REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
MARITIME INDUSTRY AUTHORITY

MARINA Circular No. 2014 - 01

ANNEX I

NEW MANAGEMENT LEVEL COURSE FOR MARINE DECK OFFICERS

(Masters and Chief Mates)

In Accordance with
2010 Manila Amendments to the
1978 STCW Convention

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FOREWORD

This New Management Level Course for Marine Deck Officers was developed to comply with the requirements under Regulation II/2 of the 2010 Manila Amendments to the 1978 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention).

The curriculum was designed based on the minimum standards of competence provided in Table A-II/2 under the said regulation and guided by the revised IMO Model Course 7.01 (Masters and Chief Mates), which was validated during the 44th session of the IMO's Sub-Committee on Standards of Training and Watchkeeping (STW 44) held from 29 April to 3 May 2013. Likewise, the newly revised approved education and training for Officers In Charge of a Navigational Watch on seagoing ships of 500 gross tonnage or more, otherwise known as the Bachelor of Science in Marine Transportation (BSMT) program, which was approved and issued under the oversight and supervision of the STCW Administration through CHED Memorandum Order (CMO) No. 31, series of 2013, has been accorded due consideration since the said program now covers specific topics in the management level course for marine deck officers.

In order to avoid duplication or repetition of subjects/topics and also to ensure congruence between the BSMT and this Management Level Course, a course mapping was made to identify which management level subjects or topics were already covered in the aforesaid program. The management level topics that were already covered in the BSMT are no longer repeated in this New Management Level Course for Marine Deck Officers.

Guided by the topics or subjects and the corresponding time allocation in the above-mentioned revised IMO Model Course 7.01, the curriculum for the New Management Level Course for Marine Deck Officers was formulated in accordance with the 2010 Manila Amendments to the 1978 STCW Convention.

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FUNCTION 1

NAVIGATION AT THE MANAGEMENT LEVEL

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FUNCTION 1

PART A
COURSE FRAMEWORK

SCOPE
This Function covers the mandatory requirements for knowledge, understanding and proficiencies for *"Navigation at the Management Level"* as provided for under the 2010 STCW Manila Amendments, Regulation II/2 in relation to Section A-II/2, Table A-II/2 thereof. The topics were carefully selected following a course mapping based on the revised IMO Model Course 7.01 and the revised BSMT program under CMO No. 31, series of 2013, which now covers specific management level topics under this function.
LEARNING OBJECTIVES
Upon succesful completion of the training under this Function, trainees shall be expected to have gained the minimum knowledge, understanding and proficiencies needed to carry out and undertake at the management level the tasks, duties and responsibilities for the safe navigation of a ship of 3,000 gross tonnage or more.
ENTRY STANDARDS
Entrants to this course must be Marine Deck Officers who are holders of Certificate of Competency (COC) under Regulation II/1 of the STCW '78 Convention, as amended and have not less than one (1) year of seagoing service as officer in charge of a navigational watch on ships of 500 gross tonnage or more.
COURSE INTAKE LIMITATION
▪ Trainees shall not exceed 24 students per class. ▪ Practical training using a full mission bridge simulator shall follow a man-machine ratio of 4:1 and 2:1 for ECDIS.
STAFF REQUIREMENTS
Every METI offering this Management Level Course shall have a Training Supervisor, a minimum of two (2) instructors and an assessor for the course; subject the approval by the Administration in accordance with MARINA Circular (MC) No. 2013-03, as amended by MC 2013-12, series of 2013. The qualification requirements shall be as follows:

STAFF REQUIREMENTS *(Continued…)*

Training Supervisor

- Holder of at least a Bachelor of Science Degree;
- Have not less than one (1) year experience in maritime education and training;
- Have an understanding of the training course and the specific objectives of the training being conducted under his supervision; and
- Holder of a Certificate of Completion of Instructor's Training Course (IMO Model Course 6.09) or 18 earned units in teacher education covering teaching methodologies, test and measurement.

Instructors

- Management Level Deck Officer with not less than one (1) year of seagoing service in that capacity on board seagoing ship of 3,000 GT or more;
- Holder of a Certificate of Completion of Instructor's Training Course (IMO Model Course 6.09) or 18 earned units in teacher education covering teaching methodologies, test and measurement;
- Holder of a Certificate of Completion of the Management Level Course for Marine Deck Officers;
- Holder of a COC as Management Level Marine Deck Officer;
- Holder of a valid Professional Regulation Commission (PRC) License as Management Level Marine Deck Officer;
- If conducting training using simulator:
  - Must be holder of a Certificate of Completion of the "Train the Simulator Trainer and Assessor" (IMO Model Course 6.10), or approved Training Course for Simulator Instructors and Assessors; and
  - Have gained practical operational experience on the particular type of simulator being used.

STAFF REQUIREMENTS *(Continued…)*

Assessors

- Management Level Deck Officer with not less than one (1) year seagoing service in that capacity on board seagoing ship of 3000 GT or more;
- Holder of a Certificate of Completion of the Management Level Course for Marine Deck Officers;
- Holder of a valid PRC License as Management Level Marine Deck Officer;
- Holder of a Certificate of Completion of the Training Course in Assessment, Examination and Certification of Seafarers (IMO Model Course 3.12);
- Have gained practical assessment experience as understudy for not less than three (3) times;
- If conducting assessment involving the use of simulators:
  - Must be holder of a Certificate of Completion of the Train the Simulator Trainer and Assessor (IMO Model Course 6.10), or approved Training Course for Simulator Instructors and Assessors; and
  - Have gained practical assessment experience on the particular type of simulator being used under the supervision and to the satisfaction of an experienced Assessor for not less than three (3) times.

Resource Person

The METI may be allowed to engage the services of other persons with established expertise on particular topics, provided that the Administration shall be duly informed at least five (5) working days prior to engagement.

NOTE TO METIs:

The foregoing are the qualification standards that must be met by the Instructors, Assessors and Supervisor. In addition, METIs shall exercise utmost diligence and responsibility in the selection of such Staff and ensure that they are appropriately qualified to carry out effective teaching, assessment and supervision of the course, respectively.

TRAINING FACILITIES
▪ For the theoretical part, a classroom with multi-media over-head projector, with a computer set, and a white board with eraser will be utilized, among others. This does not however preclude METIs from utilizing additional teaching aids to facilitate learning.
TRAINING EQUIPMENT
A Full Mission Bridge Simulator certified as Class "A" or similar category showing reference to STCW Table A-II/2, by an internationally recognized Classification Society, capable of simulating a total shipboard bridge operation and can perform advanced maneuvering in restricted waterways including own ship capabilities for ships inter-action, bank suction and bank cushion, with briefing and debriefing rooms among others. ECDIS Training equipment prescribed by the Administration shall also be provided for this course.
EXEMPTION
Trainees who have already completed training on the *"Operational Use of Electronic Chart, Display and Information System [ECDIS]"* (IMO Model Course 1.27) can be exempted from the training requirements under Module 5 of this Function but shall still be subjected to assessment covering the said Module.
CERTIFICATE OF COURSE COMPLETION
Trainees who succesfully completed this Function and passed the assessment thereof, shall be issued a Certificate of Completion. The format of such certificate shall be in accordance with the format prescribed by the Administration.
SUGGESTED TEXT BOOKS AND REFERENCES
For the textbooks and reference materials, METIs should refer to the list of Teaching Aids, Videos, References, Textbooks and Bibliographies indicated in the revised IMO Model Course 7.01 validated during the 44th Session of the IMO's Sub-Committee on STW. This does not however preclude METIs from utilizing other relevant and more updated books and references that may be available or prescribed by the Administration. METIs shall also exercise prudence and utmost responsibility in selecting the textbooks and references for this Function to ensure that only relevant and up-to-date ones shall be utilized.

FUNCTION 1

PART B
COURSE OUTLINE

MAIN TOPICS	**NO. OF HOURS**
Competence	
F1 - Module 1: Plan a Voyage and Conduct Navigation	
1. Routeing in accordance with the general provisions on ship's routeing	12
2. Reporting in accordance with the general principles for ship reporting systems and with VTS procedures	1
F1 - Module 2: Coordinate Search and Rescue Operations	
1. The procedures contained in the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) *Respond to a distress message* *Coordinate search and rescue operation* *Execute a search and rescue operation*	6
F1 - Module 3: Establish watchkeeping arrangements and procedures	
1. The International Regulations for Preventing Collisions at Sea, 1972, as amended	30
2. Principles to be observed in keeping a navigational watch	12
3. Bridge wathckeeping equipment and systems	6
F1 - Module 4: Maintain safe navigation through the use of information from navigation equipment and systems to assist command decision-making	40
1. System errors and operational aspects of modern navigation systems including Radar and ARPA	
2. Blind pilotage planning	
3. Evaluation of navigational information to aid in command decisions for avoiding collision and the safe navigation of the ship	
4. Interrelationship and optimum use of all navigational data	

MAIN TOPIC	**NO. OF HOURS**
Competence	
F1 - Module 5: Maintain the safety of navigation through the use of ECDIS and associated navigation systems to assist command decision-making	
1. Command decision-making using the information provided by ECDIS and associated navigation systems, including: *Management of operational procedures, system files & data* *Use ECDIS playback functionality for passage review, route planning and review of system functions*	40
F1 - Module 6: Respond to Navigational Emergency	
1. Precautions when beaching a ship	2
2. Actions to be taken if grounding is imminent and after grounding	2
3. Re-floating a grounded ship with or without assistance	1
4. Actions to be taken if collision is imminent, after collision or impairment of the watertight integrity of the hull by any cause	2
5. Assessment of damage control	1
6. Emergency steering	1
7. Emergency towing arrangements and towing procedures	2
Competence	
F1 - Module 7: Maneuver and handle the ship in all conditions	
1. Approaching pilot stations and embarking or disembarking pilots, with due regard to weather, tide, head reach and stopping distances	4
2. Handling ship in rivers, estuaries and restricted water having regard to the effects of current, wind and restricted water on helm response	10
3. Application of constant rate of turn techniques	3
4. Maneuvering in shallow water including the reduction in under-keel clearance caused by squat, rolling and pitching	2
5. Interaction between passing ships and between own ship and nearby banks (canal effect)	2
6. Berthing and un-berthing under various conditions of wind, tide and current with and without tugs	20

MAIN TOPIC	**NO. OF HOURS**
Competence	
F1 - Module 7: (Continued…)	
7. Ship and tug interaction	3
8. Use of propulsion and maneuvering systems including different types of rudder	4
9. Choice of anchorage; anchoring with one or two anchors in limited anchorages and factors involved in determining the length of anchor cable to be used	6
10. Procedures for anchoring in deep water and in shallow water	1
11. Dragging anchor; clearing fouled anchors	1
12. Dry-docking	4
13. Management and handling ships in heavy weather, including assisting a ship or aircraft in distress; towing operations; means of keeping an unmanageable ship out of trough of the sea; lessening drift and use of oil	6
14. Precautions in maneuvering to launch rescue boats or survival craft in bad weather	2
15. Methods of taking on board survivors from rescue boats and survival craft	1
16. Ability to determine the maneuvering and propulsion characteristics of common types of ships, with special reference to stopping distances and turning circles at various draughts and speeds	3
17. Importance of navigating at reduced speed to avoid damage caused due to own ship‘s bow and stern waves	1
18. Practical measures to be taken when navigating in or near ice or in conditions of ice accumulation on board	4
19. Use of, and maneuvering in and near, traffic separation schemes and in vessel traffic service (VTS) areas	4
TOTAL FOR FUNCTION 1:	**239**

Geneal Rule on Time Allocation:

METIs must note that the number of hours allocated for the topics in this Function are the minimum and can be increased as may be necessary to cover new requirements, laws, rules and regulations, new developments, trends and practices in the maritime industry.

FUNCTION 1

PART C
COURSE SYLLABUS

F1 - Module 1

Competence: ***Plan a voyage and conduct navigation***

1. Routeing in accordance with the general provisions on ship's routeing

1.1 Routeing

1.1.1 Selects ocean and coastal routes that appropriately consider:

- Mandatory or recommended requirements including the IMO Routeing Guide
- Distance
- Average passage speed and fuel consumption
- Availability of position monitoring
- safety of life, property and the environment

1.1.2 Selects appropriate routes using:

- weather routeing information received from shore based providers
- weather routeing techniques using synoptic and prognosis information observed and received from ashore

2. Reporting in accordance with the general principles for ship reporting systems and with VTS procedures

2.1 Ship reporting system

2.1.1 explains the general principles for various ship reporting systems

2.1.2 explains the general principles for reporting as per VTS procedures

2.1.3 determines the reporting requirements for particular reporting and VTS systems

2.1.4 explains the use of AIS within reporting systems

2.1.5 makes reports in accordance with published procedures and criteria

F1 - Module 2

Competence: *Coordinate Search and Rescue Operations*

1. **The procedures contained in the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual**

1.1 Respond to a distress message

1.2 Coordinate search and rescue operation

1.3 Execute a search and rescue operation

Note: Refer to IMO Model Courses No. 1.08 (Radar, ARPA, Bridge Teamwork and Search and Rescue) on the management level perspective for more details of this module.

F1 - Module 3

Competence: *Establish watchkeeping arrangements and procedures*

1. **The International Regulations for Preventing Collisions at Sea**

1.1. International Regulations for Preventing Collisions at Sea , 1972, as amended

1.1.1. demonstrates a thorough knowledge of the content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, as amended
1.1.2. describes the lights, shapes and sound signals that should be shown or made by own ship in any situation
1.1.3. demonstrates the ability to determine risk of collision and to take appropriate action when encountering all types of vessel when in sight of one another by day or night.
1.1.4. demonstrates the ability to determine the risk of collision and the proper action to take to avoid collision in restricted visibility
1.1.5. determines a safe speed for any situation
1.1.6. demonstrates the ability to take appropriate actions when manoeuvring in narrow channels and traffic separation schemes including encounters with other vessels
1.1.7. demonstrates the ability to maintain situational awareness, determine risk of collision and to take appropriate action in situations of high traffic density both when vessels are in sight and when in restricted visibility
1.1.8. demonstrates the ability to take appropriate action when another vessel is believed not to be taking the action required under the Regulations or where a collision cannot be avoided by the action of this vessel alone

2. Principles to be observed in keeping a navigational watch

2.1. Thorough knowledge of the content, application and intent of the principles to be observed in keeping a navigational watch

2.1.1. determines appropriate watch keeping arrangements that are adequate for maintaining safe watchkeeping taking into account the prevailing circumstances and conditions

2.1.2. determines the appropriate composition of the watch for differing situations

2.1.3. determines and posts watch schedules that ensure that rest periods are observed and that watchkeepers are fit for duty for operational conditions

2.1.4. ensures that the responsibilities and expected actions of the Master when in charge of the navigational watch and the officer of the watch at other times are consistent with the Principles outlined in the STCW Code and that these are clearly understood by these officers, including:

- calling the Master
- expectation of action until the Master formally takes control of the watch
- physical presence on the bridge
- maintaining an effective lookout
- not undertaking any duties that interfere with watchkeeping
- determining if there is risk of collision and the correct application of Colreg
- monitoring and adjusting the vessel position in a accordance with the voyage plan
- knowing the handling characteristics of their ship, including its stopping distances
- using the helm, engines and sound signaling apparatus
- familiarization and operational use of all bridge equipment, charts, and publications
- the checks and tests
- the actions expected when encountering restricted visibility or distress situations
- actions when pilots are embarked
- actions when there is any doubt

2.1.5. Prepares standing orders for watchkeeping at anchor or underway

2.1.6. ensures that an appropriate lookout is maintained at all times

2.1.7. states that watch schedules must be posted and accessible

2.1.8. states the contents of the STCW CODE section A-VIII/2, Part 4-1 – Principles to be observed in keeping a navigational watch

2.1.9. states that watch duties should be so arranged to comply with rest periods prescribed in the STCW CODE CHAPTER VIII Standards regarding watchkeeping Section A-VIII/1 Fitness for duty

2.1.10. states that the officer in charge of the navigational watch is the master‘s representative and is primarily responsible at all times for the safe navigation of the ship and for complying with the International Regulations for Preventing Collisions at Sea, 1972, as amended

2.1.11. states that officers in charge of the navigational watch under the master‘s general direction are responsible for navigating the ship safely during their periods of duty, when they should be physically present on the navigating bridge or in a directly associated location such as the chartroom or bridge control room at all times

2.1.12. states that the master, chief engineer officer and officer in charge of watch duties should maintain a proper watch, making the most effective use of the resources available, such as information, installations/equipment and other personnel

2.1.13. states that the lookout must be able to give full attention to the keeping of a proper lookout and that no other duties should be undertaken or assigned which could interfere with that task

2.1.14. states that the duties of the lookout and helmsperson are separate and that the helmsperson should not be considered to be the lookout while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper lookout

2.1.15. lists all factors to be considered to decide if the officer in charge of the navigational watch can be the sole lookout in daylight

2.1.16. lists all relevant factors to be taken into account by the Master in determining that the composition of the navigational watch is adequate to ensure that a proper lookout can continuously be maintained, including those described in the STCW Code

2.1.17. outlines all factors to be taken into account when deciding the composition of the watch on the bridge, which may include appropriately qualified ratings

2.1.18. states that the officer in charge of the navigational watch should:

- keep the watch on the bridge;

- in no circumstances leave the bridge until properly relieved; and
- continue to be responsible for the safe navigation of the ship, despite the presence of the master on the bridge, until informed specifically that the master has assumed that responsibility and this is mutually understood

2.1.19. states that the officer in charge of the navigational watch should not be assigned or undertake any duties which will interfere with the safe navigation of the ship

2.1.20. states that in cases of need, the officer in charge of the navigational watch should not hesitate to use the helm, engines and sound signaling apparatus. However, timely notice of intended variations of engine speed should be given where possible or effective use should be made of UMS engine controls provided on the bridge in accordance with the applicable procedures

2.1.21. states that the officers of the navigational watch should know the handling characteristics of their ship, including its stopping distances, and should appreciate that other ships may have different handling characteristics

2.1.22. states that the officer in charge of the navigational watch should make sure that a proper lookout is maintained at all times

2.1.23. states that in a ship with a separate chartroom, the officer in charge of the navigational watch may visit the chartroom, when essential, for a short period for the necessary performance of navigational duties, but should first ensure that it is safe to do so and that proper lookout is maintained

2.1.24. lists all the checks that should be carried out during the navigational watch by the officer in charge of the navigational watch

2.1.25. states that the officers of the navigational watch should be thoroughly familiar with the use of all electronic navigational aids carried, including their capabilities and limitations, and should use each of these aids when appropriate and should bear in mind that the echo sounder is a valuable navigational aid

2.1.26. states that whenever restricted visibility is encountered or expected, the officer in charge of the navigational watch should use the radar, and at all times in congested waters, having due regard to its limitations

2.1.27. lists all the circumstances when the officer in charge of the navigational watch should notify the master immediately, which are:

- if restricted visibility is encountered or expected;
- if the traffic conditions or the movements of other ships are causing concern;
- if difficulty is experienced in maintaining course;
- on failure to sight land, or a navigation mark or to obtain soundings by the expected time;
- if, unexpectedly, land or a navigation mark is sighted or a change in soundings occurs;
- on breakdown of the engines, propulsion machinery remote control, steering gear or any essential navigational equipment, alarm or indicator;
- if the radio equipment malfunctions;
- in heavy weather, if in any doubt about the possibility of weather damage;
- if the ship meets any hazard to navigation, such as ice or a derelict; and
- in any other emergency or if in any doubt;

2.1.28. states that the officer in charge of the navigational watch, should not hesitate to take immediate action for the safety of the ship, where circumstances so require, despite notifying the master immediately in the circumstances considered important for his presence on the bridge

2.1.29. states that the officer in charge of the navigational watch should give watch keeping personnel all appropriate instructions and information which will ensure the keeping of a safe watch, including a proper lookout

2.1.30. states that in clear weather the officer in charge of the navigational watch should take frequent and accurate compass bearings of approaching ships as a means of early detection of risk of collision and should bear in mind that such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large ship or a tow or when approaching a ship at close range

2.1.31. states that the officer in charge of the navigational watch should also take early and positive action in compliance with the applicable International Regulations for Preventing Collisions at Sea, 1972, as amended and subsequently check that such action is having the desired effect

2.1.32. states that when restricted visibility is encountered or expected, the first responsibility of the officer in charge of the navigational watch is to comply with the relevant rules of the International Regulations for Preventing Collisions at Sea, 1972, as amended with particular regard to the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate maneuver

2.1.33. states that in addition to the above, the officer in charge of the navigational watch shall:

- inform the master;
- post a proper lookout;
- exhibit navigation lights; and
- operate and use the radar

2.1.34. states that when arranging lookout duty, in hours of darkness, the master and the officer in charge of the navigational watch, should have due regard to the bridge equipment and navigational aids available for use, their limitations, procedures and safeguards implemented

2.1.35. states that in Coastal and congested waters the largest scale chart on board, suitable for the area and corrected with the latest available information, should be used

2.1.36. states that fixes in Coastal and congested waters should be taken at frequent intervals, and should be carried out by more than one method whenever circumstances allow

2.1.37. states that when using ECDIS, in coastal and congested waters, appropriate scale of electronic navigational charts should be used and the ship‘s position should be checked by an independent means of position fixing at appropriate intervals

2.1.38. states that in coastal and congested waters the officer in charge of the navigational watch should positively identify all relevant navigation marks

2.1.39. states that when navigating with pilot on board, despite the duties and obligations of pilots, their presence on board does not relieve the master or the officer in charge of the navigational watch from their duties and obligations for the safety of the ship

2.1.40. states that when navigating with pilot on board, the master and the pilot should exchange information regarding navigation procedures, local conditions and the ship‘s characteristics

2.1.41. states that when navigating with pilot on board, the master and/or the officer in charge of the navigational watch should co-operate closely with the pilot and maintain an accurate check on the ship‘s position and movement

2.1.42. states that when navigating with pilot on board, if in any doubt as to the pilot‘s actions or intentions, the officer in charge of the navigational watch should seek clarification from the pilot and, if doubt still exists, should notify the master immediately and take whatever action is necessary before the master arrives.

