1. Navigation and ARPA Simulation (NARAS)	Page 2
2. Celestial Navigation	Page 20
3. Business and Law	Page 23
4. Stability	Page 35
5. Seamanship & Meteorology	Page 43

Navigation and ARPA Simulation (NARAS)

June 2017

Revision No;	Changes	Author	Date
7-1	Adjust title to remove reference to 500GT	BT	9-2016
7-02	Correction of Typos	BT	June 2017

Duration

This module will be conducted over a minimum period of ten days, or 60 hours, of formal instruction with a maximum of 8 hours in any one day of study.

Content

This module will contain sections on:

- Passage Planning
- the Collision Regulations,
- Radar and ARPA
- ECDIS and AIS
- Search and Rescue (IAMSAR),

Practical simulator exercises will occupy at least 30 hours use of an MCA typeapproved Radar and Navigation Systems Bridge Simulator to demonstrate competency in planning and monitoring techniques, blind pilotage, collision avoidance and Search and Rescue. The candidate must have an approved ECDIS certificate to undertake this module.

Assessment.

The assessment will be in two parts:

In-course practical assessment: Candidates MUST satisfactorily complete the incourse assessment before they are eligible to take the written exam.

The in-course assessment will consist of:

- Preparing a detailed passage plan for a passage, in estuarial or coastal waters.
- A series of simulator exercises demonstrating competence in general navigation including the use of electronic navigational aids (radar, ARPA and ECDIS) and a thorough understanding and application of the IRPCS (ColRegs).

A Written Theory 2 $\frac{1}{2}$ hour Examination.

A candidate must achieve an overall pass mark of at least 60% to pass the written examination.

Simulation and in-course Practical Assessment

Section 1: Passage Planning

Topic 1: Appraisal and planning.

- a) Identify most suitable route consult all relevant documentation.
 - i. Pilot book information: shallow patches, restricted areas, conspicuous landmasses, offshore dangers,
- b) Set courses on charts,
 - i. berth to berth,
 - ii. between points of departure and destination
 - iii. Identify and highlight dangers on the charts
- c) Current and Tidal publications:
 - i. prevailing currents and tides (heights and directions) in relevant places.
- d) Reporting areas: VTS and other communication requirements
- e) Assess and allow suitable margins of safety from dangers
- f) Sources of Weather information throughout route:
 - i. Winds,
 - ii. Potential fog,
 - iii. Ice
 - iv. Other aspects, including Tropical Revolving Storms that could restrict passage or require deviation.

Topic 2: Determine all aspects affecting navigation.

- a) Identify position fixing arrangements
- b) Identify transit bearings and other means of determining the compass error
- c) Set up parallel indexing and identify index ranges
- d) Define contingency arrangements
- e) Establish 'abort' position when approaching confined waters
- f) Identify Traffic Separation areas
- g) Identify any other special areas and restrictions, which may affect the safe navigation

Topic 3. Pre-sailing briefing.

- a) Understand the importance of pre-sailing briefing
- b) Identify information to be discussed at pre-sailing briefing.

Topic 4. Use of ECDIS with Passage Planning.

- a) Plan and save a route using ECDIS, adding text and warnings, where necessary
- b) Set appropriate alarm parameters, i.e. safety depth, safety contour, cross track error.
- c) Determine the availability of appropriate charts and their coverage.

Topic 5. Fuel consumption and range

- a) Determine total distance to travel and fuel consumption
- b) Determine safe fuel reserve required
- c) Determine fuel required at departure port.

Topic 6. Execution and monitoring.

- a) Navigation safety.
 - i. Determine course to steer to make good a desired course.
 - ii. Fix vessel's position by visual and/or radar cross check.
 - iii. Fix vessel's position by electronic navigational aids cross check.
 - iv. Monitor the vessels progress by ECDIS.
 - v. Monitor the vessel's position by parallel index with reference to the planned track in coastal and estuarial waters and port approaches.
 - vi. Maintain the vessel in a safe position.
 - vii. Execute 'contingency arrangements' in the event of steering failure, engine breakdowns, and blackouts.
 - viii.Monitor other vessels by radar/ARPA
 - ix. Comply fully with the International Regulations for Preventing Collisions at Sea.
 - x. Use information from an MKD unit or AIS/ARPA/ECDIS interface to enhance situation awareness.
 - xi. Conduct a pre-planned coastal passage in the simulator in clear and/or reduced visibility demonstrating seamanlike navigation and chartwork skills.

Topic 7. Conduct Arrival briefing.

- a) Understand the importance of arrival briefing.
- b) Identify the information to be discussed at an arrival briefing.

Section 2: International Regulations for Preventing Collisions at Sea

Topic 8. Application of the Collision Regulations - practical exercises on an approved simulator

- a) Appreciate the need for early and substantial action and dangers of assumptions made on inadequate information.
- b) Take suitable action in compliance with the Rules to avoid close quarter situations with vessels in sight of one another.
- c) Take suitable action in compliance with the Rules to avoid close quarter situations with vessels detected by radar alone, but not observed visually.
- d) Determine a safe speed taking into account all prevailing conditions
- e) Whilst conducting a simulated passage, analyse potential collision risks when in a potential multi-vessel encounter, determine and execute best action to avoid a close quarter situation.

Topic 9. Principles of search and rescue - practical application of search and Rescue Operations

- a) Understand the basic contents and use of International Aeronautical and Marine Search and Rescue (IAMSAR) Manual vol III
- b) Conduct a simulated multiple ship SAR exercise to include at least three ships
- c) Establish an OSC for an exercise clear of coastal control;
 - i. Delegate responsibilities.
 - ii. Establish a datum.
 - iii. Conduct full communications and instructions
 - iv. Initiate multiple ship search patterns.
 - v. Establish inter-ship communications to prepare for recovery.
- d) Make own ship ready for SAR operations and casualty recovery.
- e) Manoeuvre to recover survivors.
- f) Understand how the use of ECDIS can aid the search patterns.

NOTE:

The exercise should reflect the implications of GMDSS and other additional facilities available to assist SAR

Section 3: RADAR.

Topic 9. Radar display.

- a) Understand modes of operation
- b) Understand and utilise the advantages of the different display orientations
- c) Understand and utilise the advantages of the different modes of display
- d) Understand and utilise the advantages of sea and ground stabilization
- e) Appreciate and utilise target trails

Topic 10. Use of Radar in Navigation

a) Demonstrate the correct use of radar for navigation including use of Parallel Indexing.

Understand and demonstrate the use of ERBL to make controlled turns (Concentric Indexing)

Operate ARPA radar interfaced with an ECDIS.

Understand advantages and limitations of ARPA and tracked target overlay on ECDIS display.

Understand advantages and limitations of overlaying radar picture onto ECDIS.

Topic 11. Practical radar plotting.

- a) Perform paper and real-time simulator plotting of more than one target
- b) Determine effect of own ship alteration of course on CPAs of other targets.
- c) Demonstrate safe decisions based on forecast plots that fully comply with IRCPS.

Section 4: ARPA & TARGET TRACKING

Introduction

This part of the course follows the structure of the MCA approved ARPA course: it serves as refresher training for those candidates already ARPA qualified. (Note: the term ARPA includes the target tracking capabilities of newer radars)

Objectives

On successful completion of training the student will be able to use ARPA to maintain safety of navigation.

