35

Graded Unit Title: Nautical Science: Graded Unit 3

Original date of publication: August 2006

Version: 01

History of Changes:

Version	Description of change	Date

Source: SQA

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Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates

Graded Unit Title: Nautical Science: Graded Unit 3

Conditions of Assessment

The assessment is based on an **open-book** examination lasting three hours.

If a candidate does not achieve a pass or if a candidate wishes to upgrade, this must be based on a significantly different examination from that given originally. A candidate's grade will be based on his/her achievement on the new event using a significantly different examination.

The examination should be unseen and the assessment should be conducted in controlled and supervised conditions.

At all times, the security, integrity and confidentiality of examinations must be ensured.

The assessment could be based on an examination paper consisting of a practical ship loading problem, involving the candidates solving problems covering the following HN Units:

Ship Stability: Theory and Practical Application
Management of Vessel Operations
Shipmaster's Business

Candidates will require access to MCA approved data tables and approved formulae sheets as listed below.

The candidate will be expected to answer examination questions without the aid of reference and/or source materials with the exception of marine publications and data sheets readily available on board ships as listed below and as specifically indicated for each assessment. Candidates are also permitted to use only non programmable calculators.

List of Permitted Publications:

Nautical Tables
MCA Approved Extracts from the Nautical Almanac
MCA Approved Extracts from Admiralty Tide Tables
MCA Approved formulae sheets
Navigational Charts/Chartlets
Weather Charts
Compass Deviation Cards
Radar Plotting Sheets
Co Tidal/Co Range Diagrams
Ships Manoeuvring Data Sheet
MCA Approved Trim and Stability Data Sheets

Instructions for designing the assessment task:

The examination should be designed to assess the candidate's critical knowledge and understanding of the topics relating to the specific aims which this Graded Unit is designed to cover. The questions and corresponding marks should be designed in accordance with the ranges indicated in the table that follows. However, the overall total mark for the examination is 100.

Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates (cont)

Key Topics	Level of demand	Percentage weighting for each topic
Maritime Conventions	Recall.	5%
Applications of commercial law to shipping operations.	Evaluate.	15%
Cargo Handling (Could include analysis of cargo safety measures and calculation of stowage information, ullages, etc.)	Analysis and Calculation.	20%
Port Operations (Could include the planning requirements for loading/discharging bulk liquid/solid cargoes, passenger movement control procedures and analysis of cargo/hold test results.)	Analysis and Planning.	20%
Ship Stability (Could include calculation of: loading details, free-surface effects, ice accretion, wind heeling moments. Analysis or evaluation of damage stability information with concluding recommendations.)	Calculation, Analysis, Evaluation and Conclusion.	40%

The examination will be marked out of 100. Assessors will aggregate the marks achieved by the candidate to arrive at an overall mark for the examination. Assessors will then assign a grade to the candidate for this Graded Unit based on the following grade boundaries:

- ◆ A = 70% — 100%
- ◆ B = 60% — 69%
- ◆ C = 50% — 59%

Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates (cont)

Candidates who meet the minimum Evidence Requirements will have their achievement graded as a C (competent), A (highly competent), or B (somewhere between A and C). The grade related criteria to be used to judge candidate performance for this Graded Unit is specified in the following table:

Grade A	Grade C
<p>Is a seamless, coherent piece of work or exam script which consistently:</p> <ul style="list-style-type: none"> ◆ Demonstrates a depth of understanding of current national, international legislation and conventions applicable to merchant vessel. ◆ Provides evidence of sound knowledge of calculation procedures involving cargo operations. ◆ Demonstrates understanding of the procedures involved in the loading, discharging and care of cargoes. There will be references to the applicable regulations and conventions contained within the solution. ◆ Exemplifies clear and accurate working of stability problems, with diagrams where appropriate, to provide the assessor with additional evidence of a candidate's understanding and ability to analyse data. 	<p>Is a co-ordinated piece of work or exam script which:</p> <ul style="list-style-type: none"> ◆ Provides evidence that a candidate is aware of current national, international legislation and conventions applicable to merchant vessel. ◆ Demonstrates that candidates can perform cargo calculations. ◆ Provides evidence that the candidate is aware of accepted procedures for cargo operations. ◆ Demonstrates that stability problems can be analysed and calculations performed accurately.

Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates (cont)

Support Notes

The paper should be designed to thoroughly test the candidate's ability to carry out the duties of the Chief Mate whilst in charge of loading or discharging or caring for cargo on a voyage.

The examination should be conducted under open-book, supervised conditions, similar to those required for the Maritime and Coastguard Agency (MCA) written examinations at Officer of the Watch level.

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

Communication: Written, Reading at SCQF level 6 can be developed by candidates having to read through complex legislation and summarising this in assessment responses.

Numeracy: Using Number, Using Graphical Information at SCQF level 6 can be developed by candidates having to perform calculations involving a number of interrelated variables and by using the results to produce graphical solutions to subsequent problems.

Problem Solving across the range at SCQF level 6 can be developed by structuring questions such that candidates will have to consider how much of the supplied information is absolutely necessary to the solution. Candidates will have to select and apply the relevant information and reject information which is not material to the solution. Candidates will also have to plan for loading/discharging cargoes and may be asked to evaluate calculated solutions with respect to internationally accepted 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 special alternative assessment arrangements. 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

This Graded Unit is designed to ensure that you can draw together the knowledge and skills across the range of HN Nautical Science Units that are sampled in the assessment.

The format of the assessment is an open-book examination in which you will have access to MCA approved data and formulae sheets. Programmable calculators will not be permitted in the examination.

Questions will be structured so that they are, as far as possible, relevant to the actual responsibilities which you will take on in the role of the Officer of the Watch, whilst keeping a deck watch in port, when the vessel is working cargo.

You may be required to interpret information presented in graphical format and you will be asked to produce sketches. Sketches should be clear and in the correct proportion.

In the case of calculations all working should be shown and intermediate steps should be shown. Draughts should be calculated to the nearest millimetre and angles of heel/list to a single decimal place of a degree. Weights should be accurate to the nearest tonne.