3. Knowledge of voyage data recorders (VDR) and bridge navigational watchkeeping alarm systems (BNWAS)

3.1. Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR)

3.1.1. explains that Voyage data recorder (VDR)and Simplified Voyage Data Recorder (S-VDR) means a complete system, including any items required to interface with the sources of input data, for processing and encoding the data, the final recording medium in its capsule, the power supply and dedicated reserve power source

3.1.2. explains that the purpose of a voyage data recorder (VDR) and Simplified Voyage Data Recorder (S-VDR) is to maintain a store, in a secure and retrievable form, of information concerning the position, movement, physical status, command and control of a vessel over the period leading up to and following an incident having an impact thereon

3.1.3. explains that the Information contained in a VDR and S-VDR is made available to both the Administration and the ship owner and this information is for use during any subsequent investigation to identify the cause(s) of the incident

3.1.4. describe the operation of a VDR and S-VDR, that is it:

- continuously maintains sequential records of preselected data items relating to the status and output of the ship's equipment, and command and control of the ship;
- permits subsequent analysis of factors surrounding an incident, the method of recording ensures that the various data items are co-related in date and time during playback on suitable equipment. The final recording medium is installed in a protective capsule and in case of S-VDR of either a fixed or float-free type that meets all of the following requirements:
  - is capable of being accessed following an incident but secure against tampering;
  - for VDR - it maximizes the probability of survival and recovery of the final recorded data after any incident;
  - for S-VDR –it maintains the recorded data for a period of at least 2 years following termination of recording;
  - is of a highly visible colour and marked with retro-reflective materials; and
  - is fitted with an appropriate device to aid location

3.1.5. explains the requirements set out in MSC resolution A.861(20) on the fixed type protective capsule for S-VDR

3.1.6. explains that the equipment is so designed that, as far as is practical, it is not possible to tamper with the selection of data being input to the equipment, the data itself nor that which has already been recorded, and any attempt to interfere with the integrity of the data or the recording is recorded

3.1.7. explains that the recording method is such that each item of the recorded data is checked for integrity and an alarm is given if a non-correctable error is detected

3.1.8. describes the continuity of operation of VDR and S-VDR

3.1.9. list and state the data items recorded in the VDR and S-VDR, which are:

- date and time
- ship‘s position
- ship‘s speed
- bridge audio
- communications audio
- radar data, post-display selection (or, for S-VDR only, AIS data if radar data is not available)

in addition to the above data sets, a VDR should also record:

- depth under the keel
- status of all mandatory bridge alarms
- rudder order and rudder position
- engine orders and engine response (rev/min or pitch), including any transverse - thrusters
- status of hull openings
- status of watertight doors and fire doors
- wind speed and direction

3.1.10. explains the Data output interface of VDR and S-VDR, that they provide an interface for downloading the stored data and playbacks the information to an external computer. This interface is compatible with an internationally recognized format, such as Ethernet, USB, FireWire, or equivalent

3.1.11. describes the software for data downloading and playback

3.1.12. states that the ship owner, in all circumstances and at all times, owns the VDR and its information

3.1.13. explains that in the event of an accident the owner of the ship makes all decoding instructions available as necessary to recover the recorded information and maintains the same

3.1.14. explains the recovery and relevant information of VDR and S-VDR

3.1.15. explains the custody, read-out and access to the VDR and S-VDR information

3.1.16. describes the limitations of the receivers

3.2. Bridge Navigational Watch Alarm System (BNWAS)

3.2.1. explains that the carriage requirement of Bridge Navigational Watch Alarm Systems (BNWAS), is set out by SOLAS chapter V/19 and the requirements will be mandatory for new ships and phased-in for existing ships

3.2.2. states when BNWAS must be fitted to existing ships

3.2.3. explains that the purpose of BNWAS is to monitor bridge activity and detect operator disability, which could lead to marine accidents

3.2.4. explains that this purpose is achieved by a series of indications and alarms to alert first the OOW and, if he/she is not responding, then to alert the Master or another qualified OOW

3.2.5. explains that the system monitors the awareness of the officer-on-watch (OOW) and automatically alerts the Master or other qualified OOW if for any reason the OOW becomes incapable of performing watch duties

3.2.6. explain that additionally, the BNWAS may provide the OOW with a means of calling for immediate assistance if required

3.2.7. explain that the BNWAS should be operational whenever the ship‘s heading or track control system is engaged, unless inhibited by the Master

3.2.8. explains that the system has the following operational modes: Automatic, Manual On and Manual Off

3.2.9. list and explain the operational sequence of indications and alarms:

- once operational, the alarm system remains dormant for a period of between 3 and 12 min (Td- selected dormant period)
- at the end of this dormant period, the alarm system initiates a visual indication on the bridge
- if not reset, the BNWAS additionally sounds a first stage audible alarm on the bridge 15sec after the visual indication is initiated
- if not reset, the BNWAS additionally sounds a second stage remote audible alarm in the back-up officer‘s and /or Master‘s location 15sec after the first stage audible alarm is initiated

- if not reset, the BNWAS additionally sounds a third stage remote alarm at locations of further crew members capable of taking corrective actions 90 seconds after the second stage remote audible alarm is initiated
- in vessels other than passenger vessels, the second or third stage remote audible alarms may sound in all the above locations at the same time. If the second stage audible alarm is sounded in this way, the third stage alarm may be omitted

3.2.10. states that in larger vessels, the delay between the second stage and third stage may be set to a longer value on installation, up to a maximum of 3 min, to allow sufficient time for back-up officer and /or Master to reach the bridge

3.2.11. list and explain the resetting function of the BNWAS, which are as follows;

- it is not possible to initiate the reset or cancel any audible alarm from any device, equipment or system not physically located in areas of the bridge providing proper look out
- the reset function does, by a single operator action, cancel the visual indication and all audible alarms and initiate a further dormant period. If the reset function is activated before the end of the dormant period, the period is re-initiated to run for its full duration from the time of reset
- to initiate the reset function, an input representing a single operator action by the OOW is required. This input may be generated by reset devices forming an integral part of the BNWAS or by external inputs from other equipment capable of registering physical activity and mental alertness of the OOW
- a continuous activation of any reset device does not prolong the dormant period or cause a suppression of the sequence of indications and alarms

3.2.12. explains that the emergency call facility may be provided on the bridge to immediately activate the second, and subsequently third stage, remote audible alarms by means of an “Emergency Call” push button or similar

3.2.13. explains that the means of selecting the operational mode and the duration of the dormant period (Td) is security protected so that access to these controls should be restricted to the Master only

3.2.14. describes the limitation of the system

F1 - Module 4

Competence: ***Maintain safe navigation through the use of information from navigation equipment and systems to assist command decision-making***

1. **System errors and the operational aspects of modern navigation systems including Radar and ARPA**
2. **Blind Pilotage Planning**
3. **Evaluation of navigational information derived from all sources, including Radar and ARPA, in order to make and implement command decisions for collision avoidance and for directing the safe navigation of the ship**
4. **The interrelationship and optimum use of all navigational data available for conducting navigation**

Note: METIs to refer to IMO Model Courses 1.08 for Radar Navigation - Management Level; 1.22 Ship Simulator and Bridge Teamwork; 1.27 Operational Use of Electronic Chart Display and Information Systems (ECDIS); and 1.34 AIS Operator Course for more details of this module.

F1 - Module 5

Competence: ***Maintain the safety of navigation through the use of ECDIS and associated navigation systems to assist command decision-making***

1. **Command decision-making using the information provided by ECDIS and associated navigation systems, including:**
   - **1.1. Management of operational procedures, system files and data relating to ECDIS**
   - **1.2. Use of ECDIS playback functionality for passage review, route planning and review of system functions**

Note: METIs to refer to IMO Model Courses No. 1.27 Operational Use of Electronic Chart Display and Information Systems (ECDIS), IMO Model Course No 1.34 AIS Operator Course and STCW Reg. I/12 from the perspective of command decision making, 1.08 for Radar Navigation - Management Level and 1.22 Ship Simulator and Bridge Teamwork

F1 - Module 6

Competence: ***Respond to Navigational Emergencies***

1. Precautions when beaching a ship

1.1. Precautions when beaching a ship

1.1.1. describes the circumstances in which a vessel may be beached

1.1.2. states that a gently shelving beach of mud, sand or gravel should be chosen if possible

1.1.3. states that beaching should be at slow speed

1.1.4. states that, when trimmed heavily by the head, beaching stern first may be advantageous

1.1.5. compares the relative advantages of beaching broad side on and at right-angles to the beach

1.1.6. states that wind or tide along the shore will quickly swing the ship broadside-on to the beach

1.1.7. describes measures which can be taken to prevent the ship driving further ashore and to assist with subsequent re-floating

1.1.8. states that ballast should be added or transferred to counteract a tendency to bump on the bottom

1.1.9. states that all tanks and compartments should be sounded and an assessment made of damage to the ship

1.1.10. states that soundings should be taken to establish the depth of water round the ship and the nature of the bottom

2. Actions to be taken if grounding is imminent and after grounding

2.1. Grounding

2.1.1. states that, on stranding, the engines should be stopped, watertight doors closed, the general alarm sounded and, if on a falling tide, the engines should be put full astern to see if the ship will immediately re-float

2.1.2. states that the engineers should be warned to change to high-level water intakes

2.1.3. states that a distress or urgency signal should be transmitted and survival craft prepared if necessary

2.1.4. states that all tanks and compartments should be sounded and the ship should be inspected for damage

2.1.5. states that any discharge or probable discharge of harmful substances should be reported to the nearest coast radio station

2.1.6. states that soundings should be taken to establish the depth of water round the ship and the nature of the bottom

3. Refloating a grounded ship with and without assistance

3.1. Refloating

3.1.1. describes measures which can be taken to prevent further damage to the ship and to assist with subsequent re-floating

3.1.2. explains how ballast or other weights may be moved, taken on or discharged to assist re-floating

3.1.3. describes the use of ground tackle for hauling off

3.1.4. describes ways in which tugs may be used to assist in re-floating

3.1.5. describes the use of the main engine in attempting to re-float and the danger of building up silt from its use

4. Action to be taken if collision is imminent, after a collision or impairment of the watertight integrity of the hull by any cause

4.1. Action to be taken if collision is imminent and following a collision or impairment of the watertight integrity of the hull by any cause

4.1.1. lists the duties of the master following a collision

4.1.2. states that after impact the engines should be stopped, all watertight doors closed, the general alarm sounded and the crew informed of the situation

4.1.3. states that in calm weather the colliding ship should generally remain embedded to allow the other ship time to assess the damage or prepare to abandon ship

4.1.4. states that survival craft should be made ready for abandoning ship or assisting the crew of the other ship

4.1.5. states that a distress or urgency signal should be made, as appropriate

4.1.6. states that requests for information may be received from coastal States

4.1.7. states that, if not in danger, own ship should stand by to render assistance to the other for as long as necessary

4.1.8. states that any discharge or portable discharge of harmful substances should be reported to the nearest coast radio station

4.1.9. states that the owners should be informed and all details of the collision and subsequent actions entered in the log-book

5. Assessment of damage control

5.1. states that damage to own ship should be determined

5.2. describes measures to attempt to limit damage and salve own ship

6. Emergency steering

6.1. describes typical arrangements of auxiliary steering gear

6.2. describes how the auxiliary steering gear is brought into action

6.3. describes how to change from bridge control to local control in the steering gear compartment

6.4. states that, when appropriate, a disabled ship should report to a coastal State that it is a potential hazard to other ships or to the environment

6.5. lists possible course of action which may be taken by a disabled ship

6.6. states the navigational safety message to broadcast and signals to be displayed by a disabled vessel

7. Emergency towing arrangements and towing procedures

7.1. states that permission from the owners or charterers is usually required before towing, except for the purpose of saving life

7.2. states that a coastal State may intervene when a disabled ship presents a potential risk to the environment

7.3. states that early communication should be established between the vessels to agree on the method of connecting the tow

7.4. states that both vessels should have everything prepared and have agreed on communication before the arrival of the towing ship

7.5. describes how to approach a disabled vessel and pass the first connection by line throwing apparatus or other methods

7.6. states that the tow normally passes a messenger followed by a wire messenger to the towing vessel to haul across the towing line

7.7. describes how to pay out the towing wire under control

7.8. describes methods of securing the towing wire at the towing ship

7.9. explains why the wire is usually shackled to the anchor cable of the tow

7.10. describes the preparations made by the disabled ship

7.11. states that the towing wire should be protected from chafing at fairleads

7.12. states that wires and cables should be inspected frequently and the nip freshened if any sign of wear or chafe is found

7.13. describes how to take the weight of the tow

7.14. explains how the towing speed should be decided

7.15. describes how to disconnect the tow on arrival at the destination

7.16. describes the emergency towing arrangements for all tankers of not less than 20,000 dwt

F1 - Module 7

Competence: ***Maneuver and handle the ship in all conditions***

1. Maneuver and handle the ship in all conditions

1.1. Maneuvers when approaching pilot stations and embarking or disembarking pilots, with due regard to weather, tide, head reach and stopping distances

1.1.1. explains the importance and the procedure of making a passage plan from sea to berth
1.1.2. describes the preparations for picking up a pilot
1.1.3. states that a second steering-gear power unit should be in operation where possible
1.1.4. states that steering should be changed to manual in ample time and tested
1.1.5. states that anchors should be cleared and ready for letting go
1.1.6. explains how to reduce speed when approaching the pilot station, taking account of wind and tidal set
1.1.7. explains why the ship's speed should be reduced to a suitable speed for the pilot boat to come alongside
1.1.8. describes how to make a lee for the pilot boat
1.1.9. states that extra care should be taken after dropping the pilot until clear of inward ships maneuvering to embark pilots
1.1.10. plans maneuvers for the embarking and disembarking of pilots under varying environmental conditions
1.1.11. performs maneuvers to embark and disembark pilots in varying environmental conditions

1.2. Handling ship in rivers, estuaries and restricted waters, having regard to the effects of current, wind and restricted water on helm response

1.2.1. defines shallow water as a depth of less than 2 times the ship's draught
1.2.2. explains that shallow-water effects become more marked as the under-keel clearance decreases
1.2.3. lists shallow-water effects as:
- increased directional stability and sluggish response to helm
- the speed falls less during turns
- a large increase in turning radius
- a more pronounced effect from transverse propeller thrust
- a possibility that transverse thrust may act opposite to that expected

- the ship carries her way longer and responds slowly to changes in engine speed
- the trim changes, usually by the head for a full hull form
- an increase in squat

1.2.4. defines squat as the reduction of under-keel clearance resulting from bodily sinkage and change of trim which occurs when a ship moves through the water

1.2.5. calculates the approximate sinkage due to squat in deep water

1.2.6. states that the squat in shallow water (ratio of water depth/draught = 2) may be double that in deep water

1.2.7. states that squat in canals and restricted channels in proximity to other vessels may be significantly greater

1.2.8. uses a squat estimation diagram

1.2.9. explains the meaning of 'blockage factor' in restricted channels

1.2.10. explains how squat and trim effects increase with blockage factor

1.2.11. describes the reduction in keel clearance resulting from rolling and pitching and heel or list

1.2.12. states that speed should be moderate in rivers, estuaries, etc. to reduce shallow-water effects and to provide reserve power for correcting a sheer

1.2.13. describes how to round bends in a channel with a current in either direction, taking account of the effect of wind

1.2.14. describes the use of an anchor to assist in rounding a bend

1.2.15. describes how to turn short round in a narrow channel with or without a wind

1.2.16. describes the use of an anchor to assist turning in a channel

1.2.17. explains the importance of navigating at reduced speed to avoid damage caused by own ship's bow wave or stern wave

1.2.18. describes how a passing ship affects a moored ship

1.2.19. plans maneuvers in rivers, estuaries and restricted water in varying environmental conditions

1.2.20. performs maneuvers in rivers, estuaries and restricted water in varying environmental conditions

1.3. Application of constant rate of turn techniques

1.3.1. describes the circumstances in which a constant rate turn is appropriate

1.3.2. describes how to plan a constant rate turn

1.3.3. describes how to judge the correct execution of a constant rate turn by visual means

1.3.4. describes how radar can be used to assist in monitoring a constant rate turn

1.3.5. describes how to determine the wheel over position bearing for a constant rate turn

1.3.6. describes how a constant rate turn is effective in helping a vessel maintain its planned trail

1.3.7. plans turns using constant rate of turn techniques

1.3.8. performs turns using constant rate of turn techniques

1.4. Maneuvering in shallow water, including the reduction in under keel clearance caused by squat, rolling and pitching

1.4.1. describes the effect of squat on under-keel clearance, trim and vessel maneuvering characteristics

1.4.2. describes the changes in dynamic under-keel clearance Interaction between passing ships and between own ship and nearby banks (canal effect) when maneuvers are conducted in shallow water in conjunction with turning or the effects of sea and swell

1.4.3. describes the use of the kick-ahead to control the speed and direction of the vessel

1.4.4. explains how a ship will respond to helm before increasing speed when using a kick-ahead

1.4.5. identifies the danger of taking a sheer in shallow water and what corrective action can be taken

1.4.6. describes how tugs can be used to assist in maintaining slow speed control

1.4.7. describes how anchors can be used to assist in manoeuvring a vessel in shallow water

1.4.8. plans maneuvers to be conducted in shallow water with and without the effects of sea and swell

1.4.9. performs maneuvers in shallow water

1.5. Interaction between passing ships and between own ship and nearby banks (canal effect)

1.5.1. explains and describes the interaction between ship and shore

1.5.2. explains and describes the interaction between ships when meeting end-on

1.5.3. explains and describes the interaction between ships in an overtaking situation

1.5.4. explains the particular dangers of interaction when working close by other craft such as tugs

1.5.5. describes the pattern of pressure changes round the hull of a moving ship

1.5.6. explains the interaction between a ship and nearby banks (bank cushion and bank suction)

1.5.7. describes the interaction between passing ships

1.5.8. describes how to pass or overtake another ship safely in a narrow channel

1.5.9. explains that shoal patches may give rise to bank cushion or suction, resulting in an unexpected sheer

1.5.10. explains the possible effects on squat, trim and vessel manoeuvring characteristics with different blockage factors and speeds

1.5.11. plans maneuvers where ship to ship and ship to topography interaction are anticipated

1.5.12. performs maneuvers where ship to ship and ship to topography interaction are experienced

1.6. Berthing and un-berthing under various conditions of wind, tide and current with and without tugs

1.6.1. describes the effects of right- and left-handed propellers on maneuvering

1.6.2. describes the use of twin screws for maneuvering

1.6.3. explains the advantages and disadvantages of controllable-pitch propellers with regard to ship handling

1.6.4. describes the use of lateral thrusters

1.6.5. states that lateral thrusters cease to be effective above a certain speed, which has to be determined by trial

1.6.6. describes, with reference to ship type and trim, the likely effect of wind on a ship when moving ahead or astern and when stopped

1.6.7. explains how an anchor or anchors may be used to assist in maneuvering

1.6.8. describes the use of anchors for stopping in an emergency

1.6.9. describes the different ways in which tugs may be made fast and used

1.6.10. explains fully how to use engine, helm, tugs, anchors and mooring lines to berth and un-berth under various conditions of wind and tide at:

- river berths
- piers
- locks
- enclosed docks

- a single buoy
- two buoys
- multi-buoy berths
- Mediterranean moorings

1.6.11. describes the mooring lines to be used, their leads and methods of securing at the berths listed above

1.6.12. explains that when wind blows against a ship, a force acts almost in the opposite direction to the relative wind direction and the magnitude is proportional to the square of the relative velocity of the wind

1.6.13. states that knowing the magnitude of the wind force and how it affects the ship is of great importance during berthing / unberthing

1.6.14. explains that the knowledge of above mentioned magnitude, will assist the Master to:

- decide whether the available tugs have sufficient power to hold the ship against a cross wind or to move the ship against a crosswind;
- decide whether the thrusters have the necessary power to maneuver the ship safely under the prevailing wind conditions;
- determine the effect of a longitudinal wind in respect of its effect on the ship‘s stopping distance

1.6.15. explains that the wind force in tones may, with a certain approximation, be expressed by the formula:

$$K(wind) = k * A * V2$$

Where K= wind force in tones

k= Constant depending on the ship and direction of the wind (as an average figure for k, the following constants can be used: k= 0.52 * 10-4 (for a beam wind) and k= 0.39* 10-4 (for a longitudinal wind)

A= Windage area in sq.mtrs

V= Relative velocity of the wind in m/sec

1.6.16. explains that normally tugs cannot hold a ship against a cross current, as the power, which is necessary for such an operation, is enormous

1.6.17. explains that the force (K) required to oppose a cross current in deep waters might be determined approximately by the formula:

K = kdeep * L * d * V2

(Where K= Current force in tones, k= constant, 0.033 for deep water, L= Vessel length in meters, d= Vessel draft in meters and V = Current speed in m/sec)

1.6.18. explains that the force (K) required to oppose across current in shallow waters might be determined approximately by the formula:

$K = k_{deep} * L * d * V_2$ (where K= Current force in tones, k= constant, 0.033 for deep water, L= Vessel length in meters, d= Vessel draft in meters and V = Current speed in m/sec)

1.6.19. explains that the force (K) required to oppose across current in shallow waters might be determined approximately by the formula:

$K = 0.033 * f * L * d * V_2$

(where K= Current force in tones, 0.033 is the constant, f = the shallow water constant modifier derived from a graph, L= Vessel length in meters, d= vessel draft in meters and V = Current speed in m/sec)

1.6.20. plans maneuvers to berth and unberth in varying environmental conditions and with and without tugs

1.7. Ship and tug interaction

1.7.1. describes the type of tug, i.e. conventional single or twin-screw tugs fitted or not fitted with nozzles, tractor type tugs and the ASD (azimuth stern drive) tugs

1.7.2. describes the main difference resulting from the location of tug‘s propulsion and towing point

1.7.3. explains the dangers related to ship-tug interaction

1.7.4. explains the dangers for relatively small tugs when compared with the size of assisted ships in relation to interaction phenomenon

1.7.5. states the special attention to be paid by the master on the condition of own vessel, i.e. ships in ballast condition or for ships having particular overhanging stern, found generally on large container vessels, the danger of interaction which is created and the danger of damages that can be caused to the tug‘s hull and superstructure, during the ship-tug cooperation

1.7.6. explains the tug bow-cushion effect

1.7.7. explains the risk during the ship- tug co-operation of the tug getting sucked under the bow of the ship with risk of capsizing, and the importance of immediate action required by the tug master, by the application of rudder and the use of available power to go full astern, to avoid above

1.7.8. explain why tractor type tugs are generally found to be less vulnerable in the above mentioned situation

1.7.9. explains girting‘ and the dangers associated with it

1.7.10. explains the dangers of ships high speed during ship-tug co-operation

1.7.11. describes the meaning of gob rope‘, and how its use on conventional tugs can improve the situation of girting

1.7.12. explains how the use of such gob rope‘ limits the maneuverability of the towing tug

1.7.13. explains the precaution needed to be exercised for the tug‘s safety, while using the tugs, in respect to:

- the visibility of ship‘s bulbous bow
- short towlines
- excessive forward speed of the ship or sudden changes in a ship‘s heading and speed
- experience and the ability of the crew in releasing tug‘s towline, when needed
- underestimating wind and current forces
- information exchange pilot-shipmaster-tug captain
- operating bow-to-bow

1.7.14. explains the importance of keeping the ship‘s speed and heading constant when passing or taking a towline

1.7.15. explains the knowledge necessary for a master when ordering the number and total bollard pull of tugs

1.7.16. explains the important criteria of ships‘ loading conditions when planning for the number of tugs and the tug position along the hull

1.7.17. describes the effectiveness of Tug(s), during ship-tug co-operation, in relation to pivot point, leverage, and tendency of the ship to swing in a particular direction, in the following conditions:

- when the Ship is stopped and making no way through the water (dead in the water)
- when the Ship is making headway
- when the ship is making sternway

1.7.18. plans maneuvers involving tugs to minimize adverse interaction effects and optimize tug efficiency

1.8. Use of propulsion and maneuvering systems including various types of rudder

1.8.1. describes various types of udders, including:

- Flap Rudder (commonly known as the Becker rudder)
- Rotor Rudder (commonly known as the Jastram rudder)
- T- shaped Rudder (commonly known as the Single Schilling Rudder)
- Twin Schilling Rudders and explain their advantages with regard to ship handling

1.8.2. describes how the use of bow-thrust can be used to assist in maneuvering

1.8.3. describes how the use of stern-thrust can be used to assist in maneuvering

1.8.4. describes the use of high-lift rudder systems to improve ship maneuverability

1.8.5. describes the use of dynamically positioned vessels and their control systems

1.8.6. describes the use of rudder cycling to reduce head reach in an emergency

1.8.7. compares the effectiveness of rudder cycling with a crash stop

1.8.8. plans maneuvers using bow and stern thrusters

1.8.9. performs maneuvers using rudder cycling to control speed and bow and stern thrusters

1.9. Choice of anchorage; anchoring with one or two anchors in limited anchorages and factors involved in determining the length of anchor cable to be used

1.9.1. explains how to choose an anchorage and lists the factors which influence the choice

1.9.2. states that an anchoring plan should be prepared in advance, showing the direction and speed of approach and the dropping position(s), with check bearings

1.9.3. explains how to judge that a ship is stopped ready for letting go

1.9.4. explains that positions should be obtained on letting go and again when brought up

1.9.5. describes the use of anchor buoys

1.9.6. lists the factors to consider in determining the length of anchor cable to be used as:

- the nature of the bottom

- the strength of current or wind
- the strength and direction of the tidal stream
- the exposure of the anchorage to bad weather
- the amount of room to swing
- the expected length of stay at anchor