- Obtain and analyse the data provided.
- Take action as required for the safe conduct of navigation based on correct interpretation and analysis of ARPA data.
- Understand the dangers inherent in over-reliance on ARPA data;
- Understand the capabilities and limitations of the system and the factors which can affect the system's performance and accuracy

Topic 12. IMO Performance Standards for ARPA.

a) Demonstrate an appreciation of the performance standards, in particular relating to accuracy.

Topic 13. Factors affecting system performance and accuracy.

- a) Demonstrate a knowledge of ARPA sensor input parameters radar, compass and speed inputs and the effects of sensor malfunction on the accuracy of ARPA data.
- b) Demonstrate a knowledge of the effects of the limitations of radar range and bearing discrimination and accuracy and the limitations of compass and speed input accuracies on the accuracy of ARPA data.
- c) Demonstrate knowledge of the factors that influence vector accuracy.

Topic 14. Tracking capabilities and limitations.

- a) Demonstrate knowledge of the criteria for the selection of targets by automatic acquisition.
- b) Demonstrate knowledge of the factors leading to the correct choice of targets for manual acquisition.
- c) Demonstrate knowledge of the effects on tracking of lost targets and target fading.
- d) Demonstrate a knowledge of the circumstances causing 'target swap' and its effects on displayed data.
- e) Demonstrate knowledge of the limits imposed on both types of acquisition in multi-target scenarios.

Topic 15. Processing delays.

 a) Demonstrate a knowledge of the delays inherent in the display of processed ARPA information, particularly on acquisition and re-acquisition or when a tracked target, or own ship, manoeuvres.

Topic 16. Operational warnings

- a) Demonstrate the uses, benefits and limitations of ARPA operational warnings and their correct setting, where applicable, to avoid spurious alarms and distraction.
- b) Demonstrate an appreciation of true and relative vectors and typical graphic representation of target information and danger areas.
- c) Demonstrate knowledge of true and relative vectors, derivation of targets' true courses and speeds, including:
 - i. Threat assessment.
 - ii. Derivation of predicted closest point of approach and predicted time to closest point of approach from forward extrapolation of vectors.
 - iii. The effects of alteration of course and/or speed of own ship and/or targets on predicted closest point of approach and predicted time to closest point of approach and danger areas.
 - iv. The effects of incorrect vectors.
 - v. The benefits of switching between true and relative vectors.

Topic 17. Information on past positions of targets being tracked.

- a) Demonstrate a knowledge of the derivation of past positions of targets being tracked
- b) Recognise historic data as a means of indicating recent manoeuvring of targets
- c) Demonstrate setting up and maintaining displays.
- d) Demonstrate:
 - i. The selection of display presentation; stabilised relative motion displays and true motion displays
 - ii. The correct adjustment of all variable radar display controls for optimum display of data
 - iii. The selection as appropriate of required speed input
 - iv. The selection of ARPA tracking controls, manual and automatic acquisition, vector display of data
 - v. The selection of the time scale of vectors
 - vi. The use of exclusion areas when automatic acquisition is utilised
 - vii. Performance checks of radar compass and speed input sensors and ARPA.

Topic 18. Obtaining information from the ARPA display.

- a) Demonstrate an ability to obtain information in both relative and true modes of display, including:
 - i. The identification of critical echoes
 - ii. The speed and direction of target's relative movement
 - iii. The time to and predicted range of target's closest point of approach
 - iv. The courses and speeds of targets
 - v. Detecting changes of targets' courses and speeds and the limitations of such information
 - vi. The effect of changes in own ship's course or speed or both
 - vii. The operation of the trial manoeuvre

Topic 19. Application of the International Regulations for Preventing Collision at Sea

a) Demonstrate an ability to analyse potential collision situations from displayed information, determine and execute action to avoid close quarters situations in accordance with the International Regulations for Preventing Collision at Sea.

Topic 20. Interfacing ARPA with other systems.

- a) Demonstrates an understanding of the ability to integrate data between navigational aids and their limitations. (ARPA/RADAR, ECDIS and AIS).
- b) Demonstrates an appreciation of the dangers and limitations of data transfer between equipment.

Section 5: ECDIS (Electronic Chart Display and Information Systems)

Topic 21. Knowledge of and ability to use ECDIS.

- a) Demonstrate an understanding of the operational difference between ECS & ECDIS.
- b) Demonstrate an understanding of the principal types of electronic charts available.
 - i. Raster charts.
 - ii. Vector charts.
- c) Be aware of S-52 & S-57 IHO performance standards.
- d) Demonstrate an understanding of the significance of ENCs and their use with ECDIS.
- e) Create a voyage plan using ECDIS.
- f) Apply appropriate safety settings.
- g) Execute a safety check on the voyage plan.
- h) Control of navigational functions and settings.
- i) Manage specific functions of route monitoring.
- j) Demonstrate an understanding of status indications, indicators and alarms
- k) Manage Radar, ARPA and AIS overlays.

- I) Monitor integrity of the system.
- m) Demonstrate an understanding of the dangers of over reliance on ECDIS.
- n) Knowledge of procurement, licensing and updating procedures.
- o) Knowledge of the voyage log requirements and procedures.

Section 6: AIS (Automatic Identification System)

Topic 22. Is aware of the uses and limitations of AIS.

- a) Demonstrate an understanding of the objectives of AIS.
- b) Aware of the SOTDMA.
- c) Demonstrate an understanding of the elements of AIS data:
 - i. Understands the information included in static data.
 - ii. Understands the information included in dynamic data.
 - iii. Understands the information included in voyage related data.
 - iv. Understands the associated transmission intervals for each group of data.
- d) Demonstrate an understanding of the use of safety and security related messages.
- e) Aware of the use of AIS as aids to navigation.
- f) AIS Ship Installations.
 - i. Understands carriage requirements.
 - ii. Understands the MKD configuration.
 - iii. Understands the radar/ECDIS configuration.
 - iv. Use of AIS at Sea.
- g) Demonstrate an understanding of the need for checks of own ship input data.
- h) Demonstrate an understanding of the use of AIS data on a radar or ECDIS display.
- i) Demonstrate caution when making decisions based on AIS target data.
- j) Demonstrate an understanding of the advantages and disadvantages of AIS compared with radar.
- k) Demonstrate an understanding of the principles and use of target identification.

3. Examination Syllabus

Duration

The theory of Navigation, Passage Planning, Radar, ARPA and ECDIS, Electronic Navigation Aids and Search and Rescue will be delivered with the practical syllabus and should cover at least 30 hours of formal training.

Assessment

The theory will be assessed by a written examination at the end of the second week of the course. Entry to the written examination requires Candidates to have passed the in course practical assessment.

The written examination will consist of a 2 $\frac{1}{2}$ hour theory paper overall pass mark of 60%.

Content

The syllabus is divided into 5 sections and 13 Topics.

Section 1: PASSAGE PLANNING

Topic 1. Appraisal, planning, execution and monitoring.

Topic 2. Atlantic and European tides.

Topic 3. Pacific Tides.

Section 2: RADAR, ARPA and ECDIS

Topic 4. Use of Radar, ARPA and ECDIS in Navigation.

Topic 5. Practical radar plotting.

Section 3: SEARCH & RESCUE

Topic 6. Principles of search and rescue.

Topic 7. Practical search and rescue operations.

Section 4: Electronic Position Fixing and Information Systems

Topic 8. Terrestrial electronic navigation systems.

Topic 9. Is aware of the uses and limitations of AIS.

Section 5: Ocean Navigation

Topic 10: Navigation of a vessel in ice.

Topic 11: Ocean Sailing.

Topic 12: Ocean Routing.

Section 1: Passage Planning

Topic 1. Appraisal, Planning Execution and Monitoring.

- a) Can describe the appraisal process.
- b) Can list the publications needed to undertake an appraisal on a chosen voyage.
- c) Can state that appraisal includes
 - i. Adequate and appropriately qualified crew.
 - ii. All certification in date.
 - iii. Sufficient Fuel, Food, Water and spares for the voyage.
- d) Can calculate fuel consumption and adequate reserves for the proposed voyage.
- e) Can describe the planning process.
- f) Can describe the execution process.
- g) Can describe the purpose of monitoring.
- h) Can produce a short passage plan for a voyage using relevant publications and data.

Topic 2. Atlantic and European Tides

- a) Can describe the relationship between chart datum, LAT, MHWS, MLWS and HAT;
- b) Can state the information contained in the Admiralty Tide Tables;
- c) Can calculate height and range of tide for standard and secondary European ports using the method in the Admiralty Tide Tables;
- d) Can calculate the height of tide for a given time at standard and secondary European ports using the method in the Admiralty Tide Tables;
- e) Can calculate the time for a given height of tide at standard and secondary European ports using the Admiralty Tide Tables.

Topic 3. Pacific Tides.

- a) Can demonstrate an understanding of the use of Pacific tide tables.
- b) Can demonstrate an understanding of differences between Pacific and Atlantic tides.

Section 2: RADAR, ARPA and ECDIS.

Topic 4. Use of Radar, ARPA and ECDIS in Navigation

- a) Can state the advantages and limitations of ARPA or Target Tracking Radar overlay on ECDIS display.
- b) Can describe the advantages and limitations of overlaying radar picture onto ECDIS.
- c) Can state that navigational data can be transferred between navigational aids (ARPA/RADAR, ECDIS, GNSS, Depth sounder, Compass and AIS).
- d) Can describe the dangers and limitations of data transfer between navigational equipment.
- e) Can describe true and relative vectors and typical graphic representation of target information and danger areas used in ARPA, ECDIS and AIS.
- f) Can state the ARPA performance standards in particular the standards relating to accuracy.
- g) Can state the operational difference between ECS & ECDIS.
- h) Can state the principal types of approved electronic charts available.
- i) Can describe the S-52 & S-57 IHO performance standards.
- j) Can identify symbols used on approved ECDIS charts as published by the Admiralty Quick Guide to ENC Symbols.
- k) Can describe the significance of ENCs and their use with ECDIS.
- Can list the status indications, indicators and alarms of ECDIS as listed in IMO Res MSC 232(82)
- m) Can execute a safety check on a voyage plan.
- n) Can describe the dangers of over reliance on ECDIS.
- c) Can describe the procurement, licensing, updating procedures for charts used in ECDIS
- p) Can describe the procedures for updating voyage log.

Topic 5. Practical Radar Plotting.

- a) Can carry out radar plotting of more than one target and deliver a detailed report.
- b) Can determine the effect of own ships alteration of course on CPAs of other targets.
- c) Can determine the effect of own ships alteration of speed on CPAs of other targets.
- d) Can determine the alteration of speed or course to maintain a CPA to other targets.
- e) Can determine earliest time of course resumption from a radar plot.
- f) Can determine the correct application of the International Rules for the Prevention of Collision to radar plotted targets in clear and restricted visibility.

Section 3: SEARCH AND RESCUE

Topic 6. Principles of search and rescue.

- a) Demonstrate an understanding of the basic contents and use of International Aeronautical and Marine Search and Rescue (IAMSAR) Manual vol III
- b) Can state the role of the OSC when clear of coastal waters.

Topic 7. Practical search and rescue operations.

- a) Can describe the use of search patterns.
- b) Can describe the tasks involved in making a ship ready for SAR operations and casualty recovery.
- c) Can describe how ECDIS can be used to aid planning in the use of search patterns.
- d) Can construct or calculate simple rendezvous situations with another vessel.

Section 4: Electronic Position Fixing and Information Systems.

Topic 8. Electronic navigation position fixing systems.

- a) Can describe the principles of terrestrial hyperbolic navigation position fixing.
- b) Can describe the principles of current satellite navigation systems.

Topic 9. The uses and limitations of AIS as an information system.

- a) Can state the objectives of AIS.
- b) Can state the purpose of SOTDMA.
- c) Can state the elements of AIS data:
 - i. static data,
 - ii. dynamic data,
 - iii. voyage related data and
 - iv. the associated transmission intervals for each group of data
- d) Can describe the use of safety and security related messages.
- e) Can describe the use of AIS as an aid to navigation.
- f) Can state the carriage requirements.
- g) Can describe the MKD and radar/ECDIS configuration.
- h) Can describe the need for checks of own ship input data.
- i) Can describe the use of AIS data on a radar or ECDIS display.
- j) Can describe the dangers of making decisions based on AIS target data.
- k) Can describe the advantages and disadvantages of AIS compared with radar.

Section 5: Ocean Navigation

Topic 10: Navigation a vessel in Ice.

- a) Can describe the dangers to navigation in areas where ice is present.
- b) Can describe the limitations to the navigation equipment in high latitudes.
- c) Can describe the precautions to be taken before and when navigating in an area where ice may be present.
- d) Can state the publications and other sources of information relevant to navigating in ice.

Topic 11: Ocean Sailing.

- a) Can define a Great Circle
- b) Can state that a great circle track is the shortest distance between two points on the earths surface.
- c) Can explain why a Great Circle track drawn on a Mercator chart will show as a curve.
- d) Can state that ECDIS can be used to calculate a great circle track, alter course positions on a great circle track and vertices of a composite great circle track.

Topic 12: Ocean Routing.

- a) Can describe the purpose and use of ocean routing charts.
- b) Can plan an ocean passage using relevant pilot book extracts.
- c) Can describe the use of the publication 'Ocean Passages for the World' in conjunction with ocean routing charts.

Celestial Navigation

June 2017

Revision No;	Changes	Author	Date
7-1	Adjust title to remove reference to 500GT	вт	9-2016

Duration

There is no requirement for a course of study for this exam but candidates may wish to attend a revision course or undertake a self-study preparation program in advance of the examination.

<u>Note</u>:- Use and care of the sextant and the methods of calculating and correcting errors will be examined during the oral examination

Content

The examination syllabus is divided into 3 topics:

- Topic 1 Determine the compass error by celestial observation.
- Topic 2 Fix position by observation of celestial bodies.
- Topic 3 Determine latitude by celestial observation.

Aims

The aim is to ensure that candidates for Chief Mate and Master-are able to fix the ships' position and determine compass error using- celestial observations.

Level of Understanding

The level of understanding should be that considered necessary to conduct an ocean passage world wide.

Assessment

Assessment will be by a written 2 ½ hour examination of 4 questions. The pass mark

will be 65% overall but the candidate must achieve at least 65% in question 1.

Topic 1: Determining the Compass Error by Celestial Means

- a) Can determine compass error by azimuth of the sun a star or planet.
- b) Can determine compass error by amplitude of the sun.