1.9.7. plans anchorage positions and maneuvers to anchor the vessel using one and two anchors

1.9.8. performs maneuvers to anchor the vessel using one and two anchors

1.10. Procedures for anchoring in deep water and in shallow water

1.10.1. describes holding powers of different Anchors

1.10.2. describes the preparation of anchors, including walking the anchor back for anchoring in deep water

1.10.3. explains that when lowering anchor under power, excessive load on the anchor cable could cause damage or wear of the windlass engine and gearing

1.11. Dragging anchor; clearing fouled anchors

1.11.1. defines dragging and explains how to detect it

1.11.2. describes the actions to be taken when the anchor starts to drag

1.11.3. explains how excessive yawing may break the anchor out of its holding and describes measures to control yaw

1.11.4. describes how to bring a ship to an open moor

1.11.5. explains what is meant by 'foul hawse' and how it occurs

1.11.6. describes how to clear a foul hawse

1.11.7. describes how to clear a fouled anchor

1.11.8. describes how to buoy and slip an anchor

1.12. Dry-docking

1.12.1. lists the information required by the dry-dock authorities as:

- length, beam and rise of floor, if any
- draughts and trim
- position of bilge keels and appendages such as a bulbous bow
- whether single or twin screw
- the weight and disposition of any cargo on board
- position of any hull damage for inspection or repair

1.12.2. states that a plan showing the position of bulkheads, main structural members and drain plugs is required for the preparation of beds and shores when dry-docking in the loaded condition

1.12.3. explains why a slight trim by the stern is the ideal condition for dry-docking

1.12.4. explains the need for adequate statical stability and states when the most critical condition occurs

1.12.5. determines that the vessel has adequate statical stability for docking by calculation

1.12.6. plans the distribution of deadweight items to ensure adequate statical stability during docking

1.12.7. describes the use of bilge blocks, breast shores and bilge shores and their placement during pumping out

1.12.8. states that all tanks should be sounded and the readings recorded when the ship takes the keel blocks

1.12.9. explains why, as far as possible, tanks should be full or empty

1.12.10. explains that tanks and movable weights should be restored to their original condition before flooding the dock to ensure the same trim and zero list on refloating

1.12.11. explains why a ship may be left partially waterborne if damage is accessible

1.12.12. explains how an adequate supply of water for fire fighting and a telephone for calling emergency services should be arranged

1.12.13. lists the precautions to be taken and the preparations to be made before flooding the dock

1.13. Management and handling of ships in heavy weather, including assisting a ship or aircraft in distress; towing operations; means of keeping an unmanageable ship out of trough of the sea, lessening drift and use of oil

1.13.1. states that the use of weather routeing can reduce the number of occasions on which heavy weather is encountered

1.13.2. explains that the most common reason for heavy weather damage is lack of proper route planning taking into consideration the 96 hrs, 72 hrs and 48 hrs forecasts during planning

1.13.3. describes the precautions to be taken before the onset of heavy weather

1.13.4. explains the importance of understanding the enormous stresses encountered by the ship in heavy weather conditions

1.13.5. defines wavelength, period and period of encounter of waves and swell

1.13.6. explains that high wave heights are one of the most common reasons for heavy weather damage

1.13.7. describes the methods of observing the frequency of wave beating and the formula with which it can be calculated (for ships less than 250m in length and for ships whose length exceeds 250m)

1.13.8. defines rolling period and synchronous rolling

1.13.9. explains how synchronous rolling can be avoided by an alteration of speed or course to change the period of encounter

1.13.10. describes synchronous pitching and how to prevent it

1.13.11. explains that parametric rolling is caused due to changes in parameters of stability which are; Displacement W (constant), Righting lever GZ (variable), W x GZ = righting moment

1.13.12. explains that parametric roll motions with large and dangerous roll amplitudes in waves are due to the variation of stability between the position on the wave crest and the position in the wave trough

1.13.13. explains that among the measures which the vessel can take to avoid parametric rolling and synchronous rolling are ensuring that the vessel has adequate intact stability and that the course and speed of the ship should be selected in a way to avoid conditions for which the encounter period is:

- close to the ship roll period or
- the encounter period is close to one half of the ship roll period.

1.13.14. describes how excessive speed into head seas can cause severe panting and slamming stresses

1.13.15. states that excessive slamming may be almost unnoticed on the bridge of a very large ship

1.13.16. explains that heavy pitching also gives rise to high longitudinal stresses, racing of the propeller and the shipping of water

1.13.17. defines 'pooping' and describes the conditions in which it may occur

1.13.18. defines 'broaching-to' and describes the conditions in which it may occur

1.13.19. explains that a reduction in speed combined with an alteration of course can reduce the danger of broaching-to and of being pooped

1.13.20. describes how to turn a ship in heavy seas

1.13.21. states that a ship may be hove-to with the wind on the bow or on the quarter or stopped

1.13.22. describes the circumstances in which each of the methods above may be used

1.13.23. describes methods of turning a disabled ship's head to keep it out of a sea trough and of lessening lee drift

1.13.24. explains that a ship may drift at an angle to the downwind direction and that its direction of drift will depend upon which side it has the wind

1.13.25. describes how to use oil to reduce breaking seas when hove-to and when maneuvering in heavy seas

1.13.26. describes actions to prevent a ship being driven on to a lee shore

1.13.27. describes how to assist a ship or aircraft in distress - describes towing operations

1.14. Precautions in maneuvering to launch rescue boats or survival craft in bad weather

1.14.1. explains how to make a lee for launching/recovering rescue and survival craft

1.14.2. describes the effect of speed and the effect of flow lines around the vessel

1.14.3. plans maneuvers to enable launching and recovery of rescue and survival craft

1.14.4. performs maneuvers to enable launching and recovery of rescue and survival craft

1.15. Methods of taking on board survivors from rescue boats and survival craft

1.15.1. describes the methods of maneuvering the ship and the precautions needed to take on board survivors from rescue boats and survival craft

1.16. Ability to determine the maneuvering and propulsion characteristics of common types of ships, with special reference to stopping distances and turning circles at various draughts and speeds

1.16.1. explains the IMO recommendations for ship maneuverability, which are:

- standards for Ship Maneuverability, adopted by Resolution MSC.137 (76) on 4 December 2002
- explanatory Notes to the Standards for Ship Manoeuvrability, adopted by MSC/Circ.1053 on 16 December 2002
- provision and Display of Manoeuvring Information on Board Ships, adopted by Resolution A.601 (15) on 19 November 1987

1.16.2. states in particular to IMO‘s recommendation, with respect to the turning ability of the ship, that the advance should not exceed 4.5 ship lengths and the tactical diameter should not exceed 5 ship lengths in the turning circle maneuver

1.16.3. states in particular to IMO‘s recommendation, with respect to the stopping ability of the ship, that the track reach in the full astern stopping test should not exceed fifteen ships length and also keeping in mind, as guided by the recommendation, that this value may be modified by the administration where ships of large displacement make this criterion impracticable but in no case exceed twenty ships length

1.16.4. states that opportunity should be taken to check and supplement the information in the ship's manoeuvring booklet for intermediate draughts and for various weather conditions

1.16.5. states that turning circles in shallow water at various manoeuvring speeds should be recorded when possible

1.16.6. states that details of an accelerated turn in shallow water should be obtained

1.16.7. explains how trials of stopping ability under various conditions should be recorded

1.16.8. states that the effect of wind on the behavior of the ship should be recorded, in particular:

- the drifting behavior when stopped
- the speed at which steerage is lost in various conditions of loading and wind
- the behavior of the ship when making stern way

1.16.9. states why the minimum operating revolutions of the engine and the resulting speed should be checked

1.16.10. states that any details of manoeuvring behavior which would be useful to a pilot or future master should be recorded

1.16.11. states that STCW Code Section B-V/a recommends additional training for masters and chief mates of large ships and ships with unusual maneuvering characteristics

1.17. Importance of navigating at reduced speed to avoid damage caused by own ship’s bow wave and stern wave

1.17.1. explains damage to shore due to excessive bow waves and stern waves

1.17.2. explains the effects of passing ships on ships moored alongside

1.17.3. states the precautions that should be taken by ships alongside to minimize the effect of passing traffic

1.18. Navigating in or near ice: practical measures to be taken when navigating in or near ice or in conditions of ice accumulation on board

1.18.1. states that all possible information about ice located on or in the vicinity of the intended track should be obtained

1.18.2. states that information is available from:

- daily bulletins of the International Ice Patrol in the N. Atlantic
- ice warnings from countries where ice is a regular problem
- Hydrographic Office ice charts
- pilot books
- facsimile ice charts
- warnings from other ships in the vicinity

1.18.3. defines the following terms used in ice warnings:

- solid ice
- soft ice
- drift ice
- pack ice
- growler
- iceberg

1.18.4. states the master's obligation to report dangerous ice or sub-freezing air temperatures associated with gale-force winds causing severe ice accretion on superstructures

1.18.5. states that, when ice is reported on or near the course, the master of every ship is bound to proceed at a moderate speed or to alter course so as to go well clear of the danger zone

1.18.6. explains that radar may not detect small icebergs and growlers

1.18.7. states that navigation marks may be removed without warning in coastal areas threatened by ice

1.18.8. states that no attempt should be made to enter a region of thick ice in a ship not specially strengthened for navigation in ice

1.18.9. lists precautions to take when entering ice as:

- estimating the thickness and concentration of ice and assessing whether the ship can safely pass through it
- avoiding entry to pressure areas (shown by hummocks and rafting)
- following leads used by previous ships, where possible

- entering on the lee side of the ice, if practicable
- entering at right angles to the ice edge, to avoid damage to hull, propeller and rudder
- approaching at as slow a speed as possible, and increasing the power to maintain headway when the bow contacts the ice

1.18.10. explains that leads through the ice show well on radar when set to short range

1.18.11. explains precautions to be taken to avoid damaging the propeller and rudder when maneuvering in ice

1.18.12. explains how to obtain assistance from an ice-breaker

1.18.13. states that it is important to follow the ice-breaker's instructions regarding speed and maneuvering

1.18.14. states that fenders should be ready for use when negotiating sharp turns in leads

1.18.15. describes the precautions which should be taken to prevent freezing up of tail-end shafts, deck machinery and services

1.18.16. describes how to heave-to in an ice field

1.18.17. describes the need to keep a look-out, when hove-to at night, for large ice drifting through the pack

1.18.18. states that soft ice may block seawater intakes

1.18.19. describes the conditions in which ice accumulates on decks and superstructures

1.18.20. explains the dangers resulting from heavy accumulation of ice

1.18.21. states that a change of course or speed should be made to reduce the shipping of freezing spray

1.18.22. states that accumulated ice and snow should be cleared away as quickly as possible

1.18.23. describes methods of clearing decks, rigging and superstructure of ice

1.19. Use of, and maneuvering in and near, traffic separation schemes and in vessel traffic service (VTS) areas

1.19.1. explains the requirements of the International Regulations for prevention of collisions at sea with respect to Traffic Separation Schemes and narrow channels

1.19.2. discusses the actions that can be taken to maneuver the vessel in case of emergency

1.19.3. describes the information that maybe required by VTS officers before entering leaving or manoeuvring within a VTS controlled area

1.19.4. plans maneuvers in and near traffic separation schemes

1.19.5. performs maneuvers in and near traffic separation schemes

FUNCTION 2

CARGO HANDLING AND STOWAGE AT THE MANAGEMENT LEVEL

FUNCTION CONTENTS

Function 2 (F2): Cargo Handling and Stowage at the Management Level

Part A: Course Framework

1. Scope
2. Learning Objectives
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3. Time Allocation for Each Topic
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2. F2 - Module 2: Assess reported defects and damage to cargo spaces, hatch covers and ballast tanks and take appropriate action

FUNCTION 2

PART A
COURSE FRAMEWORK

SCOPE
This Function covers the mandatory requirements for knowledge, understanding and proficiencies for *"Cargo Handling and Stowage at the Management Level"* as provided for under the 2010 STCW Manila Amendments, Regulation II/2 in relation to Section A-II/2, Table A-II/2 thereof. Topics in this function were also carefully selected following a course mapping based on the revised IMO Model Course 7.01 and the revised BSMT program under CMO No. 31, series of 2013, which now covers specific management level topics under this function.
LEARNING OBJECTIVES
Upon succesful completion of this Function, trainees shall be expected to have gained the minimum knowledge, understanding and proficiencies needed to carry out and undertake at the management level the tasks, duties and responsibilities for cargo handling and stowage on a ship of 3,000 gross tannage or more.
ENTRY STANDARDS
Entrants to this course must be Marine Deck Officers who are holders of COC under Regulation II/1 of the STCW '78 Convention, as amended and have not less than one (1) year of seagoing service as officer in charge of a navigational watch on ships of 500 gross tonnage or more.
COURSE INTAKE LIMITATION
▪ Trainees shall not exceed 24 students per class. ▪ Practical training using a full mission cargo handling simulator shall follow a man-machine ratio of 2:1 or 1:1 if using desktop cargo simulator.
STAFF REQUIREMENTS
Every METI offering this Management Level Course shall have a Training Supervisor, a minimum of two (2) instructors and an assessor for the course; subject the approval by the Administration in accordance with MARINA Circular (MC) No. 2013-03, as amended by MC 2013-12, series of 2013. The qualification requirements shall be as follows:

STAFF REQUIREMENTS *(Continued…)*

Training Supervisor

- Holder of at least a Bachelor of Science Degree;
- Have not less than one (1) year experience in maritime education and training;
- Have an understanding of the training course and the specific objectives of the training being conducted under his supervision; and
- Holder of a Certificate of Completion of Instructor's Training Course (IMO Model Course 6.09) or 18 earned units in teacher education covering teaching methodologies, test and measurement.

Instructors

- Management Level Deck Officer with not less than one (1) year of seagoing service in that capacity on board seagoing ship of 3,000 GT or more;
- Holder of a Certificate of Completion of Instructor's Training Course (IMO Model Course 6.09) or 18 earned units in teacher education covering teaching methodologies, test and measurement;
- Holder of a Certificate of Completion of the Management Level Course for Marine Deck Officers;
- Holder of a COC as Management Level Marine Deck Officer;
- Holder of a valid Professional Regulation Commission (PRC) License as Management Level Marine Deck Officer;
- If conducting training using simulator:
  - Must be holder of a Certificate of Completion of the "Train the Simulator Trainer and Assessor" (IMO Model Course 6.10), or approved Training Course for Simulator Instructors and Assessors; and
  - Have gained practical operational experience on the particular type of simulator being used.

STAFF REQUIREMENTS *(Continued…)*

Assessors

- Management Level Deck Officer with not less than one (1) year seagoing service in that capacity on board seagoing ship of 3000 GT or more;
- Holder of a Certificate of Completion of the Management Level Course for Marine Deck Officers;
- Holder of a valid PRC License as Management Level Marine Deck Officer;
- Holder of a Certificate of Completion of the Training Course in Assessment, Examination and Certification of Seafarers (IMO Model Course 3.12);
- Have gained practical assessment experience as understudy for not less than three (3) times;
- If conducting assessment involving the use of simulators:
  - Must be holder of a Certificate of Completion of the Train the Simulator Trainer and Assessor (IMO Model Course 6.10), or approved Training Course for Simulator Instructors and Assessors; and
  - Have gained practical assessment experience on the particular type of simulator being used under the supervision and to the satisfaction of an experienced Assessor for not less than three (3) times.

Resource Person

The METI may be allowed to engage the services of other persons with established expertise on particular topics, provided that the Administration shall be duly informed at least five (5) working days prior to engagement.

NOTE TO METIs:

The foregoing are the qualification standards that must be met by the Instructors, Assessors and Supervisor. In addition, METIs shall exercise utmost diligence and responsibility in the selection of such Staff and ensure that they are appropriately qualified to carry out effective teaching, assessment and supervision of the course, respectively.

TRAINING FACILITIES
For the theoretical part, a classroom with multi-media over-head projector, with a computer set, and a white board with eraser will be utilized, among others. This does not however preclude METIs from utilizing additional teaching aids to facilitate learning.
TRAINING EQUIPMENT
Cargo handling simulator duly certified by an internationally recognized Classification Society showing reference to STCW Table A-II/2, capable of simulating the required knowledge, understanding and proficiencies (KUPs) for cargo handling at the management level in the aforesaid Table. Other equipment and training materials to demonstrate required competences, with briefing and debriefing rooms, among others.
CERTIFICATE OF COURSE COMPLETION
Trainees who succesfully completed this Function and passed the assessment thereof, shall be issued a Certificate of Completion. The format of such certificate shall be in accordance with the format prescribed by the Administration.
SUGGESTED TEXT BOOKS AND REFERENCES
For the textbooks and reference materials, METIs should refer to the list of Teaching Aids, Videos, References, Textbooks and Bibliographies indicated in the revised IMO Model Course 7.01 validated during the 44th Session of the IMO's Sub-Committee on STW. This does not however preclude METIs from utilizing other relevant and more updated books and references that may be available or prescribed by the Administration. METIs shall also exercise prudence and utmost responsibility in selecting the textbooks and references for this Function to ensure that only relevant and up-to-date ones shall be utilized.

FUNCTION 2

PART B
COURSE OUTLINE

	MAIN TOPIC	**NO. OF HOURS**
Competence		
F2 - Module 1: Plan and ensure safe loading, stowage, securing, care during the voyage and unloading of cargoes		
1	Application of international regulations, codes, and standards concerning the safe handling, stowage, securing and transport of cargoes	6
2	Stability and trim diagrams and stress-calculating equipment	22
3	Stowage and securing of cargoes on-board ship, cargo handling gear and securing and lashing equipment	19
4	Loading and unloading operations, with special regard to the transport of cargoes identified in the Code of Safe Practice for Cargo Stowage and Securing	6
5	Knowledge of the operational and design limitations of bulk carriers	5
6	Loading, care and unloading of bulk cargoes	6
7	Safe cargo handling in accordance with the provisions of the relevant instruments	3
8	Effective communications and improving working relationship	1
Competence		
F2 - Module 2: Assess reported defects and damage to cargo spaces, hatch covers and ballast tanks and take appropriate action		
1	Limitations on strength of the vital constructional parts of a standard bulk carrier and interpret given figures for bending moments and shear forces	3
2	Methods to avoid the detrimental effects on bulk carriers of corrosion, fatigue and inadequate cargo handling	3
TOTAL FOR FUNCTION 2: Cargo Handling and Stowage at the Management Level		**74**

Geneal Rule on Time Allocation:

METIs must note that the number of hours allocated for the topics in this Function are the minimum and can be increased as may be necessary to cover new requirements, laws, rules and regulations, new developments, trends and practices in the maritime industry.

FUNCTION 2

PART C
COURSE SYLLABUS

F2 - Module 1

Competence: ***Plan and ensure safe loading, stowage, securing, care during the voyage and unloading of cargoes***

1. Application of international regulations, Codes, and standards concerning the safe handling, stowage, securing and transport of cargoes

1.1 Plans and actions conform with International Regulations

1.1.1 plans loading to comply with the Loadline Convention in terms of:
- freeboard,
- seasonal restrictions
- zones
- statical and dynamic stability requirements
- bunker requirements, and considers
- expected weather patterns

1.1.2 plans loading to comply with the IMO Intact Stability Code

1.1.3 plans cargo stowage and carriage in compliance with the Code of Safe Practice for Cargo Stowage and Securing

1.1.4 states that an approved cargo securing manual is required to be carried on board all ships except those engaged solely in the carriage of bulk cargoes

1.1.5 lists the information provided in the cargo securing manual

1.1.6 uses data from the cargo securing manual to plan securing a range of cargo types

1.1.7 lists the certificates required for inspection by port state control officers

1.1.8 plans loading and securing to comply in compliance with the Code of Practice for the Carriage of Timber Deck Cargoes

2. Use of stability and trim diagrams and stress-calculating equipment including automatic data-based equipment and knowledge of loading cargoes and ballasting in order to keep hull stress within acceptable limits

2.1 Shear Forces, Bending Moments and Torsional Moments

2.1.1 states that the carriage of loading calculators in large ships carrying dry or liquid cargo in bulk is a requirement of the classification societies

2.1.2 states that the maximum permissible values of shear force and bending moment in harbor and at sea are laid down by the classification societies

2.1.3 states that maximum torsional moments are also laid down for some container ships

2.1.4 describes the use of typical cargo loading instruments and lists the information obtainable from them

2.1.5 interprets the information regarding stress limits provided to the ship

2.1.6 explains that harbor stress limits should not be exceeded during loading, discharging or ballasting operations and that it is not sufficient just to finish within the limits

2.1.7 explains that sufficient information to arrange for the loading and ballasting of the ship in such a way as to avoid the creation of unacceptable stresses should be on board, unless the Administration considers it unnecessary for that ship

2.1.8 plans the loading and discharge of a ship to ensure that maximum allowable stress limits are not exceeded

2.2 Compliance with the Minimum Freeboard Requirements of the Load Line Regulations

2.2.1 uses the chart of zones and seasonal areas to determine the load lines which apply for all stages of a particular passage

2.2.2 plans the loading, discharge, and consumption of deadweight items to determine the minimum departure freeboards and maximum quantities to load in one or more loading ports to ensure that the vessel is not overloaded at any stage of a voyage through multiple loadline zones and seasonal zones

2.3 Use of Automatic Data Based (ADB) Equipment

2.3.1 provides an understanding of information obtained from ship stress indicators and loading programs

2.3.2 use stress indicators and loading programs in planning for the safe carriage of dry and liquid cargoes

2.3.3 advantages and limitations of analogue and digital stability and loading programs

2.4 Knowledge of loading cargoes and ballasting in order to keep hull stress within acceptable limits

2.4.1 explains the importance of devising a cargo stowage plan and loading / unloading plan

2.4.2 states that the officer in charge should always refer to the loading manual to ascertain an appropriate cargo load distribution, satisfying the imposed limits on structural loading

2.4.3 explains the stages of development of a safe cargo loading or unloading plan

2.4.4 explains that in any event if the cargo needs to be distributed differently from that described in the loading manual, calculations must always be made to determine, for any part of the voyage, that still water shear force (SWSF), still water bending moments (SWBM) and local loading limits are not exceeded

2.4.5 explains the reason to keep the hull stress levels below the permissible limits by the greatest possible margin

2.4.6 explains that when making a plan for cargo operations, the officer in charge must consider the ballasting operation, to ensure:

- correct synchronization is maintained with the cargo operations
- that the de-ballasting/ballasting rate is specially considered against the loading rate and the imposed structural and operational limits
- that ballasting and de-ballasting of each pair of symmetrical port and starboard tanks is carried out simultaneously

2.4.7 explains the importance to know the exact pumping rates achieved on board their ship to ascertain and ensure the plan are devised and modified accordingly

2.4.8 plans loading/de-ballasting operations within acceptable stress parameters

2.4.9 plans discharging/ballasting operations within acceptable stress parameters

3. Stowage and securing of cargoes on board ships, including cargo handling gear and securing and lashing equipment

3.1 Timber Deck Cargoes

3.1.1 outlines the contents of the Code of Safe Practice for Ships Carrying Timber Deck Cargoes with respect to:

- stowage of sawn timber, logs, cants and wood pulp
- fitting of uprights
- lashings and the arrangements for tightening them, including the use of a wiggle wire

3.1.2 states that vibration and movement of the ship in a seaway compacts the stow and slackens the lashings

3.1.3 states that lashings should be inspected regularly and tightened as necessary

3.1.4 states that inspections of lashings should be entered in the log-book

3.1.5 explains the dangers of heavy seas breaking aboard and how to minimize that risk

3.1.6 states the action to take if cargo is lost overboard or jettisoned

3.1.7 states the maximum height of cargo permitted on deck in a seasonal winter zone in winter

3.1.8 describes the controlling factors for height of cargo at other times

3.1.9 describes the requirements for fencing, for provision of walk-ways and for access to the top of the cargo