Topic 2: Using Celestial Bodies to Fix Position

a) Can identify and select the most suitable celestial bodies for observation during the twilight period.

b) Can determine the time of sun rise, sun set and twilight.

c) Can calculate or use sight reduction tables to determine altitude and and true bearing of a celestial body.

d) Can use the nautical almanac and calculator or sight reduction tables to obtain the true bearing and intercept from a sextant altitude and chronometer time.

e) Can accurately plot position lines to obtain an observed position.

f) Can find an observed position from a transferred position line and a meridian altitude.

Topic 3: Determine Latitude by Celestial Observation.

- a) Can calculate the time of meridian altitude of the sun
- b) Can calculate the latitude by meridian altitude of the sun
- c) Can calculate the latitude by Polaris

Business and Law

June 2017

Revision No;	Changes	Author	Date
7-1	Adjust title to remove reference to 500GT	BT	9-2016
7-2	Update accident reporting and typos	BT	June 2017

Duration

The course must take place over five days or 30 hours of formal instruction. Candidates may be given course notes or a self-study preparation pack in advance.

Content

The syllabus is divided into three sections and 12 topics:

Section 1 - Legal Framework

Topic 1. Legal Framework Topic 2. Arrival and departure Topic 3. International Law

Section 2 - Safety Management

Topic 4. Safety certificate and documentationTopic 5. Prevention of marine pollutionTopic 6. Statutory safety dutiesTopic 7. Seaworthiness and safe manningTopic 8. Security

Section 3 – Contracts and Marine Insurance

Topic 9. Contracts of Salvage Topic 10. Contracts of employment Topic 11. Yacht Charter agreements Topic 12. Marine insurance

Aims

The aim of this course is to enable Masters to understand:

- Their legal obligations for the safe, secure and pollution free operation of yachts in the context of statutory obligations and civil law
- The different legal jurisdictions that apply in a vessel operating in International waters.
- Aspects of English law necessary for the correct administration of a UK-registered commercially or privately operated yacht

Level of Understanding

The level of understanding should be that considered necessary for the safe, secure and lawful operation of a commercially and privately operated yacht of up to 3000GT.

The candidate need not display an academic grasp of the legal principles involved beyond that needed for this purpose on a practical level.

Assessment

Assessment will be by a written 2.5 hour examination of five questions. The pass mark will be 60%.

SECTION 1 LEGAL FRAMEWORK

Topic 1: Legal Framework

- a) Can outline the difference between civil and criminal law and can give examples of civil wrongs and criminal offences in the context of yacht operations.
- b) Can state that certain breaches of the Merchant Shipping Act can result in substantial fines imposed by the magistrates' court.
- c) Can demonstrate an awareness of the offences that can result in significant fines on summary conviction.
- d) Can outline in general terms the concepts of:
 - i. 'negligence',
 - ii. 'duty of care',
 - iii. 'reasonable care'
 - iv. 'non delegable responsibility' and
 - v. 'vicarious liability'.
- e) Can describe the role of the MCA and the MAIB and recognise their separate functions.
- f) Can identify the importance of the following:
 - i. Merchant Shipping Acts,
 - ii. Statutory Instruments (SIs),
 - iii. Merchant Shipping Notices (MSNs),
 - Marine Guidance Notes (MGNs),
 - Marine Information Notes (MINs)
 - iv. Codes of Practice in particular, The Large Commercial Yacht Code (LY3) (or as amended)
 - v. The role of the MCA within the structure of the United Kingdom Marine Administration.
- g) Identifies the role of the Official Log Book (OLB) and is able to:
 - i. State which yachts must keep an OLB.
 - ii. State the rules governing the recording of information, including the practice of annexing documents / information.
 - iii. State with reference to yachts, when this record must start and when it must be transferred to the Registrar at Cardiff.
 - iv. State, given the considerable detail of the information to be recorded, the need to have a copy of the Official Log Book regulations for reference when making entries,
 - v. Describe the information to be recorded in the Official Log Book relevant to the operational management of a yacht and its crew
 - vi. State the nature of the entries to be made in the narrative section of the Official Log Book.

Topic 2: Arrival and departure

- a) Can identify the documentation required for arrival in port. e.g. Customs Declaration, Crew List, Clearance Documents.
- b) Can identify the circumstances giving rise to a mandatory health report and the procedure to be followed:
 - i. before arrival,
 - ii. on arrival and
 - iii. until health clearance is obtained.
- c) Can identify the role of the International Maritime Declaration of Health.

Topic 3: International Law

- a) Can define territorial waters, inland waters and high seas as defined in UNCLOS.
- b) Can describe what is meant by 'freedom of the high seas'.
- c) Can outline the rights and obligations of Flag State and Port State.
- d) Can outline the importance of the geographical position of the yacht, the nationality of the crew and of the flag of the yacht in determining criminal jurisdiction.
- e) Can outline the way international conventions can be policed, the nature of 'innocent passage' and when this may be denied.
- f) Can describe in general terms the role of Port State Control organisations.
- g) Can outline the role of the UK Register of ships in Cardiff.
- h) Can distinguish between a United Kingdom registered yacht and a British yacht.
- Can identify the relationship between the United Kingdom and the Crown Dependencies and British Overseas Territories with reference to the statutory regulation of British yachts.
- j) Can describe the contents of the MCA publication "A Master's Guide to the UK Flag – Large Yacht Edition"

SECTION 2 SAFETY MANAGEMENT

Topic 4: Safety Certificates and Documentation.

- a) Can state which vessels are required to comply with MCA 'Large Commercial Yacht Code' (as amended).
- b) Can describe the purpose of certificates listed below that may be issued for compliance with 'Large Commercial Yacht Code' (as amended) with regard to; period of validity, timing of required surveys, general subject matter of the surveys, purpose of the issuing authority 'conditions of assignment' (where applicable) and the consequences of failure to comply with the conditions of the code;
 - i. International Tonnage certificate for vessels of 24 meters or over.
 - ii. International Load Line certificate for vessels of 24 meters or over.
 - iii. Load Line Exemption certificate.
 - iv. International Safety Construction certificate for vessels of 500 GT or over.
 - v. International Safety Equipment certificate for vessels of 500 GT or over.
 - vi. International Safety Radio certificate for vessels of 300 GT or over.
 - vii. International Safety Management certificate for vessels of 500 GT or over.
 - viii. International Ship Security certificate for vessels of 500 GT or over.
 - ix. SOLAS combined safety certificate for vessels of 500 GT or over.
 - x. Certificate of Compliance for vessels of 24 metres or over.
 - xi. Safe Manning Document for vessels of 500 GT or over.
 - xii. International Oil Pollution Prevention certificate for vessels of 400 GT or over.
 - xiii. International Sewage Pollution Prevention Certificate for vessels of 400 GT or over OR more than 15 persons on board.
 - xiv.International Air Pollution Prevention Certificate for the prevention of air pollution and reduction of GHG gases (as amended).
- c) Can summarise the content of the SOLAS training manual
- d) Can summarise the content of the Load Line 'conditions of assignment'.
- e) Can define the requirement to implement a safety management system on vessels of less than 500 GT as contained in Annex 2 of the 'Large Commercial Yacht Code (as amended).

- f) Can state the difference between a 'pleasure vessel' and a vessel 'engaged in trade' as defined in the Large Yacht Code (as amended).
- g) Can state that UK registered 'private' yachts (pleasure vessels) are subject to minimum safety standards as class XII vessels.
- h) Can state that no yacht can carry more than 12 passengers and can define the word 'passenger'.

Topic 5: Prevention of Marine Pollution.