3.1.10 describes the requirements when loading to timber load lines

3.1.11 lists the stability information that should be available to the master

3.1.12 explains when the worst stability conditions during a voyage are likely to occur

3.1.13 describes the rolling period test for the approximate determination of a ship‘s stability and the limitations of the method

3.1.14 explains the actions to take in the event of the ship developing an angle of loll

3.1.15 plans the loading and securing of a timber deck cargo

3.2 Procedures for receiving and delivering cargo

3.2.1 states the period for which the ship is deemed responsible for the cargo under conventions for the carriage of goods and under typical carriage contracts evidenced by bills of lading or charter parties

3.2.2 states that damaged cargo should be rejected or steps taken to ensure that the damage is recorded and endorsed where appropriate on the bill of lading

3.2.3 explains that bills of lading may sometimes still be drawn up from mate‘s receipts and the importance of endorsing mate‘s receipts for the condition of goods and packages

3.2.4 describes the endorsement of mate‘s receipts and/or bills of lading for goods in dispute

3.2.5 describes the endorsement of mate‘s receipts and/or bills of lading for cargoes where the weight and quality are not known to the ship

3.2.6 explains the actions to take when a clean mate‘s receipt or bill of lading is demanded for cargo which is not in apparent good condition

3.2.7 explains why letters of indemnity offered in return for clean bills of lading should be refused

3.2.8 describes the documentation which should accompany dangerous goods and is required before loading

3.2.9 states that containers should have their seals and locks in place when loaded

3.2.10 states that, if damage to cargo is suspected, protest should be noted before commencing discharging

3.2.11 explains the procedure for noting protest and extending protest

3.2.12 states that an independent cargo survey should be arranged when cargo damage is suspected or found on opening hatches

3.2.13 states that broken or broached packages should be placed in a locker until the contents can be checked and agreed with a representative of the receiver and a receipt obtained for them

3.2.14 explains how to deal with empty bags or packages, sweepings and other loose goods

3.2.15 states that cargo spaces should be searched at the completion of discharging to prevent the over carriage of cargo

3.2.16 describes the procedure for claiming for damage done to the ship during loading or discharging

3.2.17 explains to whom cargo should be delivered

3.2.18 explains the potential consequences of delivering cargo to the incorrect party or under a letter of indemnity

3.2.19 explains the procedure that should be adopted when requested to deliver cargo against a letter of indemnity

3.3 Care of cargo during carriage

3.3.1 plans the loading and stowage of a hold or holds using a cargo list and reference books to take into account of the carriage requirements of the various cargoes

3.3.2 describes the precautions to avoid crushing and chafing damage and states which cargoes are most liable to be affected

3.3.3 explains how cargo may be damaged by residues of previous cargo, dirty dunnage or leaking fuel oil tanks

3.3.4 describes how cargo can be damaged by dust and the precautions to take when carrying commodities giving rise to dust

3.3.5 states which cargoes are particularly liable to damage by ship or cargo sweat and explains how to minimize the risk of sweat damage

3.3.6 explains that any goods containing liquids are liable to leak and describes the stowage required to prevent any leakage damaging other goods

3.3.7 states that many goods can be spoiled by extremes of temperature

3.3.8 explains that overheating may occur in cargo stowed against engine-room bulkheads, heated double-bottom tanks and deep tanks carrying heated cargoes

3.3.9 states that high temperatures also occur on the underside of steel decks exposed to tropical sunshine

3.3.10 describes how to protect cargoes which must be kept from freezing

3.3.11 describes the measures to take to prevent pilferage of cargo during loading, discharging and carriage

3.3.12 describes the damage to cargo which can result from the use of fork-lift trucks and similar machinery in cargo spaces and methods of preventing it

3.4 Requirements applicable to cargo-handling gear

3.4.1 outlines the requirements of ILO Convention 152, the Occupational Safety and Health (Dock Work) Convention, 1979, which apply to ships

3.4.2 defines the terms:

- competent person
- responsible person
- authorized person
- lifting appliance loose gear

3.4.3 states that national laws or regulations should prescribe measures to cover, amongst others:

- safe means of access to ships, holds, staging, equipment and lifting
- appliances
- opening and closing of hatches, protection of hatchways and work in holds
- construction, maintenance and use of lifting and other cargo- handling appliances
- rigging and use of ship‘s derricks
- testing, examination, inspection and certification, as appropriate, of lifting appliances, of loose gear (including chains and ropes) and of slings and other
- lifting devices which form an integral part of the load
- marking of cargo gear
- handling different types of cargo
- dangerous substances and other hazards in the working environment

3.4.4 describes the requirements for guarding dangerous parts of machinery

3.4.5 states that machinery includes mechanized hatch covers and lifting appliances

3.4.6 states the requirements for the marking of beams and portable hatch covers

3.4.7 states that only an authorized person, preferably a member of the ship‘s crew, should be permitted to open or close power-operated hatch covers and equipment such as doors in hull, ramps and car decks

3.4.8 describes the requirements for fencing of openings

3.4.9 describes the requirements for the testing of lifting appliances and loose gear before they are used for the first time

3.4.10 describes the requirements for periodic thorough examination and inspection of lifting appliances and loose gear

3.4.11 explains what is meant by a thorough examination

3.4.12 describes the records and certificates which should be kept in respect of tests, thorough examinations and inspections of lifting appliances and loose gear

3.4.13 describes the marking of safe working loads required on lifting appliances and loose gear

3.4.14 states that every ship must have a rigging plan and relevant information necessary for the safe rigging of derricks, cranes and accessory gear

3.5 Maintenance of cargo gear

3.5.1 prepares plans for the inspection of cargo gear

3.5.2 undertakes inspections of cargo gear so that any safety issues associated with machinery, structure, running and standing rigging and associated equipment is identified and addressed before use

3.5.3 maintains the records and plans required for the cargo gear

3.5.4 develops maintenance plans and procedures for the maintenance of machinery, structure, running and standing rigging and associated equipment of cargo gear, including blocks, shackles, wire and fiber ropes

3.5.5 provides instruction to crew and manages the maintenance of cargo gear

3.5.6 states the requirements for the annealing of wrought iron loose gear

3.5.7 describes the precautions to be taken when working aloft for the overhaul of cargo gear

3.6 Maintenance of hatch covers

3.6.1 states that track ways should be cleaned of loose material before closing hatches

3.6.2 states that the tension of draw chains should be adjusted as required

3.6.3 states that wheels, gears, racks and pinions and other moving parts should be kept lubricated

3.6.4 states that side cleats and cross-joint wedge mechanisms should be kept greased

3.6.5 explains that hydraulic systems should be checked for leakage, especially in between-decks where leaked fluid may damage cargo

3.6.6 states that drainage channels should be cleaned out and drainage holes checked on weather-deck hatches

3.6.7 describes how to check that compression bars are making complete contact with sealing gaskets

3.6.8 explains that weather tightness may be checked by hose-testing the covers before loading

3.6.9 prepares plans and procedures for the inspection and maintenance of hatch covers

4. Loading and unloading operations, with special regard to the transport of cargoes identified in the Code of Safe Practice for Cargo Stowage and Securing

4.1 Loading, stowage and discharge of heavy weights

4.1.1 explains how a load should be spread over an area of deck or tank top by the use of dunnage to avoid heavy point loading between beams and floors

4.1.2 states that special supports or cradles will need to be built for awkwardly shaped lifts

4.1.3 explains the use of shoring in a tween-deck to spread the load over a larger part of the ship‘s structure

4.1.4 states that the ship‘s stability should be checked to ensure that the resulting list will be acceptable

4.1.5 states that the weight of the lifting gear should be included in the weight of the lift, both for stability calculations and during consideration of safe working loads

4.1.6 explains why double-bottom tanks should be full or empty and the ship upright before starting to load or to discharge

4.1.7 states that additional stays may need setting up to a mast or kingpost

4.1.8 states that only experienced winch drivers should be allowed to handle heavy lifts

4.1.9 states that all movements should be controlled and steady, avoiding rapid stops and starts

4.1.10 describes methods of securing heavy lifts in the hold or on deck

4.2 Care of Cargo During Carriage

4.2.1 outlines the content of the Code of Safe Practice for Cargo Stowage and Securing

4.2.2 describes how to stow and secure containers on deck on vessels which are not specially designed and fitted for the purpose of carrying containers

4.2.3 describes the stowage and securing of containers and other cargo units in ships other than cellular container ships

4.2.4 describes the contents of the cargo-securing manual and its use

4.2.5 lists the elements to be considered by the master when accepting cargo units or vehicles for shipment

4.2.6 states that cargo spaces should be regularly inspected to ensure that the cargo, cargo units and vehicles remain safely secured throughout the voyage

4.2.7 describes the stowage and securing of road vehicles on ro-ro ships

4.2.8 describes recommended methods for the safe stowage and securing of:

- portable tanks
- portable receptacles
- wheel-based (rolling) cargoes
- coiled sheet steel
- heavy metal products
- anchor chains
- metal scrap in bulk
- flexible intermediate bulk containers
- unit loads

4.2.9 summarizes the guidelines for the under-deck stowage of logs

4.2.10 describes actions which may be taken in heavy weather to reduce stresses on securing arrangements induced by excessive accelerations

4.2.11 describes actions which may be taken once cargo has shifted

4.3 Methods and Safeguards When Fumigating Holds

4.3.1 Explains recommendations given in MSC.1/Circ.1264 - Recommendations on the Safe Use of Pesticides in Ships Applicable to the Fumigation of Cargo Holds, contained in the added supplement of the IMSBC code

4.3.2 explains the reasons for the control of pests

4.3.3 states that the control of rodents is required by the International Health Regulations

4.3.4 describes the methods for the prevention of insect infestation and states the areas to which particular attention should be given

4.3.5 explains how contact insecticides in the form of sprays, smokes or lacquers may be used by the crew for dealing with local infestation

4.3.6 states that all persons not directly involved in the application should be evacuated from the areas being treated for a period not less than that recommended by the manufacturer of the pesticide

4.3.7 states that extensive or hazardous treatments, including fumigation and spraying near human or animal food, should only be undertaken by expert operators

4.3.8 states that a fumigator-in-charge should be designated by the fumigation company or appropriate authority

4.3.9 lists the information about the fumigation which should be supplied to the master

4.3.10 states that fumigation of empty cargo spaces should always be carried out in port

4.3.11 states that crew should remain ashore until the ship is certified gas-free, in writing, by the fumigator-in-charge

4.3.12 states that a watchman should be posted to prevent unauthorized boarding and warning notices should be displayed

4.3.13 lists the precautions to be taken if essential crew members are permitted to return before aeration (ventilation) of the ship

4.3.14 states that entry to spaces under fumigation should never take place except in case of extreme urgency and lists the precautions to be taken if entry is imperative

4.3.15 states that fumigation in transit should only be carried out in ships approved for such process by the flag State Administration and that the application should be with the agreement of the port State Administration

4.3.16 states that fumigation in transit may be:

- treatment continued during the voyage in a sealed space in which no aeration
- has taken place before sailing
- continuation of in-port fumigation where some aeration has taken place but
- clearance cannot be issued because of residual gas and the cargo space has been re-sealed before sailing

4.3.17 states that precautions are the same in both cases

4.3.18 states that at least two members of the crew, including one officer, who have received appropriate training, should be designated as the trained representative of the master responsible for ensuring safe conditions after the fumigator-in-charge has handed over that responsibility to the master

4.3.19 states that the trained representative should brief the crew before a fumigation

4.3.20 lists the training which the designated representatives should have

4.3.21 lists the items which the ship should carry

4.3.22 describes the procedures for the fumigation and the handing over of responsibility from the fumigator in-charge to the master

4.3.23 describes the safety checks on gas concentration that should be made throughout the voyage and states that the readings should be entered in the log-book

4.3.24 describes the procedures to follow prior to and on arrival at the discharging port

4.3.25 describes the precautions to be taken during the discharge of cargo until the ship is certified free of fumigants

4.3.26 describes the procedures for the carriage of fumigated freight containers, barges and transport units that are loaded after fumigation without ventilation

4.3.27 states that the master should be informed prior to loading such freight containers, barges and transport units and that they should be identified with suitable warning labels showing the identity of the fumigant and the date and time of fumigation

4.3.28 describes the methods which may be used for the control of rodents

4.3.29 describes the use of baits by the ship‘s crew and the precautions to observe

4.3.30 explains that the use of pesticides is regulated by Governments, and their use may be limited by the regulations and requirements of:

- the country where the cargo is loaded or treated
- the country of destination
- the country of registration of the ship

4.3.31 describes the use of pesticides by the ship‘s crew and the precautions to observe

4.3.32 describes the measures to be taken if clothing becomes contaminated

4.3.33 states that, if contact insecticides are to be applied to grain during loading, the master should be provided with written instructions on the type and amount of insecticide to be used and on the precautions to be taken

4.3.34 states the actions to be taken in the event of exposure to insecticides resulting in illness

5. Knowledge of the operational and design limitations of Bulk Carriers

5.1 Operational and design limitations of bulk carrier

5.1.1 explains that the problems that are generally considered to be associated with bulk carriers includes, but is not limited to:

- high density cargoes, leading to loss of buoyancy or structural failure, if holds are flooded in the loaded condition
- high loading rate, leading to possible loss of control of load condition; with consequent high stresses

- vulnerability to internal damage during cargo loading and discharging operations, leading to protective coating damage, accelerated corrosion, and local structural failure
- low freeboard, leading to high green sea loads on deck structures
- vulnerability to flooding of forward holds
- rapid corrosion caused by corrosive cargo

5.1.2 minor damage to single sided ship structures or hatch covers can lead to hold flooding

5.1.3 explain that the nature of bulk cargoes can give rise to a number of problems

5.1.4 explains that cargoes such as coal produces gas and acidic conditions, high density cargoes produce large void spaces, and other cargoes can produce stability problems due to shifting or liquefaction

5.1.5 explains that loaded bulk carriers tend to have a low freeboard making forward hatches vulnerable to heavy seas

5.1.6 explains that a single hold flooding on a bulk carrier, particularly when loaded with high density cargoes, can have a severe adverse effect on stability and hull stresses

5.1.7 explains that the corrosive effects of some cargoes accelerate the rate of deterioration of internal structures

5.1.8 describes that ships can be more heavily stressed during ballast passage compared to loaded passage because the use of one or two ballast tanks leads to uneven weight distribution along the hull

5.1.9 states that hold cleaning, ballasting at sea and ballast exchange carried out at sea are vulnerable aspects of a ballast voyage for a bulk carrier

5.1.10 describes that improper cleaning during hold cleaning leads to accelerated corrosion and structural faults going unnoticed

5.1.11 states that additional hull stresses due to redistribution of ballast are imposed on the ship carrying out ballasting at sea and ballast water exchange which is required for operational and environmental reasons

5.1.12 explains that there is also a possibility of hull damage from sloshing‘ when ballasting at sea

5.1.13 states that this is also one of the reasons why some ships have been fitted with hull stress monitoring systems

5.1.14 explains why at shallow drafts ships in ballast are vulnerable to slamming with the consequent risk of bottom damage

5.1.15 explains why loading operation of a bulk carrier has been identified as an area of operations that can have immediate and long term affects on the structural integrity of the ship

5.1.16 describes that loading of bulk carriers requires the careful consideration of the loads imparted to the ship structure

5.1.17 explains that high density cargoes bring high local stresses, particularly in shear, if the vessel is block loaded and can also cause local damage and fatigue when being loaded

5.1.18 explains that loading at excessive speeds can cause high local stresses

5.1.19 describes that high loading rates make it difficult to monitor the amount of cargo being loaded

5.1.20 explains that continued over stressing has a cumulative effect with respect to fatigue

5.1.21 explains that discharging the cargoes causes similar problems to that of loading

5.1.22 describes that in addition to the problems associated with discharging, mechanical grabs, bulldozers, hydraulic hammers, and other machinery produce local damage and loading that can weaken the ship‘s structure

5.1.23 explains that ballasting operations during discharge can also

5.1.24 add to the stresses on the ship if not planned and executed properly

5.1.25 explains as with loading, the need of good coordination at the time of discharge and ballasting of the ship

5.1.26 explains the reason why maintenance and inspection play an important part in the safety of bulk carriers

5.1.27 explains that all ships are designed with limits deliberately imposed on their operations to ensure that structural integrity is maintained

5.1.28 explains that exceeding these limits may over-stress the structure and lead to catastrophic failure

5.1.29 explains that the ship‘s hull structure is designed to withstand the static loads of the ship‘s weight and sea water pressure on the hull and the dynamic loads on the hull due to waves and ship‘s motion

5.1.30 explains that overloading in any one cargo hold space will increase static stress in the hull structure and reduce the capability of the hull structure to withstand dynamic loads when the ship is at sea

5.1.31 explains that many bulk carriers are fitted with very large hatch openings to facilitate cargo loading and unloading and these openings may represent points of weakness in the hull since they reduce the torsional resistance of the hull

5.1.32 explains that when bulk carriers are loaded with dense and heavy cargoes such as iron, dense ores or steel products they rely on large empty spaces in holds, ballast tanks, voids and forward tanks as reserve buoyancy to stay afloat and if seawater enters any of these spaces due to damaged hull, hatches, accesses, ventilators or air pipes, the vessel can lose buoyancy and sink very quickly

5.1.33 explains the need for all crew on the ship to be aware that any loss of buoyancy in forward spaces due to flooding will reduce the freeboard forward and dramatically increase the forces of extreme weather on hull structures and hatches

5.1.34 explains why there is an urgent need for action if a ship takes on an unusual trim or heel, or if her motions become changed

5.1.35 explains the vulnerability of the bulkhead in bulk carriers between number 1 and 2 holds identified by IACS and IMO and the potential consequences of this failing

5.2 SOLAS Chapter XII Additional Safety Measures for Bulk Carriers

5.2.1 explains the regulations provided as Additional Safety Measures for Bulk Carriers in Chapter XII of the SOLAS convention which apply to bulk carriers of 150m in length and upwards, carrying high density dry bulk cargoes, including:

- damage stability and flotation,
- structure of bulkheads and double bottoms,
- overall longitudinal strength in the flooded state,
- strength and flooding requirements for carrying cargoes with densities of 1,000 kg/m3 or greater
- the bulkhead strength requirements for carrying cargoes of 1,780 kg/m3 or greater
- hold loading,
- cargo density declarations,
- provision of a loading instrument
- hold, ballast and dry space water ingress alarms
- availability of pumping systems
- restrictions from sailing with any hold empty
- the imposition of restrictions on loading higher density cargoes and homogenous loading in adjacent holds, including the endorsement of loading information and marking of the ship

5.2.2 explains that no bulk carrier over ten years old can carry a high density bulk cargo unless she has undergone either a periodical survey or a survey of her cargo holds to an equivalent extent, as required by regulation XII/7

5.3 CSR Bulk

5.3.1 explains that the IACS Common Structural Rules (CSR) are classification society rules covering structural requirements for Bulk Carriers and Tankers

5.3.2 states that IACS Common Structural Rules (CSR) Bulk which contains structural requirements are applicable for Bulk Carriers with L > 90 m signed for construction after 1 April 2006

5.3.3 explains that vessels built to CSR shall have overall safety of the hull structure equivalent to or better than that currently achieved by present rules

5.3.4 explains that the reasons for implementing of these rule are:

- to eliminate competition between class societies with respect to structural requirements and standards
- to employ the combined experience and recourses of all IACS societies to develop a single standard, or set of rules
- to fully embrace the intentions of the anticipated IMO requirements for goal based new construction standards
- to ensure that a vessel meeting this new standard will be recognized by the industry as being at least as safe and robust as would have been required by any of the existing rules

5.3.5 explains the general benefits of these rules

5.3.6 discusses the critical areas of weakness identified in bulk carrier and tanker structure and the requirements for enhanced inspection identified in these rule

6. Loading, care and unloading of Bulk Cargoes

6.1 Application of all available shipboard data related to loading, care and unloading of bulk cargoes

6.1.1 outlines and describes all relevant information to be appraised prior planning of loading a bulk cargo

6.1.2 outlines the relevant publications, IMO codes and recommendations that should be referred to prior loading a bulk cargo:

- SOLAS regulation VI/7 and the related code of practice for the safe loading and unloading of bulk carriers (BLU Code)

- International Maritime Solid Bulk Cargoes (IMSBC)
- International Code for the Safe Carriage of Grain in Bulk
- Code of Safe Practice for Cargo Stowage and Securing

6.1.3 explains the procedure for loading a bulk cargo in detail

6.1.4 prepares cargo stowage plans after carefully considering and assessing information such as seasonal load line zones, port restrictions, shipboard limits, e.g. draft, cargo capacity, stability, stresses and loading rates

6.1.5 explains that prior to loading bulk cargo, the shipper should declare characteristics & density, stowage factor, angle of repose, amounts and special properties of the cargo

6.1.6 explains that in preparing the vessel for a safe planning and cargo stowage, the loading and unloading sequences and other operational matters should be informed well in advance by the charterers / terminal

6.1.7 explains the content of the loading manual

6.1.8 explains that the consumption of ship's bunkers, consumption/generation of fresh water, during the voyage should be taken into account when carrying out the stress and displacement calculations

6.1.9 explains that loading and unloading sequences must consider the loading rate, the de-ballasting capacity and the applicable strength and draught limitations

6.1.10 plans the loading, care and unloading of bulk cargoes using the ship's approved loading manual and the typical information provided

6.1.11 describes the action that should be taken if the Master does not believe they have been provided with the required or correct information relating to the cargo to be loaded

6.1.12 describes the requirements for the carriage of loading instruments

6.1.13 describes the typical information that can be obtained from a loading instrument

6.1.14 explains the certification, testing and use of a loading instrument

6.1.15 utilizes a typical loading instrument to plan and monitor bulk carrier loading, ballast exchange and discharge operations

6.2 Code of practice for the safe loading and unloading of bulk carriers (BLU code)

6.2.1 outlines the contents of the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU code) in relation to:

- planning the sequence of operations
- communications and coordination between ship and terminal
- allocation of ships to appropriate terminals
- condition of ships and terminal equipment
- training of ship and terminal personnel
- requirement to be familiar with and comply with local regulations
- use of safety checklists
- responsibility of the Master
- additional considerations in relation to dangerous cargoes
- the use of the BLU Manual by terminal staff
- the impact of arrival and departure condition on maneuverability
- actions to minimize hull and local stress
- actions to take where acceptable hull and local stress levels may be exceeded

7. Safe cargo handling in accordance with the provisions of the relevant instruments

7.1 Establish procedures for safe cargo handling in accordance with the provisions of the relevant instruments such as: IMDG Code; IMSBC Code; MARPOL 73/78, Annexes III and V

7.1.1 Explain the procedures that should be followed for accepting solid bulk cargoes, packaged dangerous goods and marine pollutants for shipment in terms of:

- the required documentation
- ensuring that the condition and labeling of the goods are fit for carriage
- ensuring that the vessel is able to safely stow the cargo in terms of vessel certification, the ability to achieve separation and segregation requirements and the availability of any particular safety equipment that might be required

7.1.2 Develops stowage plans for cargoes that contain multiple packaged dangerous goods and ensure that separation and segregation requirements of IMDG, IMSBC and MARPOL are achieved

7.1.3 Prepares dangerous goods manifests and stowage plans in accordance with IMDG requirements

7.1.4 Discusses the preparations and precautions that should be taken prior to the handling of bulk cargoes, packaged dangerous goods and marine pollutants in terms of:

- preparation of spaces
- mooring of the ship
- information exchange and communication with port and regulatory authorities
- flag and light signals
- provision of emergency, fire and protective equipment

7.1.5 Identifies the appropriate action to take in case of general and medical emergencies involving packaged dangerous goods using the EMS and MFAG guidance of the IMDG Code

7.1.6 Discusses the risks that might be created by undeclared dangerous goods or goods that are not packaged or separated/segregated in accordance with the IMDG Code

7.1.7 Explains that the loading and discharge of dangerous goods, bulk cargoes and marine pollutants may be subject to port and national regulations in loading and discharge ports in addition to the requirements of the IMO codes