- a) Can state that the Large Yacht Code (as amended) 'Clean Seas' covers the requirements of MARPOL as applicable to Large Yachts not covered by the MARPOL regulations.
- b) Can identify the MARPOL Annexes in force and the pollutants covered by each Annex relevant to yacht operations.
- c) Can state that the provisions of the Large Yacht Code (as amended) chapters 4 to 10 meet the requirements of SOLAS for a yacht, (less than 500GT) construction.

Topic 6: Statutory Safety Duties.

- a) Can state the duty of the Master, under UNCLOS, to respond to signals of distress and the circumstances when the Master is released from his obligation to respond.
- b) Can state the Master's statutory obligations following a collision.
- c) Can state the actions to be taken with regard to statutory certificates and insurance in the event of a yacht sustaining material damage.
- d) Can define an accident as defines in annex B of MGN 458 (M+F):
 - i. a Marine Casualty,
 - ii. Very Serious Marine Casualty,
 - iii. Serious Marine Casualty
 - iv. Marine Incident
- e) Can describe the initial report following an accident and the required follow up reports

- f) Can describe the actions required after each type of incident, including declarations to other responsible authorities.
- g) can state how the MAIB can respond to such reports.
- h) Can state when the master has a duty to report dangers to navigation and can list the six categories and describe how the reports should be made.
- i) Can distinguish between compulsory and non-compulsory pilotage and the responsibilities between Master, pilot and owner.

Topic 7: Seaworthiness and Safe Manning.

- a) Can outline the Master's responsibility to ensure the seaworthiness of the vessel at the commencement of each voyage and the consequences of attempting to proceed to sea in an unsafe and unseaworthy condition.
- b) Can outline why the possession of valid statutory certificates does not prove seaworthiness.
- c) Can state the principles by which a vessel may be deemed to be safely manned in accordance with the STCW convention.
- d) Can outline the application of United Kingdom manning regulations to a yacht, and the use of the MCA Large Yacht Code (as amended) as an alternative to these regulations.
- e) Can outline how the Maritime Labour Convention 2006 (as amended) applies to yachts.
- f) Can outline how the Hours of Work legislation as described in MLC 2006 applies to yachts.

Topic 8: Security

- a) Can state the objectives of the ISPS code.
- b) Can outline the possible consequences of carrying stowaways, describe the action to be taken to prevent stowaways and action to be taken upon discovery of stowaways.
- c) Can define the three levels of security under the ISPS code.

- d) Can outline the advice given by the MCA concerning the carriage of firearms in UK registered vessels and the United Kingdom government's policy and guidance concerning the contracting of private armed guards
- e) Can define a high security risk area as an area where armed robbery or piracy are a threat.
- f) Can state the recommended precautions when approaching a high risk area.

SECTION 3 CONTRACTS AND MARINE INSURANCE

Topic 9: Contracts of Salvage

- a) Can state the definitions contained in the International Convention on Salvage (Articles 13 and 14) including SCOPIC.
- b) Can outline the practical use of Lloyds Open Form of salvage contract, and its advantages to both parties.
- c) Can outline the elements of a valid claim for salvage in Admiralty Law, in the absence of any contractual obligation to pay for the services involved.
- d) Can outline the interpretation of the expression 'a place of safety' as used in Lloyds Open Form of salvage agreement and the need, wherever possible, to agree a 'place of safety'.
- e) Can state who has the legal right to control the acceptance or rejection of assistance to yachts.
- f) Can define the legal definition of the word 'derelict'.
- g) Can outline the 'Duties of the Salvor' and the 'Duties of the Master/Owner'.
- h) Can outline the difference between contracts for assistance based on salvage principles (Lloyds open form) and other forms of salvage contract.
- i) Can outline the advantages and disadvantages to both parties in the use of each of the above forms of contract.

Topic 10: Contracts of Employment and the Merchant Navy Code of Conduct

a) Can state the circumstances in which a yacht must have an MCA approved crew agreement.

- b) Can state the circumstances in which crew member will have a contract on the basis of a Seafarers Employment Agreement (SEA) under MLC 2006.
- c) Can describe the United Kingdom regulations as they relate to the opening and closing of a crew agreement aboard yachts.
- d) Can state that crew members are entitled to a contract on the basis of an approved crew agreement or seafarers employment agreement.
- e) Can describe the standard form of approved crew agreement for yachts not governed by MLC 2006 (as amended)
- f) Can outline the relationship between an MCA approved crew agreement and any other associated contract of employment.
- g) Can outline the relationship between a Seafarer's Employment Agreement and any other associated contract of employment.
- h) Can describe the procedure for engaging a crew under the standard form of approved crew agreement.
- i) Can describe the procedure for engaging a crew under the Seafarer Employment Agreement.
- j) Can state the legal obligations of a Master for the maintenance of crew lists.
- k) Can describe the procedure for terminating a seafarers employment under the standard form of yacht crew agreement and the Seafarers Employment Agreement.
- I) Can define 'passengers', 'crew' and 'trainee' on board a yacht.
- m) Can state the statutory obligations of an employer as they relate to the maintenance and repatriation of seaman.
- n) Can describe the procedure to be followed so as to comply with United Kingdom regulations relevant to a crew member who:
 - i. dies at sea;
 - ii. is injured at sea on board a yacht or
 - iii. is incapacitated due to illness and discharged to hospital.
- o) Can outline United Kingdom employment law as it relates to yacht crew.
- p) Outline the elements of the Code of Conduct for the Merchant Navy as it relates to yachts.

- q) Outline how to apply the Code Of Conduct for the Merchant Navy,
- r) Outline the application of the Code of Conduct in relation to emergencies.
- s) Outline the meaning of fair, unfair, wrongful, and constructive dismissal,
- t) Outline the remedies for unfair dismissal,
- u) Outline the conditions for the termination of employment within the context of the crew agreement
 - i. at the request of the Master,
 - ii. request of the individual
 - iii. the direct request of the Owner.

Topic 11: Yacht Charter Agreements.

- a) Can distinguish between 'bareboat' (Demise) and 'standard' (time) yacht charter party agreements
- b) Can describe how a bareboat and time charter affect the owner and charterer in terms of their:
 - i. responsibilities;
 - ii. liabilities;
 - iii. degree of operational control.
- c) Can outline the importance of reading through all agreements prior to the charter commencing.

Topic 12: Marine Insurance.

- a) Can outline the voluntary and contractual nature of the insurance of yachts.
- b) Can distinguish between the insurance of a yacht and the insurance of other forms of Owners' liabilities.
- c) Can define the following insurance principles:
 - i. actual total loss,
 - ii. constructive total loss,
 - iii. particular average (partial loss),
 - iv. deductibles.
- d) Can state the difference between implied warranty and express warranty

- e) Can outline the following marine insurance clauses;
 - i. Navigation
 - ii. Breach of warranty
 - iii. Termination
 - iv. Perils
 - v. 3/4 collision liability
 - vi. GA and salvage
 - vii. Duty of the assured (Sue and Labour)
 - viii.Constructive total loss
 - ix. War exclusion
 - x. Tender
- f) Can outline how hull insurance policies place various restrictions on the use of a yacht, in particular the use of the yacht to save or assist in saving property.
- g) Can state that the change/loss of a Certificate of Class, change of flag or ownership or demise chartering, could all result in automatic termination of hull insurance
- h) Can outline why underwriters may prefer assistance to vessels at sea to be negotiated on the basis of Lloyds Open Form.
- i) Can describe the function of P & I Clubs.
- j) Can state the type of risks that yacht owners usually insure with P & I Clubs.
- k) Can describe the likely sequence of events after a major claim.
- Can describe what must be done immediately after an incident and subsequently, in order to act in the owner's best interests.

Stability

June 2017

Revision No;	Changes	Author	Date
7-1	Adjust title to remove reference to 500GT	BT	9-2016
7-2	Correct typos	BT	6-2017

Duration

The course must take place over five days or 30 hours of formal instruction.

Content

The course will consist of four sections and 13 topics:

Section 1: Basic Principles

Topic 1. Basic principles of hydrostatics and related terms.

Topic 2. Fineness of hull form and resistance to forward motion.

Topic 3. Statical Stability.

Topic 4. Initial stability.

Topic 5. Loading, discharging and shifting weights.

Section 2: List and Related Problems

Topic 6. List.

Topic 7. The inclining experiment.

Topic 8. The effect of slack tanks on the centre of gravity.

Section 3: Curves of Statical Stability

Topic 9. Curves of statical stability

Topic 10. Stability data supplied to yachts.

Section 4: Loll, Dry Docking and Longitudinal Stability

- Topic 11. Angle of Loll
- Topic 12. Dry-docking
- Topic 13. Longitudinal Stability

Assessment

Assessment will be by written 2.5 hour examination candidates must achieve an overall pass mark of 60%. The Exam will consist of two (2) parts. A minimum mark of 40% must be achieved in each part.

Part A will consist of 4 questions involving calculations and Explanation, Part B a question on curves of Statical stability and one question on Loll, Drydocking and longitudinal stability

Section 1 Basic Principles

Topic 1. Basic principles of hydrostatics and related terms.

- a) Can calculate the draught and freeboard for a box shaped vessel given length, breath, depth, displacement and relative density.
- b) Can calculate the displacement of a vessel given the length, breadth, draught, relative density and block coefficient.
- c) Can determine the draught from the displacement (or vice versa) using hydrostatic tables found in a vessels stability book.

Topic 2. Fineness of hull form and resistance to forward motion.

- a) Can define block coefficient.
- b) Can outline the influence block coefficient has on resistance to forward motion.
- c) Can outline how fluid flow causes resistance to forward motion with regards to skin friction, and wave making.

Topic 3. Statical Stability.

- a) Can explain the term "righting lever" and "righting moment"
- b) Can draw a transverse sketch of a vessel in stable, unstable and neutral equilibrium when heeled to a small angle, showing the positions of
 - i. centre of gravity "G",
 - ii. metacentre "M",
 - iii. point "Z",
 - iv. centre of buoyancy "B",
 - v. the buoyant force and gravity force vector.
- c) Can define, with reference to the sketch in 3b, how the forces through the centre of gravity and the centre of buoyancy react.
- d) Can describe how the vessels hull shape can affect stability.

Topic 4. Initial stability.

- a) Can define the transverse metacentre (M) and initial metacentric height (GM).
- b) Can show how KM is influenced by the beam of a vessel.
- c) Can describe the relationship between the size of a vessels GM and stiff and tender motion.
- d) Can state the dangers of a vessel being too tender or too stiff.

Topic 5. Loading, discharging and shifting weights.

- a) Can calculate the final position of KG and the GM when loading, transferring and discharging weights by taking moments about the keel using stability information data sheets.
- b) Can apply a correction for free surface in stability problems contained in 5a) above.
 - c) Can solve simple loading and discharging problems to show a vessel is in a stable condition using Simplified Stability Information making allowance for FSE.

Section 2: LIST AND RELATED PROBLEMS

Topic 6. List

- a) Can explain the effects of moving a weight off the centreline.
- b) Can draw a diagram to show that the force lines through the centre of buoyancy and centre of gravity lie in the same vertical line when at an angle of list and that the ship oscillates about this equilibrium angle.
- c) Can show that an angle of list is influenced by the size of GM.
- d) Can calculate an angle of list when a single weight is moved, loaded or discharged from the centre line.
- e) Can calculate the weight required to remove an angle of list by:
 - i. Moving a single weight already on board.
 - ii. loading a single weight.
 - iii. discharging a single weight.
- f) Can explain the effect of list, heel or rolling on the draft of a box-shaped vessel.

Topic 7. The inclining experiment

- a) Can state the reasons for conducting an inclining experiment.
- b) Can describe the procedure for conducting an inclining experiment.
- c) Can prepare a check list of precautions to be observed before and during an inclining experiment in order to ensure an accurate result.

Topic 8. The effect of slack tanks on the centre of gravity

- a) Can explain how a slack tank can cause a virtual reduction in GM.
- b) Can draw a diagram to show how this virtual reduction in GM results in a reduction of GZ.
- c) Can explain the factors affecting free surface effect with reference to FSM, RD of liquid, KG of the tank in vessel, and the effect of longitudinal subdivision.
- d) Can state that the depth of liquid in the tank doesn't influence the FSM from the tables.

- e) Can calculate the virtual GM given the solid GM and free surface correction.
- f) Can obtain the FSM from a stability data sheet and calculate the free surface correction given the relative density of the liquid and displacement of the vessel.

Section 3: Curves of Statical Stability

Topic 9. Curves of statical stability

- a) Can identify on a GZ curve of a vessel in stable equilibrium the following information:
 - i. range of positive stability,
 - ii. maximum GZ and angle at which it occurs,
 - iii. angle of vanishing stability,
 - iv. approximate angle of deck edge immersion,
 - v. dynamical stability
 - vi. approximate initial GM.
 - vii. Range of stability.
- b) Can sketch a curve for a vessel in stable equilibrium given;
 - i. initial GM,
 - ii. maximum GZ and angle at which it occurs,
 - iii. range and the angle of vanishing stability.
- c) Can distinguish between GZ curves for stiff and tender vessels.
- d) Can explain how a change in KG of the ship affects the shape and main features of the curve. (with reference to comparison between departure and arrival conditions)
- e) Can explain how a change in freeboard or beam can affect the shape and main features of the GZ curve.
- f) Can state the criteria for minimum stability identified in the current large yacht code with regards to GM, maximum GZ and angle at which it occurs.
- g) Can explain the difference between dynamic and static stability.
- h) Can state that a simplified stability curve or table of maximum KG's may be provided to show that the minimum stability criteria are met.

- i) Can explain the effect of a steady and gusting beam wind on a motor and sailing vessel and how the respective angles of heel can be assessed from the GZ curve using a constant wind-heeling lever.
- j) Can state the criteria for minimum stability identified in the current large yacht code with minimum freeboard, maximum angle of equilibrium, and minimum range of positive stability after free-flooding of any one compartment.

Topic 10. Stability data supplied to yachts.

- a) Can describe the content of the stability data booklet supplied to yachts.
- b) Can use the information given in a yacht stability booklet to determine load condition.

Section 4: Loll, Dry Docking and Longitudinal Stability

Topic 11. Angle of Loll

- a) Can explain that an initial upright vessel with a negative GM when subjected to an external force will create a capsizing moment.
- b) Can explain that provided a vessel with a small negative GM has sufficient stability it will lie in equilibrium at an angle of loll.
- c) Can explain the dangers to a vessel lying at an angle of loll in still water when it is subjected to wave action at sea or movements of a mass on board.
- d) Can explain the methods that can be used to correct an angle of loll and achieve a positive GM.
- e) Can explain how an angle of loll may be corrected or reduced on a vessel fitted with an empty tank subdivided at the centre line.
- f) Can distinguish between list and loll.