7.1.8 explains that there are procedures also given in the safety management system for the reporting of incidents involving the loss, or likely loss of harmful substances

7.1.9 states that the ship carrying marine pollutants should have a special list or manifest or detailed plan showing the location of these goods as per MARPOL Annex III/4(3)

7.1.10 states that the master and chief mate should ensure that marine pollutants are stowed in the location specified in the special list or manifest or detailed plan

7.1.11 states that the master and chief mate should ensure that when marine pollutants or any other dangerous goods are loaded on their ship, they must be stowed as required by Chapter 7.1, Section 7.1.4 of the IMDG Code in order to comply with MARPOL Annex III/5

7.1.12 states that the information provided on the special list or manifest should be compliant with section 5.4.3 of the IMDG code as per MARPOL Annex III/4(3)

7.1.13 states that to avoid accident which may lead to marine pollution, the master and chief mate should take note that marine pollutants should not be placed on the outer row or out board stow at the side of the ship. In addition, if they are stowed on deck, they should be located in such a way that any leakage will not escape into the sea and containers are not in exposed location where they may be damaged by the action of the sea or weather

7.1.14 states that as given in MARPOL Annex III/5, the master and chief officer should ensure that when marine pollutants or any other dangerous goods is carried on their ship, the stowage and securing must be in accordance with the requirements of the Document of Compliance (DOC) and approved Cargo Securing Manual (CSM)

7.1.15 states that that the disposal of dry bulk cargo residues is regulated by the requirements of MARPOL Annex V which governs garbage disposal at sea

7.1.16 states that as per the guidelines given in MARPOL Annex V, cargo-associated waste means all materials which have become wastes as a result of use on board a ship for cargo stowage and handling and this includes but is not limited to dunnage, shoring, pallets, lining and packing materials, plywood, paper, cardboard, wire, and steel strapping

7.1.17 states that as per the guidelines given in MARPOL Annex V, operational wastes means all cargo-associated waste and maintenance waste, and cargo residues

7.1.18 states that as per the guidelines given in MARPOL Annex V, cargo residues, expected to be in small quantities, are defined as the remnants of any cargo material on board that cannot be placed in proper cargo holds (loading excess and spillage) or which remain in cargo holds and elsewhere after unloading procedures are completed (unloading residual and spillage)

7.1.19 states that this means that under the terms of MARPOL 73/78, discharge of cargo residues, except in limited safety circumstances, is prohibited until the ship is more than twelve nautical miles from the nearest land

7.1.20 states that minimization of cargo residue wash down and discharge should form part of the ship‘s Garbage Management Plan and all residue discharges should be recorded as garbage category 4

7.1.21 states that discharges of cargo residues also require start and stop positions to be recorded in the Garbage record book

7.1.22 states that cargo materials contained in the cargo hold bilge water is not treated as cargo residues provided that the cargo material is not classified as a marine pollutant in the IMDG Code and the bilge water is discharged from a loaded hold through the vessel‘s fixed piping bilge drainage system

7.1.23 explains that cargo residues are created through inefficiencies in loading, unloading and on-board handling

7.1.24 states that as cargo residues fall under the scope of these guidelines provided by MARPOL annex V, it may, in certain cases, be difficult for port reception facilities to handle such residues and is therefore recommended that cargo be unloaded as efficiently as possible in order to avoid or minimize cargo residues

7.1.25 states that spillage of the cargo during transfer operations should be carefully controlled, both on board and from dockside and since this spillage typically occurs in port, it should be completely cleaned up prior to sailing and either delivered into the intended cargo space or into the port reception facility

7.1.26 states that areas on the ship where spillage is most common should be protected such that the residues are easily recovered

8. Effective communications and improving working relationship

8.1 Basic principles for establishing effective communications and improving working relationship between ship and terminal personnel

8.1.1 explains the necessity for effective communication and working relationships between ship and terminal

8.1.2 outlines and describes the information that should be exchanged between the ship and terminal:

- prior to ship‘s arrival
- when arriving in a part loaded condition or with residues
- for combination carriers (OBO or O/O)
- in relation to the readiness of holds to load cargo
- in ensuring that the plan and understanding of the operation is up to date and shared by both the ship and terminal
- ensuring that the cargo declaration as required by chapter VI of SOLAS 1974 is completed
- provisions for changing loading or unloading plans

8.1.3 states that the loading plans should be kept by the ship and terminal for a period of six months

Competence

F2-Module 2: Assess reported defects and damage to cargo spaces, hatch covers and ballast tanks and take appropriate action

1. Limitations on strength of the vital constructional parts of a standard bulk carrier and interpret given figures for bending moments and shear forces

1.1 states that the longitudinally continuous upper deck of a bulk carrier suffers hull girder stress

1.2 explains that the longitudinal bending causes an axial force on the upper deck that may cause cracking of the deck plate at the locations where the stress is concentrate

1.3 states that bulk carriers have cargo hatchways for the convenience of cargo-handling facilities

1.4 explains that these hatchways reduce the ship‘s torsional strength and invite concentrated stress at the hatchway corners which may be evident by cracking of the deck plates in these areas

1.5 states in this regard upper deck plating at hatchway corners is one of the focal points for cracking

1.6 explains that cross-deck strips come under stress by transverse bending

1.7 explains that the transverse bulkheads provide transverse strength to a bulk carrier and the cross-deck strips provide the strength to withstand the resultant axial forces in a transverse direction

1.8 explains that there are various types of cracking in the upper deck

1.9 states that those propagating from the cargo hatchways are generally considered serious to the ship‘s safety

1.10 explains that various metal fittings are welded to the upper deck plating and these installations may cause stress concentrations at the welded joints or have defects in the welds

1.11 states that deck platings in the vicinity of manholes, hatch side coaming end brackets, bulwark stays, crane post foundations and deck houses, etc. are to be carefully watched for cracking

1.12 states that hatch coamings are subjected to hull girder stress

1.13 explains that although they are not critical longitudinal strength members, they should be watched carefully to ensure that these cracks do not spread

1.14 states that the area around the corners of a main cargo hatch can be subjected to high cyclical stress due to the combined effect of hull girder bending moments, transverse and torsional loading

1.15 explains that discontinuous cargo hatch side coamings can be subjected to significant longitudinal bending stress

1.16 explains that this introduces additional stresses at the mid-length of hatches and stress concentrations at the termination of the side coaming extensions

1.17 explains that hatch cover operations, in combination with poor maintenance, can result in damage to cleats and gasket, leading to the loss of weathertight integrity of the hold spaces

1.18 states that damage to hatch covers can also be sustained by mishandling and overloading of deck cargoes

1.19 states that the marine environment, the humid atmosphere due to the water vapor from the cargo in cargo holds, and the high temperature on deck and hatch cover plating due to heating from the sun may result in accelerated corrosion of plating and stiffeners making the structure more vulnerable to the exposures described above

1.20 states that when carrying out visual inspection, special attention should be paid to areas where pipes, e.g. fire main pipes, hydraulic pipes and pipes for compressed air, are fitted close to the plating, making proper maintenance of the protective coating difficult to carry out

1.21 states that cracking may be initiated at defects in welded joints and metal fittings to the coamings that will invite stress concentration

1.22 states that such cracking is considered serious to the ship‘s safety because it may be the initiation of a fracture on a large scale

1.23 states that on typical bulk carriers, the topside and bilge hopper tanks compose a double hull surrounding the cargo space, which together with the double bottom provides hull strength and rigidity

1.24 states that if corrosion and waste become excessive, failure of hold frames invites additional loads to the adjacent ones, which may lead to failure throughout the side shell structure

1.25 explains that the transverse bulkheads may also be susceptible to accelerated corrosion, particularly at the mid height and at the bottom

1.26 states that particular care should be exercised when inspecting hold frames

1.27 states that the transverse bulkheads, in that these members may appear in deceptively good condition

1.28 states that the tank top and side shell plating generally corrodes from the steel surface facing the cargo hold and corrosion from inside the double bottom is usually less than that from the cargo hold side

1.29 states that cargo hold frames should also be carefully inspected for mechanical damage, corrosion and waste, because many cargoes will damage hold frames through direct contact

1.30 states that this damage will invite corrosion from seawater brought on board in loading operations

1.31 states that the most important aspects of cargo hold inspections are the condition of side shell structures and their reinforcements

1.32 states that special attention should be paid to the condition of hold frames and their connection to the shell plating

1.33 outlines and describes the common damage/defects that may occur on watertight transverse bulkheads situated at the ends of dry cargo holds of a bulk carrier

1.34 states that cracks may often be found at or near the connection of the stool of the transverse bulkhead and the tanktop in bulk carriers having combination cargo/ballast holds

1.35 states that wastage/corrosion may affect the integrity of steel hatch covers and the associated moving parts, e.g. cleats, pot-lifts, roller wheels, etc

1.36 explains that deformation/twisting of exposed structure above deck, such as side-coaming brackets and bulwarks, may result from impact due to improper handling of cargo and cargo handling machinery

1.37 explains that such damages may also be caused by shipping of green sea water on deck in heavy weather

1.38 outlines and describes other fractures that may occur in the deck plating at hatches and in connected coamings

1.39 outlines and describes the damages caused by cargoes in cargo holds, especially to tanktop plating and side:

1.39.1 at loading and unloading ports for coal or iron ore, large grab buckets, high-capacity cargo

1.39.2 loaders, bulldozers and pneumatic hammers may be employed for cargo-handling operations

1.39.3 large grab buckets may cause considerable damage to tank top plating when being dropped to grab cargo

1.39.4 use of bulldozers and pneumatic hammers may also be harmful to cargo hold structures and may result in damage to tank tops, bilge hoppers, hold frames and end brackets

1.39.5 lumber cargoes may also cause damage to the cargo hold structures of smaller bulkers that are employed in the carriage of light bulk cargoes and lumbers

1.40 states that side stringers and/or side shells in way of No. 1 cargo hold along the collision bulkhead are often found cracked

1.41 explains that this kind of damage is considered to be caused by insufficient continuity between forepeak construction and cargo hold structure

1.42 explains that on large bulk carriers such as capsize and panamax bulkers, bilge hopper plating around the knuckle line may be cracked along the bilge hopper transverse webs

1.43 states that this is considered to be caused by insufficient local reinforcement

1.44 states that though the water ballast tanks of newer bulk carriers are well protected against corrosion, the upper portion is susceptible to corrosion because the protective coating will easily deteriorate due to heat from the upper deck and the cyclic wet/dry effect of seawater

1.45 states that cracks may be found at the intersections of longitudinal and transverse members

1.46 states that cracks may be found in the side, bottom and/or tank top longitudinal at intersections with solid floors or bilge hopper transverses

1.47 states that cracks also may be found in the floors or transverses occurring at the corners of the slots cut for longitudinal

1.48 states that longitudinal may be cracked at the ends of additional (partial) side girders provided in the double bottom below cargo hold bulk heads or at the side walls of bilge wells for cargo holds, due to additional stress concentration caused by the structural discontinuity at those connections

1.49 states that cracks may be observed in transverse webs in bilge hoppers initiating from the slot openings for longitudinal and at the knuckled corners of the lower ends of the hoppers

1.50 states that corrosion accelerated by heat have been observed in double-bottom water ballast tanks adjacent to fuel oil tanks

1.51 states that in recent years, the grade of bunker oil being used requires the temperature in the tank to be 80°C or more and such a temperature can accelerate corrosion of the steel in the tanks, particularly in the vicinity of the boundaries of the fuel oil tanks

1.52 states that bottom plates are often eroded under the suction bellmouths in tank

1.53 states that a sounding pipe has a pad plate at its bottom end for protection of the tank bottom against the strike of the sounding scale‘s lead and extent of diminution of the protection plate should be examined during inspections

1.54 states that connection trunks provided between topside and bilge hopper spaces are to be carefully watched for signs of corrosion and waste of the steelworks inside

1.55 explains that on some bulk carriers, bilge hopper tanks and topside tanks form one integral tank connected with trunk spaces

1.56 states that the inside surface of a connection trunk is liable to corrosion and should be examined carefully

Interpret Given Figures for Bending Moments and Shear Forces

1.57 states that the bulk carriers are assigned 2 sets of permissible still water shear forces (SWSF) and still water bending moment (SWBM) limit to each ships, namely:

1.57.1 seagoing (at sea) SWSF and SWBM limits

1.57.2 harbor (in port) SWSF and SWBM limits

1.58 states that the seagoing SWSF and SWBM limits should not be exceeded when the ship is put to sea or during any part of a seagoing voyage

1.59 explains that in harbor, where the ship is in sheltered water and is subjected to reduced dynamic loads, the hull girder is permitted to carry a higher level of stress imposed by the static loads

1.60 states that the harbor SWSF and SWBM limits should not be exceeded during any stage of harbor cargo operations

1.61 explains that when a ship is floating in still water, the ship's lightweight (the weight of the ship's structure and its machinery) and deadweight (all other weights, such as the weight of the bunkers, ballast, provisions and cargo) are supported by the global buoyancy up thrust acting on the exterior of the hull

1.62 explains that along the ship's length there will be local differences in the vertical forces of buoyancy and the ship's weight and these unbalanced net vertical forces acting along the length of the ship causes the hull girder to shear and to bend, inducing a vertical still water shear force (SWSF) and still water bending moment (SWBM) at each section of the hull

1.63 explains that at sea, the ship is subjected to cyclical shearing and bending actions induced by continuously changing wave pressures acting on the hull

1.64 explains that these cyclical shearing and bending actions give rise to an additional component of dynamic, wave induced, shear force and bending moment in the hull girder

1.65 explains that at any one time, the hull girder is subjected to a combination of still water and wave induced shear forces and bending moments

1.66 explains that the stresses in the hull section caused by these shearing forces and bending moments are carried by continuous longitudinal structural members

1.67 explains that these structural members are the strength deck, side shell and bottom shell plating and longitudinals, inner bottom plating and longitudinals, double bottom girders and topside and hopper tank sloping plating and longitudinals, which are generally defined as the hull girder

1.68 states that over-loading will induce greater stresses in the double bottom, transverse bulkheads, hatch coamings, hatch corners, main frames and associated brackets of individual cargo holds, and it can be observed as:

1.68.1 increased stress in main frames and brackets

1.68.2 increased stress in double bottom structure

1.68.3 increased stress in transverse bulkhead

1.68.4 increased stress in cross deck strip

1.68.5 greater distortion of topside tank

1.69 states that exceeding the permissible limits specified in the ship's approved loading manual will lead to over-stressing of the ship's structure and may result in catastrophic failure of the hull structure

1.70 states that when deviating from the cargo load conditions contained in the ship's approved loading manual, it is necessary to ensure that both the global and local structural limits are not exceeded

1.71 explains that all officers should be aware over-stressing of local structural members can occur even when the hull girder still water shear forces (SWSF) and bending moments (SWBM) are within their permissible limits

1.72 analyses and interprets the causes and effects of shearing forces and bending moments on ship‘s structures

1.73 demonstrate the knowledge gained on the fore mentioned topics by interpreting given figures for bending moments and shear forces

2. Methods to avoid the detrimental effects on bulk carriers of corrosion, fatigue and inadequate cargo handling

2.1 states that deterioration of structure through corrosion, fatigue and damage is identified as a principal factor in the loss of many bulk carriers

2.2 states that failing to identify such deterioration may lead to sudden and unexpected failure

2.3 states that it is critical to inspect the cargo holds, ballast tanks and vital constructional parts of the bulk carriers, after every operation to ensure, rapid action can be taken if the inspection reveals any cracks, fracture or other damages

2.4 states that Internal degradation through corrosion may be accelerated through chemical action from certain cargoes

2.5 states that certain cargoes, including coal, phosphates and sulfur, transported by bulk carriers can rapidly corrode the hold side frames and promote fractures

2.6 states that the scouring effect of abrasive cargoes may cause hold coatings to deteriorate rapidly

2.7 explains that corrosive effects of some cargoes like coal which produces acidic conditions, accelerates the rate of deterioration of internal structures in cargo holds and welds in particular

2.8 explains that since bulk carriers tend to have low freeboard the uppermost continuous deck and other fittings including hatch covers are prone to exposure to green seas, which may again cause accelerated corrosion, and in some cases even structural damages which may again lead to catastrophic result, if not detected early and appropriate action taken

2.9 states that since improper cleaning during hold cleaning leads to accelerated corrosion all crew should be well trained for hold cleaning, and proper checks to be made after the holds have been cleaned, to ensure no remnants of previous cargo is left behind

2.10 states that in ballast holds, sloshing forces due to partially filled spaces, during ballast exchange at sea may result in damage to the structure and this damage may go unnoticed if it is in inaccessible positions, this has to be prone in mind while carrying out inspections

2.11 states that coatings are the first barriers to protect metal surfaces against corrosion

2.12 states that ballast exchange, especially for cargo hold, can also cause accelerated corrosion, if the hold has any exposed, unprotected steel surface

2.13 states that intact coatings prevent corrosion of the steel surface, however a local absence of coating (due to coating depletion, deterioration, damage, etc) can result in corrosion rates similar or greater than those of unprotected steel

2.14 states that periodic inspections at appropriate intervals and repair of coating as required are effective in minimizing corrosion damage

2.15 states that to ensure that such exposures are not neglected, all officers should be well trained in identifying and reporting to the chief officer or the Master

2.16 states that care should be taken, to tend any unprotected surfaces in cargo holds caused due to any reasons, after carefully examining the structure for any signs of fatigue or fracture

2.17 states that hold cleaning, ballasting at sea and ballast exchange carried out at sea are vulnerable aspects of a bulk carrier operation, and thus to avoid any kind of undue stress, proper, careful procedures, specified, in loading manual, ballast water management plan, among others should be followed

2.18 explains that, bulkheads, trunks and ballast tank boundaries in single side-skin bulk carriers, can present "hard spots" that concentrate forces where the change in construction occurs (e.g. longitudinal to transverse framing) that may lead to undetected fractures, hence careful examination at periodic intervals is necessary

2.19 states that damage to bow plating is possible through impacts associated with swinging or loosely stowed anchors may cause an initiating fracture or fatigue in bow shell plating that could lead to failure and subsequent flooding

2.20 states that internal integrity of forward spaces (that are usually used for ballast and/or stores) is therefore of vital importance

2.21 states that to prevent this from happening, the anchor must be fully hauled-in, stowed and retained in position by the lashing arrangement provided, ensuring there is three-point contact of anchor with the ship side at all given times

2.22 states that corrosion degradation will seriously reduce the ability of plating and stiffening to withstand the forces to which it will be subjected

2.23 states that any external forces - horizontal and/or vertical - may cause hatch cover dislodgement

2.24 states that the cargo hatchway, if it loses its protection in this way, is a major access for water ingress and a serious threat to the integrity of the hull

2.25 states that to ensure such thing does not happen, the hatch covers must be stowed, secured, battened down at all given times

2.26 states that metal fatigue is the progressive failure of metal under cyclic loading and as the name - fatiguell implies, it is a mode of degradation in which the steel is worked until it simply gets tired

2.27 states that bulk carriers are susceptible to many modes of cyclic forces that combine with other forces acting upon the vessel‘s structure and over time these cyclic stresses, can seriously weaken the vessel‘s structural capacity

2.28 states that fatigue failure may result due to loss of cross-sectional area in the plating joints

2.29 states the areas that are prone to fatigue cracks in the cargo holds, which have to be carefully examined during routine, periodic, scheduled inspections, are:

2.29.1 corrugated bulkhead

2.29.2 shedder plate

2.29.3 inner bottom longitudinal (tank top)

2.29.4 side frames

2.29.5 side longitudinal

2.29.6 hopper tank

2.29.7 lower stool

2.29.8 toes of the hatch coaming termination brackets

2.30 states that carriage of high density cargoes can cause buckling, structural deformities over a period of years, which can result in acceleration of corrosion and fatigue

2.31 states that many terminals have the practice of dislodging cargo from side shell, frames, hoppers using mechanical grabs, bulldozers, hydraulic hammers, and other machineries

2.32 states that these machineries produce local damage and loading that can weaken the ship‘s structure

2.33 states that precaution must be taken to ensure the terminals are instructed not to use any machinery which may cause damage, clearly, during the formal filling and agreeing as per the ship/shore checklist, contained in the BLU code, and duty officer‘s to be instructed to stop any such activities that may endanger the ship‘s structure, also bringing it to the attention of Master

2.34 states that buckling of plating caused due to high density cargoes, found generally on cargo hold tanktops, can lead to fractures or accelerated corrosion, if not inspected thoroughly

2.35 states that damage to side shell caused externally through contact with docksides or tugs and, internally from impact by cargo dislodging equipment during discharge, can result in initiating fractures and/or fatigue of the structure

2.36 states that careful examination is of prime importance after any such incidents, to assess the extent of damage and action required.

FUNCTION 3

CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD AT THE MANAGEMENT LEVEL

FUNCTION CONTENTS

Function 3 (F3): Controlling the Operation of the Ship and Care for Persons on Board at the Management Level

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FUNCTION 3

PART A
COURSE FRAMEWORK

SCOPE
This Function covers the mandatory requirements for knowledge, understanding and proficiencies for *"Controlling the Operation of the Ship and Care for Persons on Board at the Management Level"* as provided for under the 2010 STCW Manila Amendments, Regulation II/2 in relation to Section A-II/2, Table A-II/2 thereof. Topics in this function were also carefully selected following a course mapping based on the revised IMO Model Course 7.01 and the revised BSMT program under CMO No. 31, series of 2013, which now covers specific management level topics under this function
LEARNING OBJECTIVES
Upon succesful completion of this Function, trainees shall be expected to have gained the minimum knowledge, understanding and proficiencies needed to carry out and undertake at the management level the tasks, duties and responsibilities for controlling the operation of the ship and care of persons on board a ship of 3,000 gross tannage or more.
ENTRY STANDARDS
Entrants to this course must be Marine Deck Officers who are holders of Certificate of Competency (COC) under Regulation II/1 of the STCW '78 Convention, as amended and have not less than one (1) year of seagoing service as officer in charge of a navigational watch on ships of 500 gross tonnage or more.
COURSE INTAKE LIMITATION
▪ Trainees shall not exceed 24 students per class. ▪ Practical training using a full mission bridge simulator shall follow a man-machine ratio of 4:1
STAFF REQUIREMENTS
Every METI offering this Management Level Course shall have a Training Supervisor, a minimum of two (2) instructors and an assessor for the course; subject the approval by the Administration in accordance with MARINA Circular (MC) No. 2013-03, as amended by MC 2013-12, series of 2013. The qualification requirements shall be as follows:

STAFF REQUIREMENTS *(Continued…)*

Training Supervisor

- Holder of at least a Bachelor of Science Degree;
- Have not less than one (1) year experience in maritime education and training;
- Have an understanding of the training course and the specific objectives of the training being conducted under his supervision; and
- Holder of a Certificate of Completion of Instructor's Training Course (IMO Model Course 6.09) or 18 earned units in teacher education covering teaching methodologies, test and measurement.

Instructors

- Management Level Deck Officer with not less than one (1) year of seagoing service in that capacity on board seagoing ship of 3,000 GT or more;
- Holder of a Certificate of Completion of Instructor's Training Course (IMO Model Course 6.09) or 18 earned units in teacher education covering teaching methodologies, test and measurement;
- Holder of a Certificate of Completion of the Management Level Course for Marine Deck Officers;
- Holder of a COC as Management Level Marine Deck Officer;
- Holder of a valid Professional Regulation Commission (PRC) License as Management Level Marine Deck Officer;
- If conducting training using simulator:
  - Must be holder of a Certificate of Completion of the "Train the Simulator Trainer and Assessor" (IMO Model Course 6.10), or approved Training Course for Simulator Instructors and Assessors; and
  - Have gained practical operational experience on the particular type of simulator being used.