Topic 12. Dry-docking

- a) Can explain the process of slipping and lifting.
- b) Can explain the use of a docking plan.
- c) Can explain the preparation of the yacht and the dry-dock prior to drydocking.

- d) Can explain the need for an acceptable trim and adequate GM when drydocking.
- e) Can define critical period and critical moment.
- f) Can explain the meaning of P force and the effect it has on the stability of the vessel
- g) Can explain the importance of duplicating arrival tank soundings and other weight distributions when departing the dry-dock.
- h) Can explain the importance of aligning the support structure and lifting equipment with the vessel's main strength members.

Topic 13. Longitudinal Stability

- a) Can define forward perpendicular, after perpendicular, length between perpendiculars, length overall.
- b) Can define trim, change of trim, longitudinal centre of floatation, longitudinal centre of gravity, longitudinal centre of buoyancy and MCTC.
- c) Can calculate the chance of trim of a vessel when a weight already on board is shifted longitudinally when given the LCF and MCTC

Seamanship & Meteorology

June 2017

Revision No;	Changes	Author	Date
7-1	Adjust title to remove reference to 500GT	BT	9-2016
7-2	Adjust typos	BT	6-2017

Duration

This course must take place over five days or 30 hours of formal instruction.

Content

The course is divided into five Sections and 21 Topics:

Section 1: Seamanship

- Topic 1. Dangers and precautions necessary during heavy weather.
- Topic 2. Precautionary measures for maintaining buoyancy.
- Topic 3. Procedures when towing or being towed.
- Topic 4. Ship handling.
- Topic 5. Procedures for bringing a vessel to anchor.
- Topic 6. Navigational dangers.
- Topic 7. Action in emergencies.
- Topic 8. Response in emergencies.
- Topic 9. Action in the event of the loss of essential systems.

Section 2: Navigation and Passage Planning

- Topic 10. Watch keeping
- Topic 11. Navigation in Ice

Section 3: Meteorology

Topic 12. General Meteorology.

Topic 13. Tropical Revolving Storms.

Topic 14. Weather Forecasting

Section 4: SOLAS and MARPOL

Topic 15. International requirements for the safety of life at sea.

Topic 16. International requirements for the prevention of pollution at sea.

Section 5: Safety Management and The Code of Safe Working Practices for Merchant Seamen

Topic 17. Personal hygiene and safety.

Topic 18. Code of Safe Working Practices for Merchant Seamen.

Topic 29. Safety organisation and role and responsibility of the Safety Officer.

Topic 20. Reporting of unsafe practices and incidents.

Topic 21. Principles of planning work activities, setting objectives and priorities to ensure requirements are met.

Assessment

Assessment will be by written 2.5 hour examination of five questions with one question being taken from each of the above topics.

The pass mark will be 60%.

Section 1: SEAMANSHIP

Topic 1. Dangers and precautions necessary during heavy weather

- a) Can state the precautions necessary when heavy weather is forecast.
- b) Can describe the dangers of synchronous rolling.
- c) Can describe the possible dangers to the vessel and crew of heavy rolling and pitching with regard to structural damage and types of injury to personnel.
- d) Can describe the dangers of running before a following sea.
- e) Can describe the dangers of excessive speed in adverse conditions.
- f) Can state the procedure for heaving to, bow or stern to the sea.
- g) Can describe the dangers of squalls to sailing vessels.
- h) Can describe the handling characteristics of a disabled vessel in heavy weather and methods that can be used to prevent the vessel broaching to in a heavy sea.
- i) Can describe the dangers of launching and manoeuvring a rescue boat or survival craft in heavy weather.

Topic 2. Precautionary measures for maintaining buoyancy

- a) Can describe the importance of ensuring water-freeing arrangements are maintained with particular reference to deck drains and scuppers.
- b) Can describe the importance of securing anchors and chains with reference to closing the hawse and spurling pipes.
- c) Can detail the instructions to the crew for routine checks to maintain watertight integrity
- d) Can describe the possible dangers to buoyancy associated with side openings and shell doors.
- e) Can describe the practical aspect of keeping records regarding watertight integrity.

Topic 3. Procedures when towing and being towed.

- a) Can describe the selection of suitable towing points
- b) Can describe the procedure for preparing to tow or to be towed, including the selection of suitable equipment with (if applicable) reference to the Emergency Towing Procedure of the vessel.
- c) Can describe the various methods of passing and securing a tow.
- d) Can describe the methods of steering a vessel under tow and when being towed.
- e) Can describe the procedure of letting go a tow.

Topic 4. Ship handling.

- a) Can describe methods of handling a vessel in rivers, estuaries, restricted waters, and in harbours including knowledge of the following:
 - i. Turning Short round.
 - ii. The effect and movement of the pivot point.
 - iii. The effects of different propeller configurations causing 'Transverse thrust'
- b) Can describe the effects that weather, tide, head-reach, stopping distance and currents may have during ship handling.
- c) Can define the following terms used in ship handling:
 - i. Head reach.
 - ii. Advance and Transfer.
 - iii. Turning radius.
 - iv. Tactical diameter.
- d) Can describe the factors that should be taken into account when approaching a dock or berth.
- e) Can describe the effects that may be experienced when manoeuvring in shallow waters, including
 - i. reduction of under-keel clearance by squat,
 - ii. rolling and pitching.
- f) Can state the sources of manoeuvring data and state how this should be provided and displayed.

- g) Can describe the effect and dangers of interaction between passing vessels.
- h) Can describe the design and limitations of different manoeuvring and propulsion systems.
- i) Can state the precautions necessary when embarking, navigating and disembarking a pilot.
- j) Can outline the requirements when navigating with a pilot on board.

Topic 5. Procedures for bringing a vessel to anchor.

- a) Can describe the factors in selecting an anchorage, with regard to weather and the type of the holding ground.
- b) Can describe the methods of anchoring using one or two anchors.
- c) Can describe the operation of a running moor, standing moor and Mediterranean moor.
- d) Can describe the procedure for clearing a fouled anchor.
- e) Can describe the requirement for an anchor watch.
- f) Can describe actions when dragging anchor.
- g) Can describe the precautions when anchoring in heavy weather.
- h) Can describe the precautions required when anchoring in deep water.

Topic 6. Navigational dangers.

a) Can describe the possible navigational dangers likely to be encountered in coastal and shallow waters.

Topic 7. Actions in Emergency situations.

- a) Can describe action to assist a ship or aircraft in distress, including sources of information.
- b) Can describe actions to be taken if grounding is imminent, and after grounding.
- c) Can describe re-floating a grounded vessel with and without assistance.
- d) Can outline the procedure for beaching a vessel.
- e) Can outline the action to be taken after a collision.
- f) Can describe measures to preserve stability and trim in event of damage.
- g) Can describe man-over-board manoeuvres.

h) Can state the necessity to keep records and make reports to meet statutory and organisational requirements.

Topic 8. Response in emergency.

- a) Can create and manage strategic procedures in event of an emergency.
- b) Can identify the allocation of resources, and emergency duties to teams and individuals.
- c) Can outline the practical use of contingency plans.
- d) Can describe the organisation and benefits of drills, musters and other emergency training.
- e) Can outline crowd control management and the handling of passengers and personnel.
- f) Can outline the actions necessary when preparing for, and abandoning, ship.
- g) Can describe the risk of abandoning the vessel.