STAFF REQUIREMENTS *(Continued…)*

Assessors

- Management Level Deck Officer with not less than one (1) year seagoing service in that capacity on board seagoing ship of 3000 GT or more;
- Holder of a Certificate of Completion of the Management Level Course for Marine Deck Officers;
- Holder of a valid PRC License as Management Level Marine Deck Officer;
- Holder of a Certificate of Completion of the Training Course in Assessment, Examination and Certification of Seafarers (IMO Model Course 3.12);
- Have gained practical assessment experience as understudy for not less than three (3) times;
- If conducting assessment involving the use of simulators:
  - Must be holder of a Certificate of Completion of the Train the Simulator Trainer and Assessor (IMO Model Course 6.10), or approved Training Course for Simulator Instructors and Assessors; and
  - Have gained practical assessment experience on the particular type of simulator being used under the supervision and to the satisfaction of an experienced Assessor for not less than three (3) times.

Resource Person

The METI may be allowed to engage the services of other persons with established expertise on particular topics, provided that the Administration shall be duly informed at least five (5) working days prior to engagement.

NOTE TO METIs:

The foregoing are the qualification standards that must be met by the Instructors, Assessors and Supervisor. In addition, METIs shall exercise utmost diligence and responsibility in the selection of such Staff and ensure that they are appropriately qualified to carry out effective teaching, assessment and supervision of the course, respectively.

TRAINING FACILITIES
For the theoretical part, a classroom with multi-media over-head projector, with a computer set, and a white board with eraser will be utilized, among others. This does not however preclude METIs from utilizing additional teaching aids to facilitate learning.
TRAINING EQUIPMENT
A Full Mission Bridge Simulator certified as Class “A” or similar category showing reference to STCW Table A-II/2, by an internationally recognized Classification Society, capable of simulating a total shipboard bridge operation and can perform advanced maneuvering in restricted waterways including own ship capabilities for ships inter-action, bank suction and bank cushion, with briefing and debriefing rooms among others.
CERTIFICATE OF COURSE COMPLETION
Trainees who succesfully completed this Function and passed the assessment thereof, shall be issued a Certificate of Completion. The format of such certificate shall be in accordance with the format prescribed by the Administration.
SUGGESTED TEXT BOOKS AND REFERENCES
For the textbooks and reference materials, METIs should refer to the list of Teaching Aids, Videos, References, Textbooks and Bibliographies indicated in the revised IMO Model Course 7.01 validated during the 44th Session of the IMO’s Sub-Committee on STW. This does not however preclude METIs from utilizing other relevant and more updated books and references that may be available or prescribed by the Administration. METIs shall also exercise prudence and utmost responsibility in selecting the textbooks and references for this Function to ensure that only relevant and up-to-date ones shall be utilized.

FUNCTION 3

PART B
COURSE OUTLINE

MAIN TOPIC	**NO. OF HOURS**
Competence	
F3 - Module 1: Control trim, stability and stress	
1. Fundamental principles of ship construction, trim and stability	19
F3 - Module 2: Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, security and the protection of the marine environment	
1. International maritime laws embodied in international agreements and conventions	20
F3 - Module 3: Maintain Safety and Security of Ship's Crew and Passengers and the Operational Condition of Life-Saving, Fire-Fighting and Other Safety Systems	
1. Life-saving appliance regulations (SOLAS)	2
2. Actions to be taken to protect and safeguard all persons on board in emergencies	4
3. Actions to limit damage and salve the ship following a fire, explosion, collision or grounding	4
F3 - Module 4: Develop emergency and damage control plans and handle emergency situations	
1. Preparation of contingency plans for response to emergencies	9
2. Ship construction, including damage control	4
F3 Module 5: Use of Leadership and Managerial Skills	
1. Shipboard personnel management and training	16
2. Related international maritime conventions and recommendations, and national legislation	4
3. Application of task and workload management	8
4. Effective resource management	10
5. Decision-making techniques	7
6. Development, implementation, and oversight of standard operating procedures	1

Competence

F3 - Module 5: Organize and manage the provision of medical care on board

1. Medical Publications	**4**
1.1. International Medical Guide for Ships	
1.2 Medical Section of International Code of Signals (medical section)	
1.3 Medical First Aid Guide for Use in Accidents involving Dangerous Goods	

TOTAL FOR FUNCTION 3: Controlling the operation of the ship and care for persons on board at the management level	**112**

Geneal Rule on Time Allocation:

METIs must note that the number of hours allocated for the topics in this Function are the minimum and can be increased as may be necessary to cover new requirements, laws, rules and regulations, new developments, trends and practices in the maritime industry.

FUNCTION 3

PART C
COURSE SYLLABUS

F3 Module 1

Competence: Control trim, stability and stress

1. Fundamental principles of ship construction and the theories and factors affecting trim and stability

1.1 Shipbuilding Materials

1.1.1 states that steels are alloys of iron, with properties dependent upon the type and amounts of alloying materials used

1.1.2 states that the specifications of shipbuilding steels are laid down by classification societies

1.1.3 states that shipbuilding steel is tested and graded by classification society surveyors, who stamp it with approval marks

1.1.4 explains that mild steel, graded A to E, is used for most parts of the ship

1.1.5 states why higher tensile steel may be used in areas of high stress, such as the sheer strake

1.1.6 explains that the use of higher tensile steel in place of mild steel results in a saving of weight for the same strength

1.1.7 explains what is meant by:

- tensile strength
- ductility
- hardness
- toughness

1.1.8 defines strain as extension divided by original length

1.1.9 sketches a stress-strain curve for mild steel

1.1.10 explains:

- yield point
- ultimate tensile stress
- modulus of elasticity

1.1.11 explains that toughness is related to the tendency to brittle fracture

1.1.12 explains that stress fracture may be initiated by a small crack or notch in a plate

1.1.13 states that cold conditions increase the chances of brittle fracture

1.1.14 states why mild steel is unsuitable for the very low temperatures involved in the containment of liquefied gases

1.1.15 lists examples where castings or forgings are used in ship construction

1.1.16 explains the advantages of the use of aluminum alloys in the construction of superstructures

1.1.17 states that aluminum alloys are tested and graded by classification society surveyors

1.1.18 explains how strength is preserved in aluminum superstructures in the event of fire

1.1.19 describes the special precautions against corrosion that are needed where aluminum alloy is connected to steelwork

1.2 Welding

1.2.1 describes the process of manual electric arc welding

1.2.2 explains the purpose of flux during welding

1.2.3 describes briefly the automatic welding processes, electro-slag, TIG and MIG

1.2.4 describes butt, lap and fillet welds

1.2.5 describes the various preparations of a plate edge for welding

1.2.6 explains what is meant by a full-penetration fillet weld

1.2.7 explains what is meant by “single pass’, “multipass” and “back” run

1.2.8 explains how welding can give rise to distortion and describes measures which are taken to minimize it

1.2.9 describes the use of tack welding

1.2.10 describes weld faults:

- lack of fusion
- no inter-run penetration
- lack of reinforcement
- lack of root penetration
- slag inclusion
- porosity
- overlap
- undercut

1.2.11 states that classification societies require tests on weld materials and electrodes before approving them

1.2.12 discusses the electrode type and process of welding high tensile steels

1.2.13 describes gas cutting of metals

1.2.14 briefly describes the testing of welds:

- visual
- radiographic
- ultrasonic
- magnetic particle
- dye penetrant

1.3 Bulkheads

1.3.1 states that transverse bulkheads serve to subdivide a ship against flooding and spread of tire, to support decks and superstructures and to resist racking stresses

1.3.2 distinguishes between watertight, non-watertight and oil-tight or tank bulkheads

1.3.3 defines:

- margin line
- bulkhead deck
- watertight
- weather tight

1.3.4 states that cargo ships must have:

- a collision bulkhead, watertight up to the freeboard deck, positioned not less than 5% of the length of the ship (or 10 meters, whichever is the less) and not more than 8% of the length of the ship from the forward perpendicular
- an after peak bulkhead enclosing the stem tube and rudder trunk in a watertight compartment
- a bulkhead at each end of the machinery space

1.3.5 explains that cargo ships require additional bulkheads, as laid down by classification society rules, according to their length or as required by SOLAS

1.3.6 describes the construction of a watertight bulkhead and its attachments to sides, deck and tank top

1.3.7 describes how water tightness is maintained where bulkheads are pierced by longitudinal, beams or pipes

1.3.8 states the rule regarding penetrations of the collision bulkhead

1.3.9 states that watertight floors are fitted directly below main watertight bulkheads

1.3.10 explains that oil tight bulkheads and bulkheads forming boundaries of tanks are built with heavier scantlings than watertight bulkheads

1.3.11 describes how bulkheads are tested for tightness

1.3.12 gives examples of non-watertight bulkheads

1.3.13 explains the purpose of wash bulkheads in cargo tanks or deep tanks

1.3.14 states longitudinal bulkheads serve to subdivide liquid

1.3.15 cargoes, provide additional longitudinal support and reduce free surface effect

1.3.16 distinguishes between Cofferdam, Flat plate and Corrugated bulkhead construction

1.3.17 explains the use of cross ties in tanker construction

1.4 Watertight and Weather tight doors

Explains the general design and construction features of SOLAS compliant vessels in terms of watertight integrity

1.4.1 explains the possible effects of sustaining damage when in a less favorable condition

1.4.2 states that the number of openings in watertight bulkheads of passenger ships should be reduced to the minimum compatible with the design and working of the ship

1.4.3 categorizes watertight doors as:

- class 1 — hinged doors
- class 2 — hand-opened sliding doors
- class 3 — sliding doors which are power-operated as well as hand-operated

1.4.4 states that all types of watertight doors should be capable of being closed with the ship listed to 15° either way

1.4.5 describes with sketches the arrangement of a power operated sliding watertight door

1.4.6 describes with sketches a hinged watertight door, showing the means of securing it

1.4.7 states that hinged watertight doors are only permitted above a deck at least 2.0 meters above the deepest subdivision load line

Cargo Vessels

1.4.8 distinguishes between ships of Type “A” and Type “B” for the purposes of computation of freeboard

1.4.9 describes the extent of damage which a Type “A” ship of over 150 meters length should withstand

1.4.10 explains that a Type “A” ship of over 150 meters length is described as a ‘one- compartment ship

1.4.11 describes the requirements for survivability of Type “B” ships with reduced freeboard assigned

1.4.12 summarizes the equilibrium conditions regarded as satisfactory after flooding

All Ships

1.4.13 states that openings in watertight bulkheads must be fitted with watertight doors

1.4.14 explains that weather tight doors in superstructure openings are similar to hinged watertight doors

1.4.15 states that drills for the operating of watertight doors, side scuttles, valves and other closing mechanisms must be held weekly

1.4.16 states the requirements for watertight openings to be closed at sea

1.4.17 discusses procedures for ensuring that all watertight openings are closed

1.4.18 states that all watertight doors in main transverse bulkheads, in use at sea, must be operated daily

1.4.19 states that watertight doors and their mechanisms and indicators, all valves the closing of which is necessary to make a compartment watertight and all valves for damage-control cross-connections must be inspected at sea at least once per week

1.4.20 states that records of drills and inspections are to be entered in the log, with a record of any defects found

1.5 Corrosion and its Prevention

1.5.1 explains what is meant by corrosion

1.5.2 explains what is meant by erosion of metals and gives examples of where this is likely to occur

1.5.3 describes the formation of a corrosion cell and defines anode, cathode and electrolyte

1.5.4 states that corrosion takes place at the anode while the cathode remains unaffected

1.5.5 describes the galvanic series of metals in seawater

1.5.6 given the galvanic series, states which of two metals will form the anode in a corrosion cell

1.5.7 explains the differences in surface condition or in stress concentration can give rise to corrosion cells between two areas of the same metal

1.5.8 states that corrosion can be controlled by:

- applying a protective coating to isolate the steel from the air or from seawater electrolyte
- using cathodic protection to prevent steel from forming the anode of a corrosion cell

1.5.9 explains that cathodic protection can only be used to protect the underwater hull or ballasted tanks

1.5.10 states that both of the methods mentioned above are normally used together

1.5.11 explains what mill scale is and states that it is cathodic to mild steel

1.5.12 describes the treatment of steel in a shipyard and the use of holding primers (shop primers)

1.5.13 explains that the required preparation of steelwork depends upon the type of paint to be applied

1.5.14 states that many modem paints, such as epoxy and polyurethane, need to be applied to a very clean shot-blasted surface

1.5.15 states that paints consist mainly of a vehicle, a pigment and a solvent, and explains the purpose of each

1.5.16 explains the suitability of the following paint types for various applications as:

- drying oils
- oleo-resins
- alkyd resins
- polymerizing chemicals
- bitumen

1.5.17 describes the action of anti-fouling paint

1.5.18 describes the use of self-polishing anti-fouling paint

1.5.19 explains the ban on harmful types of antifouling paint

1.5.20 describes typical paint schemes for:

- underwater areas
- boot topping
- topsides
- weather decks
- superstructures
- tank interiors

1.5.21 states the safety precautions to take when using paints

1.5.22 describes the system of cathodic protection using sacrificial anodes

1.5.23 lists the metals and alloys which may be used as anodes

1.5.24 explains why anodes of magnesium and of magnesium alloy are not permitted in cargo/ballast tanks and in adjacent tanks in tankers

1.5.25 states that good electrical contact between the anode and the hull or tank is essential

1.5.26 describes the impressed-current system of hull protection

1.5.27 explains that the system is adjusted for optimum protection, often automatically, by use of a reference cell

1.5.28 states that electrical connection with the hull via slip rings and brushes on the rudder stock and propeller shaft ensures protection of the rudder and propeller

1.5.29 explains that, as the underwater paintwork deteriorates, higher currents are required for protection

1.5.30 states that too high a current can result in damage to paintwork and a chalky deposit on areas of bare metal, which has to be removed before repainting can be carried out

1.5.31 states that a protective shield of epoxy resin is applied for about 1 meter around the anodes to withstand the alkaline conditions there

1.6 Surveys and Dry-docking

1.6.1 states the frequency of classification society surveys

1.6.2 states that intervals between dry-dockings may be extended up to 2.5 years where a ship has high-resistance paint and an approved automatic impressed- current cathodic protection system

1.6.3 states that continuous hull survey, in which all compartments are examined over a 5-year period, may replace the special surveys

1.6.4 explains all types of survey a ship is subjected to, including but limiting to: Initial Survey, Renewal Survey, Periodical Survey, Intermediate Survey, Annual Survey, Inspection of the outside of the ships bottom, Additional Survey

1.6.5 Explains the harmonized system of ship survey and certification

1.6.6 Explains Condition Assessment Scheme (CAS) for oil tankers and Condition Assessment Programme (CAP)

1.6.7 lists the items inspected at annual survey as:

- protection of openings: hatches, ventilators, cargo doors, side scuttles, overside discharges and any other openings through which water might enter

- guardrails
- water-clearing arrangements, freeing ports, scuppers
- means of access to crews quarters and working areas

1.6.8 states that the inspections listed above are also required for the annual inspection under the International Convention on Load Lines

1.6.9 lists the items to examine in dry-dock as:

- shell plating
- cathodic protection fittings
- rudder
- stem frame
- propeller
- anchors and chain cable

1.6.10 describes the examinations to be made of the items listed above

1.6.11 describes the cleaning, preparation and painting of the hull in dry-dock

1.6.12 calculates paint quantities, given the formula for wetted surface area as:

$$S = 2.58 \sqrt{\Delta} L$$

where S = surface area in m2
Δ = displacement in tones
L = length of ship in meters

F3 Module 2

Competence: Monitor and control compliance with legislative measures to ensure safety of life at sea and protection of the marine environment

1. Responsibilities under other international maritime law embodied in international agreements and conventions that impact on the role of management level deck officers

1.1. Collision

1.1.1. International Convention for the Unification of Certain Rules of Law with Respect to Collision Between Vessels (Collision, 1910)

1.1.2. states that when collision is accidental, is caused by ‗force majeure' or if the cause is left in doubt, the damages are borne by those who have suffered them

1.1.3. states that if collision is caused by the fault of one of the vessels, liability to make good the damage attaches to the one which committed the fault

1.1.4. explains the apportionment of liability when two or more vessels are in fault

1.1.5. explains that liability attaches where the collision is caused by the fault of a pilot even when the pilot is carried by compulsion of law

1.1.6. describes the duties of the master after a collision

1.1.7. explains that the Convention extends to the making good of damages which a vessel has caused to another vessel or to goods or persons on board either vessel, either by the execution or non-execution of a maneuver or by the nonobservance of regulations, even if no collision has actually taken place

1.1.8. states that in the event of a collision or any other incident of navigation concerning a sea-going ship and involving the penal or disciplinary responsibility of the master or any other person in the service of the ship, criminal or disciplinary proceedings may be instituted only before the judicial or administrative authorities of the State of which the ship was flying the flag at the time of the collision or other incident of navigation

1.1.9. states that no arrest or detention of the vessel should be ordered, even as a measure of investigation, by any authorities other than those whose flag the ship is flying

1.1.10. states that nothing in the present Convention is to prevent any State from permitting its own authorities, in case of collision or other incidents of navigation, to take any action in respect of certificates of competence or licenses issued by that State or to prosecute its own nationals for offences committed while on board a ship flying the flat of another State

1.1.11. states that the Convention does not apply to collisions or other incidents of navigation occurring within the limits of a port or in inland waters and that the High Contracting Parties are at liberty to reserve to themselves the right to take proceedings in respect of offences committed within their own territorial waters

1.2. Assistance and Salvage

1.2.1. International Convention on Salvage, 1989 (The London Salvage Convention)

- defines “salvage operation”, “vessel” and “property”
- describes the “no cure - no pay” principle
- describes the application of the Convention
- describes the duties of the salvor, of the owner and of the master
- describes the rights of salvors
- states the criteria for assessing a reward as:
  - salved value of property (ship, cargo and bunkers)
  - skill and efforts of salvor
  - measure of success
  - nature and degree of danger
  - expenses of salvor
  - equipment used
  - vessel‘s equipment used
  - time taken to complete the salvage operation
  - preventing or minimizing the damage to environment
- states the criteria for assessing Special Compensation
- explains that the apportionment of the remuneration amongst the owners, master and other persons in the service of each salving vessel is to be determined by the law of the vessel‘s flag

- explains that every agreement as to assistance or salvage entered into at the moment and under the influence of danger may, at the request of either party, be annulled, or modified by the court, if it considers that the conditions agreed upon are not equitable
- describes the reasons for the court to set aside the agreed remuneration in whole or in part (salvor‘s fault, neglect, fraud or dishonesty)
- states that no remuneration is due from persons whose lives are saved except as provided in national law
- describes the rights of salvors of human life who have taken part in the salvage operations
- states that every master is bound, so far as he can do so without serious danger to his vessel, her crew and her passengers, to render assistance to everybody, even though an enemy, found at sea in danger of being lost
- explains that the convention also applies to assistance or salvage services rendered by or to a ship of war or any other ship owned, operated or chartered by a State or Public Authority
- explains the provision of security by the owner and the application of the salvor‘s maritime lien

1.2.2. Lloyd’s Standard Form of Salvage Agreement (LOF, 2000) (1 hour)

- states that LOF 2000 should be used where the ship or marine environment are at risk and the master has insufficient time to request the owner to arrange salvage services on a the basis of a pre-agreed rate or sum
- describes the Contractor‘s agreed endeavors to salve the ship and/or cargo, bunkers and stores and while performing the salvage services to prevent or minimize damage to the environment
- explains that the LOF 2000 form does not need to be on board; the masters of the vessels involved simply need to expressly agree to its terms before the salvage services commence
- describes the exception to the ‗no cure — no pay‘ principle
- explains that LOF 2000 superseded LOF 95 and where a salvor offers services on LOF 95 or some other terms, the master of the vessel in difficulties should attempt to get agreement to LOF 2000 terms

- explains that LOF 2000 is regarded by the International Salvage Union as a major advance, with clear, user-friendly language and many innovations
- states that LOF 2000 is a single sheet (2-page) document (whereas LOF 95 consists of 6 pages) in a simplified format
- states that the Contractor‘s remuneration is to be fixed by arbitration in London and any differences arising out of the Agreement are to be dealt with in the same way
- states that the provisions of the Agreement apply to salvage services, or any part of such services, referred to in the Agreement which have been already rendered by the Contractor at the date of the Agreement
- states that English Law is the governing law of the Agreement and of arbitration under it
- describes the obligation of the owners, their servants and agents to co-operate with the salvors
- describes the Contractor‘s duty immediately after the termination of the services to notify the Council of Lloyd‘s and where practicable the owners of the amount for which he requires security
- explains that the owners of the vessel, their servants and their agents should use their best endeavors to ensure that cargo owners provide their proportion of security before the cargo is released
- explains that, pending the completion of the security, the Contractor has a maritime lien on the property salved for his remuneration
- briefly describes how claims for arbitration are decided
- states that the master or other person signing LOF on behalf of the property to be salved enters into the agreement as agent for the vessel her cargo, freight, bunkers, stores and any other property thereon and the respective owners thereof and binds each to the due performance thereof
- states that when there is no longer any reasonable prospect of a useful result leading to a salvage reward in accordance with Convention Article 13 the owners of the vessel shall be entitled to terminate the services of the Contractor by giving notice to the Contractor in writing
- describes the provisions for special compensation set out in Convention Article

- explains that Personnel effects of Master, crew and passengers including any car accompanying a passenger are excluded from reward for salvage as per the LOF 2000
- states that the currency of award as per the LOF 2000 is USA $
- explains that as compared to the old LOF 1995, the duty to co-operate as per the new LOF 2000 is extended to provide information about nature of cargo, plans, stability data etc.
- states that as per LOF 2000, the salvors have right to terminate when “no longer any reasonable prospects of useful result”
- states that in the LOF 2000, SCOPIC clause is introduced as an alternative to Art 14 set out in the convention
- states that as per LOF 2000, the Master is authorized to sign on behalf of cargo interests
- explains that LOF 2000 defines the conditions under which a casualty is in a safe condition for redelivery to the owner which can be of crucial importance in the closing stages of a salvage operation

1.2.3. Special Compensation P and I Club (SCOPIC)Clause

- explains that SCOPIC clause is supplementary to any Lloyd‘s Form Salvage Agreement “No Cure - No Pay” (“Main Agreement”) which incorporates the provisions of Article 14 of the International Convention on Salvage 1989 (“Article 14”)
- explains that the Contractor have the option to invoke by written notice to the owners of the vessel the SCOPIC clause at any time of his choosing regardless of the circumstances and, in particular, regardless of whether or not there is a “threat of damage to the environment”
- explains that SCOPIC Clause determines the method of assessing special compensation where payable under Article 14(1) to 14(4) of the Convention
- explains that special compensation assessed in accordance with the SCOPIC Clause is called “SCOPIC remuneration”
- explains that the SCOPIC remuneration is payable only by the owners of the vessel (and not by the cargo owners) and is only payable to the extent that it exceeds the total Article 13 award (the salvage award) or, if none, any potential Article 13 award

- explains that where the owner of the vessel is a member of a P&I club the club is normally required to pay the special compensation hence interest and involvement of the P&I clubs in drafting the SCOPIC Clause
- explains that the assessment of SCOPIC remuneration commences from the time the written notice is given to the owners of the vessel and services rendered before the said written notice will not be remunerated under this SCOPIC clause at all but in accordance with Convention Article 13 as incorporated into the Main Agreement ("Article 13")
- explains that the owners of the vessel have to provide the Contractor within 2 working days (excluding Saturdays and Sundays and holidays usually observed at Lloyd's) after receiving written notice from the contractor invoking the SCOPIC clause, a bank guarantee or P&I Club letter (called "the Initial Security") in a form reasonably satisfactory to the Contractor providing security for his claim for SCOPIC remuneration in the sum of US$3 million, inclusive of interest and costs
- explains that the rates are based on time and materials plus an uplift of 25% in all cases
- explains that in the absence of agreement, any dispute concerning the proposed Guarantor, the form of the security or the amount of any reduction or increase in the security in place shall be resolved by the Arbitrator
- explains that if the owners of the vessel do not provide the Initial Security within the said 2 working days, the Contractor
- at his option, and on giving notice to the owners of the vessel, shall be entitled to withdraw from all the provisions of the SCOPIC clause and revert to his rights under the Main Agreement including Article 14 which shall apply as if the SCOPIC clause had not existed
- explains that the Owner and Contractor both have option to terminate SCOPIC under certain agreed circumstances
- explains that even when the SCOPIC clause is invoked, the duties and liabilities of the Contractor remains the same as under the Main Agreement, namely to use his best endeavors to salve the vessel and property thereon and in so doing to prevent or minimize damage to the environment

- explains that the assessment of SCOPIC remuneration includes the prevention of pollution as well as the removal of pollution in the immediate vicinity of the vessel insofar as this is necessary for the proper execution of the salvage
- explains that the owner has the right to send on-board a casualty Representative (SCR)
- explains that Underwriters have the right to send one special hull representative and one special cargo representative collectively called the "Special Representatives")
- explains that the salvage masters are required to send daily reports to Lloyds and the owner until SCR arrives and thereafter to SCR
- explains that the SCOPIC remuneration is not a General Average expense to the extent that it exceeds the Article 13 Award; any liability to pay such SCOPIC remuneration is that of the Shipowner alone and no claim whether direct, indirect, by way of indemnity or recourse or otherwise relating to SCOPIC remuneration in excess of the Article 13 Award is to be made in General Average or under the vessel's Hull and Machinery Policy by the owners of the vessel
- explains that any dispute arising out of this SCOPIC clause or the operations is to be referred to Arbitration as provided for under the Main Agreement
- explains that a non binding code of practice has been agreed between the International Salvage Union (ISU) and the International Group of Clubs

1.3. Cargo

1.3.1. International Convention for the Unification of Certain Rules of Law Relating to Bills of Loading, as Amended by the Protocol of 1968 (Hague-Visby Rules)

- defines:
  - carrier
  - contract of carriage
  - goods
  - ship
  - carriage of goods
- lists the duties of the carrier to make the ship seaworthy and fit for the carriage of cargo

- describes the carrier‘s duty to care for the cargo
- describes the duty of the carder, master or agent of the carrier to issue a bill of lading
- lists the information which should be shown in a bill of lading
- explains that a bill of lading is prima facie evidence of the receipt by the carrier of the goods as described in it and proof to the contrary is not admissible when the bill of lading has been transferred to a third party acting in good faith
- explains that the shipper is deemed to have guaranteed the accuracy of marks, number, quantity and weight as furnished by him, and that the shipper is to indemnify the carrier against loss arising from inaccuracies in such particulars
- explains the duty of the carrier, master or agent to issue a “shipped” bill of lading after the goods are loaded, provided the shipper surrenders any previously taken up document of title
- explains the mandatory domain of the Hague-Visby rules
- explains the carrier‘s liability for loss or damage arising or resulting from unseaworthiness
- states that whenever loss of damage has resulted from unseaworthiness, the burden of proving due diligence is on the carrier
- lists the exceptions to the carriers responsibility for loss or damage
- explains the shippers responsibility for loss or damage sustained by the carrier or ship
- states the right to deviate for the purpose of saving life or property
- explains the limitation of liability for loss or damage and the circumstances in which benefit of limitation is lost
- describes the provisions regarding goods of an inflammable, explosive or dangerous nature
- explains the liability of the carrier‘s servants (Himalaya clause) explains that this Convention does not apply to charter-parties, but, if bills of lading are issued under a charter party, they must comply with the terms of this Convention
- states that any lawful provisions regarding general average may be inserted in a bill of lading

- explains that, in certain circumstances, goods may be carried under an agreement between the carrier and shipper in any contractual terms not contrary to public policy, provided that no bill of lading is issued and that the terms agreed are embodies in a non-negotiable receipt, marked as such
- explains that the Rules do not prevent a carrier or shipper entering into any agreement regarding loss of damage to goods prior to the loading on, and subsequent to, the discharge from the ship on which the goods are carried by sea
- states that the Convention does not affect the rights and obligations of the carrier under any statute relating to the limitation of the liability of owners of sea-going ships
- describes the scope of application of the provisions of this Convention
- describes briefly the system of documentary credit in the sale of goods during shipment

1.3.2. Casualty Investigation Code

- explains the general procedures for the conduct of casualty investigations under the IMO Casualty Investigation Code

1.3.3. Charter Parties

- states that a charter-party is a contract between the shipowner and the charterer for the use of a ship or her cargo space
- explains that a voyage charter-party is a contract to carry a specified, normally full, cargo between named ports at an agreed freight rate explains that the shipowner remains responsible for the operation of the ship and the costs involved, but the charterer sometimes pays the stevedoring charges
- states that contracts are normally drawn up using standard charter-party forms amended as required by alterations and additional clauses
- describes the tendering of notice of readiness at the loading port
- explains that if the ship is not ready to receive cargo, whether alongside or not, by the cancellation date the charterer may cancel the charter

- explains what is meant by laytime and the terms “running days/hours”, “Sundays and holidays excepted” and “weather working days”

- states that the laytime for loading and discharging may be stated separately or as a total

- states that all times relevant to cargo working should be recorded in the logbook and time sheets for the calculations of laytime completed as a check on the charterer‘s laytime statement

- states that all times relevant to cargo working should be recorded in the logbook and time sheets for the calculations of laytime completed as a check on the charterer‘s laytime statement

- explains that time lost due to defects of the ship or its equipment is not counted in the laytime

- explains that in the event of cargo work being completed before the expiration of laytime, dispatch is usually payable by the shipowner to the charterer

- states that bills of lading are normally issued under a voyage charter-party and signed by the master or on his behalf

- explains that the bills of lading may incorporate the terms of the charter-party which, in any case, takes precedence over the bills of lading as between shipowner and charterer

- explains that when bills of lading have been transferred to a third party they constitute the contract between the shipowner and that party

- states that a voyage charter may be arranged to cover a stated number of successive voyages or an unspecified number of voyages to be performed in a given time

- states that in a time charter-party the charterer agrees to hire the ship for a specified period of time

- explains that the charterer may use the vessel for any voyage he wants within the trading area agreed in the charter-party

- explains that the charterer pays for bunkers and for cargo loading and discharging, port dues, canal dues and pilotage

- states that owners pay crew costs and for provisions, necessary stores, insurance of the ship and the costs of maintaining the ship in class and keeping it in an efficient condition to carry out the charterer‘s wishes
- states that the charter-party contains a description of the ship, including its speed and fuel consumption
- explains that inability to maintain the warranted speed or consumption as a result of heavy weather or other cause should be substantiated by entries in the log-book
- states that crew overtime in connection with the cargo is usually for the account of the charterer, and separate time sheets should be kept
- explains that the off-hire clause states the circumstances in which payment of hire ceases during time lost to the charterer
- explains that off-hire deductions may be made for time lost due to reduced- speed resulting from defects of ship or machinery, for the cost of additional fuel and for extra expenses
- states that the master is usually required to sign bills of lading as presented to him by the charterer or the charter-party may give the charterer the right to sign them on his behalf
- states that a time charter-party may be used for a single round voyage
- describes the master‘s actions regarding damage done by stevedores to the ship or cargo
- explains that demise or bareboat charter-party is a leasing arrangement in which the charterer operates the ship as if it were his own
- states that the master and crew are employed by the charterer, to whom they are responsible as if he were the owner
- explains that a tonnage contract or contract of affreightment may be used where a shipper needs to transport large quantities over a long period
- explains that the contract does not name particular ships and the shipowner is free to use any suitable ship, his own or chartered, for each shipment
- states that the loading dates are specified and that punctual performance is essential
- states that each individual shipment is normally subject to the terms of a conventional voyage charter-party

1.3.4. Hamburg Rules' Maritime Legislation

- explains the effect of charges where goods are carried under Hamburg Rules
- explains carrier's extended liability for loss or damage to the goods
- explains reductions to exception to liability, inward and outward bills of lading, live animals and deck cargo
- explains the need to inform P & I Club where goods are carried under Hamburg Rules

1.4. General Average and Marine Insurance

1.4.1. The York-Antwerp Rules, 1974

- states that where the York-Antwerp Rules apply, general average should be adjusted according to the Rules to the exclusion of any law or practice inconsistent with them
- defines a general average act
- states that general average sacrifices and expenses are to be borne by the different contributing interests on the basis of these Rules
- explains that only such losses, damages or expenses which are the direct consequence of the general average act are allowed as general average and that no indirect loss whatsoever will be admitted
- explains that rights to contribution in general average when the event which gave rise to the sacrifice was due to the fault of one of the parties to the adventure
- states that the onus of proof is upon the party claiming in general average to show that the loss or expense claimed is properly allowable as general average
- states that any extra expense incurred in place of another expense which would have been allowable as general average is deemed to be general average, but only up to the amount of the general average expense avoided
- explains that general average is to be adjusted, as regards both loss and contribution, on the basis of values at the time and place when and where the adventure ends
- states that the general principles contained in Rules A to G are amplified by numbered rules I to XXII, dealing with specific points of practice

- states that the master should make a declaration of general average, as is required by the law and custom of the port, at a port of refuge and at a discharging port when general average damage to the cargo is suspected
- explains the duty of the master to see to it that general average contributions (average bonds) are collected for the benefit of those entitled to them, whether they are cargo owners or shipowners, exercising the ship owner's lien on the cargo, where necessary, until they are paid

1.5. Stowaways

1.5.1. explains that as per IMO Guidelines - a "stowaway" is defined as "a person who is secreted on a ship, or in a cargo which is subsequently loaded on the ship, without the consent of the shipowner or the master or any other responsible person, and who is detected on board after the ship has departed from a port and is reported as a stowaway by the master to the appropriate authorities"

1.5.2. explains that an international convention relating to stowaways was adopted in Brussels in 1957, but it has not yet entered into force

1.5.3. explains that according to the P&I clubs (who deal with many stowaway incidents), certain parts of the world are high-risk areas for stowaways

1.5.4. explains that since the P&I clubs invariably have the latest intelligence on stowaway risks, masters should endeavor to obtain their latest club bulletins and information

1.5.5. explains that at any port in a high-risk area, great care should be taken to ensure that stowaways do not board, and the following safeguards should be observed:

- A watch should be kept on the accommodation ladder or gangway
- Stevedores should only be allowed to work in restricted areas and a watch should be kept on them
- Open spaces should be closed as far as possible
- A search of the ship should be carried out before the ship sails
- All open-top containers on the quay should be checked. All containers on the quay should be stacked door-to-door, if possible

1.5.6. explains IMO has introduced various guidelines on stowaway matters, the latest being in Resolution A.871(20), adopted on 27 November 1997, and its Annex, “Guidelines on the Allocation of Responsibilities to seek the Successful Resolution of Stowaway Cases”

1.5.7. explains that the guidelines in the resolution state that the resolution of stowaway cases is difficult because of different national legislation in the various countries involved, nevertheless, some basic principles can be applied generally

1.5.8. explains that as per the IMO guideline there are nine basic principles which can be applied generally with respect to stowaway cases, the second of these is that stowaway/asylum-seekers should be treated in compliance with international protection principles as set out in international instruments (including the UN Convention relating to the Status of Refugees of 28 July 1951 and the UN Protocol relating to the Status of Refugees of 31 January 1967) and relevant national legislation, the ninth is that stowaway incidents should be dealt with humanely by all parties involved. Due consideration should always be given to the operational safety of the ship and to the well-being of the stowaway

1.5.9. explains that Paragraph 5.1 of the IMO Guidelines lists responsibilities of the master in stowaway cases, which are as follows:

- to make every effort to determine immediately the port of embarkation of the stowaway;
- to make every effort to establish the identity, including the nationality/citizenship of the stowaway;
- to prepare a statement containing all information relevant to the stowaway, in accordance with information specified in the standard document annexed to these Guidelines, for presentation to the appropriate authorities;
- to notify the existence of a stowaway and any relevant details to his shipowner and appropriate authorities at the port of embarkation, the next port of call and the flag State;
- not to depart from his planned voyage to seek the disembarkation of a stowaway to any country unless repatriation has been arranged with sufficient documentation and permission for disembarkation, or unless there are extenuating security or compassionate reasons;

- to ensure that the stowaway is presented to appropriate authorities at the next port of call in accordance with their requirements;
- to take appropriate measures to ensure the security, general health, welfare and safety of the stowaway until disembarkation.

1.5.10. explains the procedure to be adopted, in general, on the discovery at sea of stowaways, which is;

- The owner or manager, as appropriate, should be contacted. The owner will normally contact the P&I club‘s managers to decide on a course of action. The P&I club‘s correspondent serving the next port of call will normally be contacted by the club managers. The correspondent should be able to advise what information will be required by port State and other officials.
- An entry should be made in the Official Log Book recording the discovery of the stowaways.
- The compartment or area in which the stowaways were found should be searched. Any documents or articles of clothing, etc. may give an indication of their place of origin. (Most countries only allow a stowaway to be landed if he has the necessary travel documents to return to his own country. Stowaways rarely have any documentation, however, and some will try to destroy all clues as to their identity.)
- The clothing of the stowaways should be searched for indications as to their origin.
- The agent at the next port of call should be contacted and instructed to advise the appropriate authorities of the port State of the presence of stowaways on board.
- Each stowaway found should be individually interviewed in order to establish the following details:
    - name of stowaway;
    - stowaway‘s date and place of birth; nationality of stowaway;
    - name, date and place of birth of either or both of the stowaway‘s parents;
    - postal and residential address of the stowaway and either parent;
    - stowaway‘s passport or seaman‘s book number, together with date and place of issue; and
    - stowaway‘s next of kin, if different from above.

- Stowaway details should be obtained the completed details should be communicated to the agent and the P&I club correspondent at the next port of call.
- Photographs of each stowaway should be taken and, where digital camera facilities are available, transmitted to the P&I club correspondent; these may enable travel documents to be obtained more quickly on the ship‘s arrival.
- All stowaways should be housed in some part of the crew accommodation which can be locked when necessary.
- The stowaways should not be locked in their accommodation when the vessel is at sea and well clear of land unless they are considered a threat to the safety of the ship or personnel on board. Consideration should be given, however, to the possibility of unguarded stowaways launching a liferaft or boat in an attempt to reach land.
- The stowaways should be locked securely in their accommodation when the vessel approaches any port or nears any land. (Consideration should be given to the possibility of the stowaways‘escape through open scuttles.)
- The stowaways should be provided with adequate food, water, sanitary facilities, etc.
- The stowaways should be treated in a humane manner.
- The stowaways should not be made to work for their keep.
- The stowaways should not be signed on the Crew Agreement and should not be entered on any List of Crew. A “Stowaway List” should be made recording any known particulars, ready for production to port officials.
- Evidence of costs relating to the stowaway case, such as fuel, insurance, wages, stores, provisions and port charges, should be gathered to support the owner‘s claim on his P&I policy. (The owner‘s costs associated with the landing of stowaways are usually recoverable from his P&I club.)
- Full details of all events and particulars relating to the stowaway incident should be recorded in the Official Log Book, if necessary in an annexed document. (This may be used as part of any report required by owners, the club, etc.)

1.5.11. explains that arriving with stowaways on board can have complications

1.5.12. explains that the IMO Guidelines on the Allocation of Responsibilities to seek the Successful Resolution of Stowaway Cases state (in paragraph 3) that the resolution of stowaway cases is difficult because of different national legislation in each of the potentially several countries involved: the country of embarkation, the country of disembarkation, the flag State of the vessel, the country of apparent, claimed or actual nationality/citizenship of the stowaway, and countries of transit during repatriation

1.5.13. explains that the IMO Guidelines on the Allocation of Responsibilities to seek the Successful Resolution of Stowaway Cases contain (in paragraph 4) certain basic principles which can be applied generally, the first of these is that there is recognition that stowaways arriving at or entering a country without the required documents are, in general, illegal entrants. Decisions on dealing with such situations are the prerogative of the countries where such arrival or entry occurs, the third is that the shipowner and his representatives on the spot, the master, as well as the port authorities and national Administrations, should co-operate as far as possible in dealing with stowaway cases

1.5.14. states that in every case the agent should be notified of the presence of stowaways in advance of arrival

1.5.15. explains that under the U.S. Refugee Act 1980 a stowaway who arrives in the USA can request political asylum

1.5.16. explains that the Immigration and Naturalization Service (INS) has taken the position that shipowners are required to provide 24-hour armed guards during the entire asylum process which can take months

1.5.17. explains that there have been cases where the owner has incurred costs in excess of $1m for such detention

1.5.18. explains that many countries impose very heavy penalties (in some cases of over US$200,000) on masters who fail to ensure that stowaways are kept securely on board in port

1.6. Ship’s Agents and Agency

1.6.1. explains that as per United Nations Conference on Trade and Development, UNCTAD MINIMUM STANDARDS FOR SHIPPING AGENTS, " Shipping agent" means any person (natural or legal) engaged on behalf of the owner, charterer or operator of a ship, or of the owner of cargo, in providing shipping services including;

- Negotiating and accomplishing the sale or purchase of a ship;
- Negotiating and supervising the charter of a ship;
- Collection of freight and/or charter hire where appropriate and all related financial matters;
- Arrangements for Customs and cargo documentation and forwarding of cargo;
- Arrangements for procuring, processing the documentation and performing all activities required related to dispatch of cargo;
- Organizing arrival or departure arrangements for the ship;
- Arranging for the supply of services to a ship while in port

1.6.2. explains the authority of the agency and where it may be actual authority or apparent authority (also called ostensible authority)

1.6.3. explains that actual authority may be express or implied

1.6.4. states that express authority is given by words (spoken or written) such as when an officer is appointed by letter to command of a ship and authority is implied when it is inferred by the conduct of the parties and the circumstances of the case, such as when a shipmaster is appointed to command by a shipowner, who thereby impliedly authorizes him to carry out, on the owner‘s behalf, all the usual things that fall within the scope of a master‘s position, e.g. engagement and discharge of crew, signing of bills of lading, and purchasing of provisions

1.6.5. explains that an exception to this would be where the principal has expressly placed a restriction on the implied authority of the agent, e.g. where the master is expressly prohibited from signing bills of lading

1.6.6. describes the different types of agent and agency

1.6.7. explains that agents are normally either general agents or special agents

1.6.8. explains that a general agent is an agent who has authority to act for his principal in all matters concerning a particular trade or business, or of a particular nature, many liner agents, for example, act as general agent in a particular city or country for one or more carriers

1.6.9. explains that a special agent is an agent appointed for the carrying out of particular duties which are not part of his normal business activities

1.6.10. explains that a special agent‘s authority is therefore limited by his actual instructions, most port agents are special agents since their authority does not extend beyond their actual instructions

1.6.11. states that shipmasters are similarly special agents for purposes of engaging and discharging crew, purchasing ships‘ stores and bunkers, and making salvage agreements in certain cases

1.6.12. outlines that an agent‘s duties to his principal are:

- to perform his duties in person, using ordinary skill and diligence, and if he purports to have special skills, to use his special skills also;
- to obey lawful instructions of his principal, and when he is not instructed on a particular matter, to act in his principal‘s best interests;
- to disclose all information relevant to the agency to the principal, avoiding any conflict of interest;
- to maintain confidentiality about matters communicated to him as agent, and not to disclose them to prospective third parties;
- to keep proper accounts of all transactions and render them to his principal on request;
- not to make extra profits from the agency without disclosing them to his principal

1.6.13. explains that under the terms of voyage charters port agents are normally appointed, and therefore paid for, by the shipowner. However, many voyage charterers insist on nominating port agents, and are entitled to do so if the charter party is suitably claused to that effect

1.6.14. explains where a charter party provides that “the vessel shall be consigned to Charterers’ agents….”, it means that the charterer will nominate agents

1.6.15. explains that when on a time charter, most of the —voyage costs‖ associated with earning the freight or other revenue are normally for the time charterer‘s account, and it can be expected that port agents will be appointed by the charterer in order to look after his commercial interests

1.6.16. explains that the charterer‘s obligation to provide and pay for agents may be in a “Charterers to provide” clause, or a separate Agency Clause or Consignment Clause

1.6.17. explains that any “protecting” or “husbandry agent” used will be nominated and appointed by the shipowner

1.6.18. explains that the shipping agents have to adhere to a Code of professional conduct given in United Nations Conference on Trade and Development, UNCTAD Minimum Standards For Shipping Agents, which states that the shipping agent shall:

- discharge his duties to his principal(s) with honesty, integrity and impartiality;
- apply a standard of competence in order to perform in a conscientious, diligent and efficient manner all services undertaken as shipping agent;
- observe all national laws and other regulations relevant to the duties he undertakes;
- exercise due diligence to guard against fraudulent practices;
- exercise due care when handling monies on behalf of his principal(s)

1.7. Port of refuge procedures

1.7.1. states that a “port of refuge” is a port or place that a vessel diverts to when her master considers it unsafe to continue the voyage due to a peril that threatens the “common safety”, e.g. when there is a dangerous ingress of water into the vessel, a dangerous shift of cargo, the vessel adopts an angle of loll, there is a serious fire on board, etc.

1.7.2. explains that where such a deviation is for the preservation from peril of property involved in a common maritime adventure, it will usually constitute a general average act and the costs of the deviation to and stay at the port of refuge will be allowed in general average

1.7.3. explains that where the shipowner or carrier is a party to a contract of carriage, discontinuation of the voyage is a deviation from the contract

1.7.4. explains that a deviation to a port of refuge will be regarded as a justifiable deviation if the reason can be shown to be a valid one within the terms of the contract. All contractual rights would, in that case, be unaffected

1.7.5. explains that if the reason for deviating could not be shown to be valid, the deviation would be considered unjustifiable and the consequences could be severe for the shipowner or carrier, in that it would probably constitute a repudiatory breach of the contract, making the owner/carrier liable for all costs of any accident to ship or cargo sustained during the deviation

1.7.6. outlines that Valid reasons for deviating to a port of refuge usually include:

- weather, collision or grounding damage affecting seaworthiness of the ship;
- serious fire;
- dangerous shift of cargo;
- serious machinery breakdown;
- any other accident causing some serious threat to the vessel and cargo;
- shortage of bunkers (if it can be proved that the vessel left port with adequate bunkers for the foreseeable voyage, and ran short as a consequence of weathering exceptionally severe weather, contamination, etc.)

1.7.7. explains that a —Port of refuge‖ is a term usually associated with a general average act since, under the York-Antwerp Rules, certain costs and expenses incurred in making for, entering, staying at and leaving a port or place of refuge, even where the ship returns to her port or place of loading, are admitted as general average

1.7.8. describes the explanation given in Rule X for expenses at port of refuge provided in the York-Antwerp Rules

1.7.9. explains that a port or place where a vessel seeks temporary shelter from adverse weather is not a port of refuge, since running for shelter is “ordinary” practice and not “extraordinary” in the context of Rule A of the York-Antwerp Rules

1.7.10. explains that a “common maritime adventure” is said to be terminated on completion of discharge of cargo (or disembarkation of passengers) at the port of destination following a general average act. If the voyage is abandoned at an intermediate port (e.g. a port of refuge), then the adventure terminates at that port

1.7.11. explains that a declaration of general average should be formally made in compliance with local law and custom before delivery of cargo at the termination of the voyage, in order to initiate an adjustment

1.7.12. explains that the declaration is usually made by the shipowner or the master, but in some countries any one of the interested parties may make it. The owners or agent should be able to advise on local requirements

1.7.13. explain the procedure for any particular port or place of refuge in general, the following basic steps should be followed:

- as soon as the decision is taken to discontinue the voyage and make for a port or place of refuge, (whether under tow or otherwise) inform the owner and charterer (if any), stating the reason for the deviation
- record the ship‘s position. Sound tanks for quantity of bunkers on board. From this point until departure from the port or place of refuge, keep accurate records of events and expenditure, etc., for eventual delivery to the owner and average adjuster
- request the owner to arrange the appointment of an agent at the port of refuge to handle the vessel‘s visit
- if the cause of the deviation is an —accidentll inform the flag state
- call the agent as soon as his identity is known. Pass ETA and information necessary for making preparations for the vessel‘s arrival, including tonnage, length, flag, P&I club, classification society, etc. Request the agent to notify:
    - Port State Administration if vessel is damaged or seaworthiness is affected;
    - harbor master or port authority. Inform port authority of the full facts, as the authority may want to keep vessel outside port until cargo discharged, etc. Give details of the nature and severity of damage, mentioning any disabled navaids, steering gear, machinery, etc. State any pollution hazard.
    - pilot station, linesmen, boatman, customs, port health, immigration, etc.
    - local correspondent of the owner‘s P&I club. (See club handbook for name and address, or ask owners.) A representative from the correspondent firm, or a surveyor appointed by the correspondent, should attend on arrival.
- On arrival at the port or place of refuge, the salvor (if any) will require salvage security, which should be arranged by the owner and cargo owners. Failing this, the salvor may have vessel arrested pending satisfaction of his claim.
- obtain health clearance in accordance with local regulations (as advised by the agent).
- enter vessel in with customs “under average”.