Topic 9. Action required in the event of loss of essential systems

- a) Can state the actions to be taken in the event of loss of steering.
- b) Can describe the operation of emergency steering systems.
- c) Can ouline the options available for steering following the loss of directional stability.
- d) Can describe the actions to be taken in a drifting vessel.

Section 2: NAVIGATION AND PASSAGE PLANNING

Topic 10. Watchkeeping

- a) Can detail the procedures for the keeping of a safe navigational watch.
- b) Can describe the procedures for establishing a navigational policy, including watch-keeping arrangements and hours of work.
- c) Can state the importance of procedures and principles when handing over, relieving and maintaining a watch.
- d) Can detail the officer of the watch's role and responsibilities with particular reference to maintaining a lookout, monitoring traffic, the vessel and environment.

- e) Can describe the responsibilities and duties of lookouts.
- f) Can state the precautions necessary when changing over from hand to automatic steering and vice-versa.
- g) Can outline the possible dangers in the use of VHF in collision avoidance.
- h) Can state the importance of correct logbook entries and other record maintenance activities.
- i) Can describe the necessity for clear and concise bridge communication between members of the bridge team during the monitoring of the passage.
- j) Can describe the importance and significance of Master's standing orders and night orders.

Topic 11. Navigation in Ice

- a) Can describe the dangers of navigation in or near ice.
- b) Can outline the formation of ice accretion on vessels and the associated dangers.
- c) Can describe the preparations that should be made prior to entering areas prone to icing as specified in Chapter 7.39 on NP100.
- d) Can list the different types of ice and the hazards they may present.

Section 3: METEOROLOGY

Topic 12. General Meteorology

- a) Can describe the terms:
 - i) lapse rates and
 - ii) atmospheric stability.
- b) Can outline the process of cloud formation.
- c) Can list the main types of cloud.
- d) Can describe local and regional effects of heating and cooling
- e) Can describe the causes and the weather experienced during the North East and South West monsoon of the Indian Ocean.
- f) Can describe the formation of permanent and semi-permanent high and low pressure areas.
- g) Can state the relationship between pressure distribution and wind.

- h) Can show a basic understanding of air masses and their properties.
- i) Can describe the weather associated with rising and falling pressure.
- j) Can define the terms pressure tendency and pressure gradient.

Topic 13. Tropical Revolving Storms

- a) Can state the principle areas and times of year when tropical storms can be expected (as defined in NP100).
- b) Can describe why tropical storms form in low latitudes.
- c) Can state the likely signs of an approaching tropical storm.
- d) Can describe the formation of tropical storms.
- e) Can draw a diagram of a North or South hemisphere tropical storm showing the wind direction and the dangerous and navigable sectors. (as shown in NP100)
- f) Can describe, using diagrams, the probable paths of a tropical storm in the southern and northern hemisphere and the strategies for the avoidance of these storms as contained in the Mariners Handbook (NP100)

Topic 14. Weather Forecasting

- a) Can interpret marine weather forecasts.
- b) Can define the types of weather messages including surface analysis and forecast charts and common weather chart symbols.
- c) Can state the organisations providing meteorological information to shipping.
- d) Can define the reliability of weather forecasts with respect to interval and forecast duration.
- e) Can describe the use of weather messages to deduce the probable weather and changes in the weather.

Section 4: SOLAS and MARPOL

Topic 15. International requirements for safety of life at sea.

- a) Can state the lifesaving appliances required on a large yacht by LY3 (as amended) and SOLAS.
- b) Can state the fire fighting equipment required on a large yacht by LY3 (as amended) and SOLAS.

Topic 16. International requirements for the prevention of pollution at sea MARPOL.

- a) Can describe the content of the SOPEP manual,
 - i. the action to be taken in the event of an accidental oil spillage,
 - ii. the oil anti-pollution procedures,
 - iii. the associated equipment to be carried onboard.
- b) Can state which yachts must maintain an Oil Record Book in an approved form
- c) Can list the contents of the ORB.
- d) Can state the circumstances in which discharges of oily substances (MARPOL Annex 1) may be permitted.
- e) Can outline the practical prevention of oil spills with particular reference to bunkering operations.
- f) Can outline the precautions required by MARPOL Annex IV necessary to protect the marine environment with regard to sewage.
- g) Can outline the garbage management plan as contained in MARPOL Annex V, including
 - i. the requirement for record keeping,
 - ii. the limitations associated with at sea garbage disposal areas,
 - iii. the problems associated with garbage segregation, onboard storage and landing garbage in port.
- h) Can state which yachts must maintain a Garbage Record Book, have a Garbage Management Plan and display a Garbage Placard.
- i) Can state the precautions required by (MARPOL Annex VI) necessary to protect the marine environment with regard to air pollution and the reduction of GHG emissions.

Section 5: SAFETY MANAGEMENT AND THE CODE OF SAFEWORKING PRACTICES FOR MERCHANT SEAFARERS

Topic 17. Personal hygiene and safety

- a) Can outline the importance of complying with the health and hygiene requirements.
- b) Can state the importance of personal care in hot climates.
- c) Can outline the importance of regular inspections of accommodation.

Topic 18. Code of Safe Working Practices for Merchant Seafarers.

- a) Can outline the content of the Code of Safe Working Practices for Merchant Seafarers (2015) and describe its use in the management of safety on board a yacht.
- b) Can state the regulatory status of the Code of Safe Working Practices for Merchant Seafarers.
- c) Can state the importance of personal responsibility for ensuring safe working practices, safe work area and following safety procedures.
- d) Can outline the principles of risk assessment and describe the permit to work system.
- e) Can describe and list the precautions necessary and the dangers involved in the following;
 - i. enclosed space entry,
 - ii. working over the side,
 - iii. working at height,
 - iv. launching and recovering tenders (including making way),
 - v. using chemicals,
 - vi. using power tools,
 - vii. mooring,
- f) Can outline the requirements of the COSHH regulations as a source of information available for chemicals that are potentially hazardous when used or carried on board.
- g) Can describe the importance of pre task safety briefings (tool box talks).
- h) Can describe the importance of fire prevention on board and fire fighting emergency training exercises.

Topic 19. Safety organisation and role and responsibility of the Safety Officer.

- a) Can state the role of master, safety officer and safety representative.
- b) Can describe the role of the safety committee.
- c) Can summarise the duties of employer with regard to safety officers, safety representatives and safety committees.
- d) Can outline the importance of the ISM Code.
- e) Can define the objectives of a Safety Management System under the ISM code.
- f) Can describe the requirement for and importance of safety meetings.
- g) Can describe the practical aspects of safety inspections.
- h) Can define the importance of keeping records.
- i) Can state the duties and powers of the Safety Officer.

Topic 20. Reporting of unsafe practices and incidents.

- a) Can outline the importance of reporting 'near miss' incidents.
- b) Can describe the process of accident investigation.
- c) Can describe the action required on encountering an unsafe operation.
- d) Can explain the importance of rectifying and eliminating unsafe conditions and potential hazards.

Topic 21. Principles of planning work activities, setting objectives and priorities to ensure requirements are met.

- a) Can state the importance of onboard working relationships.
- b) Can describe the importance of crew resource management.
- c) Can outline the strategies for encouraging effective working relationships