- inform the owner (and charterer, if any) of vessel‘s safe arrival.
- owners will declare general average. (Any of the parties involved may declare general average, but the owners will normally do this since they are closest to “the action”.)
- note protest as soon as possible but in any case within 24 hours, in compliance with local custom (ask the agent about this), reserving the right “to extend at a time and place convenient”.
- Where there is hull or machinery damage, the agent should be requested to notify local Lloyd‘s Agent (a requirement of the Notice of Claim and Tenders Clause in Institute Time Clauses - Hulls 1.10.83).
- Hull and machinery underwriters normally instruct a surveyor, in major cases from the Salvage Association
- Where there is hull or machinery damage, a class surveyor, if available at the port, will inspect and report on the damage, stipulating repairs necessary for the vessel to maintain class. Temporary repairs may be acceptable.
- if no class surveyor is available, the class society should be contacted, and will advise the appropriate steps to take in order for class to be maintained until a port can be reached for survey, the old practice of requesting two independent masters or engineers to inspect temporary repairs and issue a Certificate of Seaworthiness should no longer be necessary. Even where a class surveyor cannot reach a damaged ship, the classification society can usually be notified of the damage and asked for instructions.
- if cargo damage is probable, or cargo discharge is necessary before repairs can be made, call a hatch survey before commencing discharge. Employ only registered and unbiased surveyors recommended by the P&I club correspondent. Cargo interests should be notified so that they can appoint their own surveyors. Remember that cargo surveyors are appointed by cargo interests and may criticize the master‘s actions or allege that the vessel was unseaworthy. Be guided by the P&I club correspondent as to who to allow on board and about making statements which may adversely affect the owner‘s legal position.
- if the voyage is being terminated and cargo owners are taking delivery of their consignments, General Average Bond and General Average Guarantee forms will first have to be signed. The owner‘s lien on cargo should be exercised if necessary; this should be discussed with the owner and agent.

- arrange cargo discharge (under survey) and either trans-shipment or warehousing of cargo during the repairs, if necessary. (This will depend on the length of time in port, nature of cargo, etc.)
- on receipt of class surveyor‘s report re- hull/machinery damage, the owner will advertise for
- tenders.(Superintendents and the Salvage Association surveyor will jointly attend to this, bearing in mind the Notice of Claim and Tenders Clause and underwriters‘ power of veto. Tenders should only be accepted with guidance from Salvage Association surveyor and Lloyd‘s or IUA Agent.)
- carry out repairs under class and Salvage Association surveyors‘guidance.
- On completion of repairs, class surveyor will carry out another survey. If, in his opinion, the vessel is seaworthy he will issue an Interim Certificate of Class, and will send his report to the classification society. If acceptable to the society‘s committee, the vessel will retain class. If the class surveyor is employed by an authorized society, he may also issue provisional statutory certificates on behalf of MCA (or other flag State Administration) to enable the vessel to continue her voyage.
- reload cargo (under survey) if voyage being continued.
- Extend Protest to include all details of the damage and repairs. Obtain copies for owners.
- port agent will pay repairers. (If unpaid, repairers will have a maritime lien on the vessel.) Allow general average and Salvage Association surveyors (representing H&M insurers) to see the agent‘s account before paying.
- send all relevant documents to the owner for onwards delivery to the average adjuster.
- Enter vessel outwards with Customs (in accordance with local regulations, as advised by the agent). Obtain outwards clearance.
- continue the voyage.

1.7.14. explains that in most general average cases the main evidence required for the adjustment comes from the various survey reports, supported by statements by witnesses and ship‘s records

1.7.15. outlines the evidence required at port of refuge as listed below:

- full and accurate records should be kept of the general average incident and the call at the port of refuge, including details of all the various parties involved and their actions
- photographs and video footage may be useful; the general average statement may take more than a year to produce
- where salvage services are engaged, a full record should be kept of the salvor‘s actions and of the equipment used by both parties
- in order to assess the various contributory values, the average adjuster will require the following documents:
    - all general average security documents including signed average bonds, average guarantees, counterfoils of average deposit receipts and cancelled deposit receipts;
    - casualty reports from the master;
    - certified extracts from deck and engine room logs;
    - copies of extended protests;
    - survey reports on hull and machinery damage;
    - survey reports on cargo lost or damaged by general average sacrifice;
    - account sales of any cargo sold;
    - copies of any shipping invoices;
    - copies of telexes;
    - accounts for disbursements incurred together with all supporting vouchers;
    - cargo valuation forms;
    - manifest of cargo onboard at time of the general average act;
    - copies of bills of lading;
    - portage account for the voyage, and an account of stores consumed;
    - any other evidence relating to the casualty.

1.8. The master/pilot relationship

1.8.1. explains that the —maritime pilot‖ referred to in this section does not include deep-sea pilots or shipmasters or crew who are certificated or licensed to carry out pilotage duties in particular areas

1.8.2. reviews the applicable contents of IMO Assembly Resolution A.960(23), *"Recommendations on Training and Certification and Operational Procedures for Maritime Pilots Other Than Deep-Sea Pilots"*

1.8.3. explains that the law in most countries makes clear that while a maritime pilot is engaged in pilotage duties aboard a vessel in compulsory pilotage waters the pilot has conduct of the vessel and directs the navigation of the vessel, subject to the master's overall command of the ship and the ultimate responsibility for its safety. In this respect, the navigation of a ship in compulsory pilotage waters is a shared responsibility between the pilot and the master/bridge team

1.8.4. explains that maritime pilots are expected to act in the public interest and to maintain a professional judgement that is independent of any economic pressures to the ship or other desires that do not comport with the needs of maritime safety. Because of these duties, a maritime pilot is not considered a member of the bridge —team‖, but a maritime pilot is expected to develop and maintain a cooperative, mutually-supportive working relationship with the master and bridge team in recognition of the respective responsibility of each for the safe navigation of the vessel

1.8.5. explains the provisions relating to pilotage contained in STCW, Section A-VIII, Part 4-1, paragraph 49

1.8.6. explains that the master has the right, and in fact the duty, to intervene or displace the pilot in circumstances where the pilot is manifestly incompetent or incapacitated or the ship is in immediate danger *(„in extremis")* due to the pilots actions or intentions

1.8.7. explains that the master should generally:

- see that the ship's navigation is monitored (including plotting fixes/positions on charts) as if there were no pilot on board;
- ensure that officers, helmsmen, etc. attend to the pilot's requests with efficiency and courtesy;
- instruct the officer-of-the-watch that he has charge of the vessel whilst under pilotage, unless specifically informed otherwise by the master;
- clearly state his/her opinion to the pilot on important matters of navigation and maneuvering.

1.8.8. states that the shipowner is generally liable for the consequences of negligent navigation whilst the ship is under pilotage

Competence

F3 Module 3: Maintain Safety and Security of Ship's Crew and Passengers and the Operational Condition of Life-Saving, Fire-Fighting and Other Safety Systems

1. Life-saving appliance regulations (SOLAS)

1.1. demonstrate a thorough knowledge of the regulations concerning life-saving appliances and arrangements (SOLAS), including the LSA Code

1.2. Organization of Fire and Abandon Ship Drills

1.3. Maintenance of Life-saving, Fire-fighting and Other Safety Systems

2. Actions to protect and safeguard all persons on board in emergencies

2.1. states that some crew members will be assigned specific duties for mustering and control of passengers

2.2. lists those duties as:

2.2.1. warning the passengers

2.2.2. ensuring that all passenger spaces are evacuated

2.2.3. guiding passengers to muster stations

2.2.4. maintaining discipline in passageways, stairs and doorways

2.2.5. checking that passengers are suitably clothed and that Lifejackets are correctly donned

2.2.6. taking a roll-call of passengers

2.2.7. instructing passengers on procedure for boarding survival craft or jumping into the sea

2.2.8. directing passengers to embarkation stations

2.2.9. instructing passengers during drills

2.2.10. ensuring that a supply of blankets is taken to the survival craft

2.3. Rescue of Persons from a Vessel in Distress or from a Wreck

2.3.1. states why it is preferable to wait for daylight when no immediate danger exists

2.3.2. states that communications should be established between the ships and the method of rescue agreed upon when time permits

2.3.3. states that rescue boats or motor-lifeboats would be used if conditions permitted

2.3.4. states that unnecessary equipment should be removed from the boats and replaced by lifejackets, if buoys, blankets and a portable VHF radio

2.3.5. states that the rescue vessel should reconnoiter the area to see if there is any wreckage which could be a danger to boats

2.3.6. describes how both ships can spread oil in rough weather

2.3.7. describes the preparations for taking survivors on board from the boats

2.3.8. describes how to provide a lee and launch boats

2.3.9. describes how boats should approach the wreck and pick up survivors

2.3.10. describes the recovery of boats and survivors

2.3.11. describes the methods of rescue which may be used when sea conditions are too dangerous to use boats

2.4. Man-overboard Procedure

2.4.1. describes methods of recovering a person from the sea when heavy weather prevents the use of the normal man oeuvres and boats

2.4.2. describes and explains the actions to take when a person is reported missing at sea

3. Actions to limit damage and salve the ship following a fire, explosion, collision or grounding

3.1. Means of limiting damage and salving the ship following a fire or explosion

3.1.1. describes the use and limitations of standard procedures and prepared contingency plans in emergency situations

3.1.2. describes methods of fighting fires (see IMO Model Course 2.03, Advanced Training in Fire Fighting)

3.1.3. states that cooling of compartment boundaries where fire has occurred should be continued until ambient temperature is approached

3.1.4. explains the dangers of accumulated water from fire fighting and describes how to deal with it

3.1.5. states that watch for re-ignition should be maintained until the area is cold

3.1.6. describes the precautions to take before entry to a compartment where a fire has been extinguished

3.1.7. describes the inspection for damage

3.1.8. describes measures which may be taken to plug holes, shore-up damaged or stressed structure, blank broken piping, make safe damaged electrical cables and limit ingress of water through a damaged deck or superstructure

3.1.9. outlines the measures to be taken when the inert-gas main and gas lines to a mast riser are fractured

3.1.10. states that continuous watch should be kept on the damaged area and temporary repairs

3.1.11. states that course and speed should be adjusted to minimize stresses and the shipping of water

3.2. Procedure for Abandoning Ship

3.2.1. states that a ship should only be abandoned when imminent danger of sinking, breaking up, fire or explosion exists or other circumstances make remaining on board impossible

3.2.2. states that a distress call should be transmitted by all available means until acknowledged

3.2.3. lists the information to include in the distress message

3.2.4. describes other distress signals which may be used to attract attention

3.2.5. describes the launching of boats and liferafts when the ship is listing heavily

3.2.6. describes the launching of boats and liferafts in heavy weather conditions

3.2.7. describes the use of oil to calm the sea surface and explains why fuel oil is not suitable

Competence

F3 Module 4: Develop emergency and damage control plans and handle emergency situations

1. The preparation of contingency plans for response to emergencies

1.1 draws up a muster list and emergency instructions for a given crew and type of ship

1.2 assigns duties for the operation of remote controls such as:

1.2.1 main engine stop

1.2.2 ventilation stops

1.2.3 lubricating and fuel oil transfer pump stops

1.2.4 dump valves

1.2.5 CO2 discharge

1.2.6 watertight doors

1.2.7 and for the operation of essential services such as:

- emergency generator and switchboard
- emergency fire and bilge pumps

1.3 describes options for the division of the crew, e.g., into a command team, an emergency team, a back-up emergency team and an engine-room emergency team

1.4 explains the composition of the emergency teams in the above objective

1.5 states that crew members not assigned to emergency teams would prepare survival craft, render first aid, assemble passengers and generally assist the emergency parties as directed

1.6 states that crew members not assigned to emergency teams would prepare survival craft, render first aid, assemble passengers and generally assist the emergency parties as directed

1.7 designates muster positions for the command team, both at sea and in port

1.8 designates muster positions for the emergency teams

1.9 states that the engine-room emergency team would take control of engine-room emergencies and keep the command team informed

1.10 states that good communications between the command team and the emergency teams are essential

1.11 prepares contingency plans to deal with:

1.11.1 fire and/or explosion in specific areas, such as galley, accommodation, container stows on or under deck, engine-room or cargo space, including co-ordination with shore facilities in port, taking account of the ship's fire-control plan

1.11.2 rescue of victims from an enclosed space

1.11.3 water ingress into the ship

1.11.4 serious shift of cargo

1.11.5 being towed by another ship or tug

1.11.6 heavy-weather damage, with particular reference to hatches, ventilators and the security of deck cargo

1.11.7 rescue of survivors from another ship or from the sea

1.11.8 leakages and spills of dangerous cargo stranding

1.11.9 abandoning ship

1.12 explains how drills and practices should be organized

1.13 describes the role of a shipboard safety committee in contingency planning

2. Actions to be Taken when Emergencies Arise in Port

2.1 describes actions to take in the event of fire on own ship, with particular reference to co-operation and communication with shore facilities

2.2 describes action which should be taken when fire occurs on a nearby ship or an adjacent port facility

2.3 describes the circumstances in which a ship should put to sea for reasons of safety

2.4 describes the actions to be taken when own ship is dragging anchor towards dangers in port

2.5 describes the actions which can be taken to avoid a ship dragging anchor towards own ship in an anchorage

2.6 describes the actions and precautions to take when a submarine cable is lifted by the anchor

2.7 describes how to buoy and slip an anchor

2.8 describes how an anchor may be recovered when no power is available at the windlass

3. Ship construction, including damage control

3.1 Flooding of compartments

3.1.1 defines:
- margin line
- permeability of a space

3.1.2 explains what is meant by floodable length

3.1.3 explains what is meant by permissible length of compartments in passenger ships

3.1.4 describes briefly the significance of the factor of subdivision

3.1.5 states the assumed extent of damage used in assessing the stability of passenger ships in damaged condition

3.1.6 summarizes, with reference to the factor of subdivision, the extent of damage which a passenger ship should withstand

3.1.7 describes the provisions for dealing with asymmetrical flooding

3.1.8 states the final conditions of the ship after assumed damage and, where applicable, equalization of flooding

3.1.9 states that the master is supplied with data necessary to maintain sufficient intact stability to withstand the critical damage

3.1.10 explains the possible effects of sustaining damage when in a less favorable condition

3.1.11 distinguishes between ships of Type ‘A‘ and Type ‘B‘ for the purposes of computation of freeboard

3.1.12 describes the extent of damage which a Type "A" ship of over 150 meters length should withstand

3.1.13 explains that a Type “A” ship of over 150 meters length is described as a “one- compartment ship”

3.1.14 describes the requirements for survivability of Type ‘B‘ ships with reduced freeboard assigned

3.1.15 summarizes the equilibrium conditions regarded as satisfactory after flooding

3.1.16 states that damage to compartments may cause a ship to sink as a result of:
- insufficient reserve buoyancy, leading to progressive flooding
- progressive flooding due to excessive list or trim
- capsizing due to loss of stability structural failure

Competence

F3 Module 5: Use of Leadership and Managerial Skills

1. Personnel Management, Organization and Training on Board Ship

1.1 Shipboard personnel management and training

1.1.1 Principles of controlling subordinates and maintaining good relationships

- identifies sources of authority and power
- discusses theories on how effective authority and power may be enhanced or diminished by management level officers on ships
- reviews theories in cultural awareness and cross cultural communication
- discusses strategies that management level officers could adopt to enhance their effectiveness in managing crews of different cultures
- reviews theories in human error, situational awareness, automation awareness, complacency and boredom
- discusses strategies that management level officers can adopt to optimize situational awareness and to minimize human error and complacency of individuals and teams
- reviews theories in leadership and teamwork
- discusses strategies that management level officers can adopt to enhance leadership and teamwork
- discusses theories of personnel motivation and relates these to shipboard situations encountered by management level officers
- explains that an individual‘s motivation and well being may be effected by both real and perceived influences on board ship and at home
- discusses strategies that management levels officers could adopt to optimize the motivation of individuals and teams
- discusses theories on coaching individuals and teams to improve performance
- discusses approaches to managing and improving the performance of oneself, individuals and teams
- prepares for and conducts a simulated formal performance review

- identifies the impact of repeated harassment including bullying on individuals
- recognizes indications that crew members may be physically or mentally unwell or badly demotivated
- describes strategies that can be adopted when a crew member is believed to be physically or mentally unwell or badly demotivated
- describes strategies that management level officers can take to ensure that crew remain physically well and are encouraged to remain physically active
- explains the need for management level officers to be fully familiar with the requirements of national law relating to crew employment and of all crew agreements in place on the ship
- discusses the process for signing on and discharging crew under national law
- discusses the need to ensure that new crew are appropriately certificated, competent and familiarized with the safety management system, security plan, working procedures and equipment of the ship
- explains that procedures for conducting investigations and applying consequences in disciplinary situations are governed by national law, codes of conduct, employment agreements and company procedures
- explains the process for investigating and applying consequences in disciplinary situations under relevant national law and procedures
- explains the formal process for addressing continuing levels of unacceptable performance by a crew member under national law
- explains the process for investigating and responding to incidents of harassment or bullying of crew members under national law
- explains requirements for handling crew wages, advances and allotments when this is done by management level officers on board ship

1.2 Training

1.2.1 Training methods

- reviews training methods that could be adopted on board ship
- discusses the effectiveness of training methods that can be adopted for training:

- in attitude
- in skills
- in knowledge

- describes the preparation needed before the start of a training session
- discusses methods for ensuring that crew are motivated to participate fully in training
- demonstrates how to conduct a training session for a given topic
- lists the areas in which training is required by regulation including the requirements of SOLAS
- identifies other topics where training might be desirable
- delivers a training session to other members of the class
- discusses the resources that may be available on board ship that can be used for training

2. Related international conventions, STCW recommendations and national legislation

2.1 The ISM Code

2.1.1 explains the principles underlying the ISM Code

2.1.2 describes the content and application of the ISM Code

2.2 STCW Convention

2.2.1 explains the principles underlying the STCW Convention

2.2.2 describes the content and application of the STCW Convention

2.2.3 explains how to implement the regulations for ensuring fitness for duty

2.2.4 states that seafarers new to a particular type of vessel require ship specific shipboard familiarization

2.2.5 describes what shipboard familiarization may involve for watchkeeping officers

2.2.6 describes what tasks or duties elementary basic safety familiarization involves for a watchkeeping officer

2.2.7 describes how to organize shipboard training and how to maintain records

2.2.8 states that penalties are prescribed for breaches of STCW Convention,1978, as amended requirements and that these are determined by the flag state

2.2.9 states that national legislation is required to implement the provisions of an international convention

2.2.10 states that for STCW Convention, 1978, as amended, national legislation is subject to scrutiny and checking by IMO appointed persons

2.2.11 states national legislation may differ from one flag to another

2.3 Maritime Labor Convention

2.3.1 demonstrates a working knowledge of the Maritime Labor Convention provisions relating to the management of personnel on board ship, with particular reference to:

- engagement of crew
- employment conditions
- crew entitlements and repatriation
- medical requirements

3. Application of task and workload management

3.1 Task and workload management

3.1.1 reviews theories on applying task and workload management from IMO Model Course 1.39, Leadership and Teamwork

3.1.2 explains that the scope of activity and conflict between activities managed by management level officers is broader than for operational level officers and requires greater task and workload management ability

3.1.3 plans the task and workload allocation for significant shipboard activities so that the following are considered:

- human limitations
- personal abilities
- time and resource constraints
- prioritization
- workload, rest and fatigue

3.1.4 discusses strategies to monitor the effectiveness of task and workload management during an activity and to adjust the plan as necessary

3.1.5 discusses strategies to ensure that all personnel understand the activity to be undertaken and their tasks in this

3.1.6 discusses whether the encouragement of a challenge and response environment is appropriate to the task and workload management of particular shipboard tasks

3.1.7 discusses the importance of debriefs and reflection after activities have been conducted to identify opportunities for improving task and workload management

4. Effective resource management

4.1 Application of effective resource management

4.1.1 reviews theories on effective communication

4.1.2 demonstrates effective communication in simulated or real situations involving communications on board ship and between ship and shore

4.1.3 discusses how management level officers can encourage other personnel to use effective communications

4.1.4 reviews theories on effective resource allocation, assignment and prioritization

4.1.5 demonstrates the effective allocation, assignment and prioritization of resources when managing simulated or real shipboard activities

4.1.6 reviews theories on decision making that considers team experience

4.1.7 demonstrates the ability to involve team member effectively in decision making when managing simulated or real shipboard activities

4.1.8 reviews theories on assertiveness and leadership

4.1.9 discusses appropriate leadership styles and levels of assertiveness for management level officers in a range of shipboard activities

4.1.10 demonstrates the ability to apply appropriate leadership styles and levels of assertiveness when managing simulated or real shipboard activities

4.1.11 reviews theories on obtaining and maintaining situational awareness

4.1.12 demonstrates the ability to obtain and maintain situational awareness when managing complex simulated or real shipboard activities

4.1.13 reviews theories on the use of short and long term strategies

4.1.14 demonstrates the ability to apply short and long term strategies when managing simulated or real shipboard activities

5. Decision-Making Techniques

5.1 Situation and risk assessment

5.1.1 reviews theories of situation and risk assessment

5.1.2 discusses formal and informal approaches to risk assessment

5.1.3 identifies typical risks that management level officers may have to assess

5.1.4 demonstrates the ability to effectively assess risk in the planning and conduct of simulated or real shipboard activities

5.2 Identify and generate options

5.2.1 reviews theories on identifying and generating options

5.2.2 demonstrate the ability to identify and generate options when making decisions as a management level officer in simulated or real shipboard activity

5.3 Selecting course of action

5.3.1 reviews theories on selecting the course of action in making decisions

5.3.2 demonstrate the ability to select appropriate courses of action when making decisions as a management level officer in simulated or real shipboard activity

5.4 Evaluation of outcome effectiveness

5.4.1 explains how to carry out the evaluation of outcome effectiveness and the importance of doing it

6. Development, implementation and oversight of standard operating procedures.

6.1 discusses approaches to developing standard operating procedures (SOP‘s)

6.2 explains the methods to implement the SOP‘s

6.3 explains why it may be desirable for there to be oversight and approval of many SOPs and explains the dangers associated with it

Competence

F3 Module 6: Organize and manage the provision of medical care on board.

1. Medical publications

1.1 The use and content of International Medical Guide for Ships, Medical Section of the International Code of Signals and Medical First Aid Guide for Use in Accidents involving Dangerous Goods

1.1.1 International Medical Guide for Ships

- describes the content and application of the above publication
- extracts and applies information for given situations

1.1.2 International Code of Signals (Medical Section)

- describes the content and application of the above publication constructs and interprets messages

1.1.3 Medical First Aid Guide for Use in Accidents involving Dangerous Goods

- describes the content and application of the above publication
- extracts and applies information for given situations

(End of the Course)