MARITIME AND PORT AUTHORITY OF SINGAPORE
SHIPPING CIRCULAR TO SHIP OWNERS
NO. 13 OF 2010

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Applicable to: This circular is for the attention of ship owners, managers, operators, agents, masters, crew members and surveyors

GUIDANCE ON SHIPBOARD OPERATIONAL MATTERS: CIRCULARS APPROVED BY THE 87th SESSION OF THE MARITIME SAFETY COMMITTEE (MSC 87) OF IMO

Related circular: Shipping circular no. 12 of 2010 – *Resolutions adopted by the 87th Session of the Maritime Safety Committee (MSC 87) of IMO*

1 The Maritime Safety Committee of IMO, at its 87th session (14–21 May 2010), approved a number of circulars which provide guidance to improve the safety and efficiency of shipboard operations. This shipping circular informs the Shipping Community of the MSC circulars, as listed below. Queries should be directed to the contact officer/s concerned.

a. Fire Safety

- MSC.1/Circ.1368 – Interim Clarifications of SOLAS chapter II-2 Requirements regarding Interrelation between the Central Control Station, Navigation Bridge and Safety Centre
  (for passenger ships constructed on or after 1 July 2010)

  The intent of the circular is to provide additional guidance for the uniform implementation of SOLAS regulation II-2/23 – *Safety centre on passenger ships*.

- MSC.1-Circ.1369 – Interim Explanatory Notes for the Assessment of Passenger Ship Systems' Capabilities after a Fire or Flooding Casualty
  (for passenger ships constructed on or after 1 July 2010)

  The *Interim Explanatory Notes* is intended to outline the process of verification and approval of a ship's design by the Administration when requirements relevant to safe return to port (SOLAS regulations II-1/8-1, II-2/21 and 22) are applied.

- MSC.1-Circ.1370 – Guidelines for the Design, Construction and Testing of Fixed Hydrocarbon Gas Detection Systems
  (for oil tankers constructed on or after 21 May 2010)

  The MSC developed these Guidelines in order to assist in the implementation of amendments to SOLAS regulation II-2/4, adopted by resolution MSC.291(87), and chapter 16 of the FSS Code, adopted by resolution MSC.292(87), which require the fitting of fixed hydrocarbon gas detection systems on double hull spaces of double hull oil tankers.

  MPA accepts the guidance given in the circulars and ship owners and managers should approach the class of their vessels for further details.

  Contact officer: Mr Ong Hua Siong (tel: 6375-6210)

b. Dangerous Goods

- MSC.1-Circ.1360 – Carriage of Dangerous Goods: IMDG Code Annexes and Supplements

  The circular contains amendments to the *Emergency Response Procedures for Ships carrying Dangerous Goods* (EmS Guide), which are consequential to the amendments to the IMDG Code (35-10) adopted by resolution MSC.294(87). The amended IMDG Code enters into force on 1 Jan 2012.

  MPA accepts the application of the amendment 35-10 to the IMDG Code by shippers shipping dangerous goods with effect from 1 January 2011 on a voluntary basis, concurrent with the existing IMDG Code.

- MSC.1-Circ.1361 – Revised Recommendations on the safe use of Pesticides in Ships applicable to the Fumigation of Cargo Transport Units

  These recommendations address the hazards to personnel arising from the operations involved in the carriage of fumigated cargo transport units. MSC 87 also agreed that the Revised Recommendations should not apply to the carriage of fresh food produced under controlled atmosphere.

  All personnel involved should apply the circular on or after 1 January 2011.

- MSC.1/Circ.1358 – Recommendations on the safe use of pesticides in ships

  The Recommendations supersedes older MSC circulars on the safe use of pesticides in ships and is updated to incorporate changes in the IMDG Code as well as the new IMSBC Code.

Ship owners and operators should take into account the recommendations in the circular when fumigation is carried out on ships.

Contact officer: Mr Philip Yeo Hock Beng (tel: 6325-2449)

c. Radiocommunications

- MSC.1-Circ.1364 – Revised International SafetyNET Manual

  SOLAS regulation IV/12.2 states that "Every ship, while at sea, shall maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the ship is navigating".

  In order to meet this requirement, SafetyNET has been developed, and is an international automatic direct-printing satellite-based service for the promulgation of navigational and meteorological warnings, meteorological forecasts, Search and Rescue (SAR) information and other urgent safety-related messages – maritime safety information (MSI) – to ships.

  This circular supersedes MSC/Circ.1064 and replaces the existing text of the International SafetyNET Manual from 1 January 2012.

  Ships should use the latest revised version of the International SafetyNET Manual from 1 January 2012.

- MSC.1-Circ.1365 – Commercially available Locating, Tracking and Emergency Notification Devices

  In view of the recent proliferation of non-406 MHz locating, tracking and emergency notification devices, and considering the challenges these devices present to SAR services, ICAO and IMO have provided cautionary information on these devices.

  Ship owners should be aware that these commercially available locating, tracking and emergency notification devices may not be compliant with internationally accepted performance standards and operational criteria for global distress alerting and therefore may be ineffective in emergency situations.

- MSC.1-Circ.1367 – Amendments to the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual

  The circular contains the latest amendments to the IAMSAR Manual.

  Shipowners should take note that the amendments become applicable on 1 June 2011.

- MSC.1-Circ.1366 – Medical Assistance at Sea – Yacht Racing

  The guidance contains recommendations for the organization of medical assistance for offshore racing to ensure that the telemedical assistance service (TMAS) can provide the best possible telemedical assistance together with the MRCC in charge of a SAR operation.

  Contact officer: Capt Pang Yock Foo (tel: 6325-2369)

d. Cargo Operations

- MSC.1/Circ.1351 – Interpretation of stowage and segregation requirements for BROWN COAL BRIQUETTES and COAL related to "hot areas" in the IMSBC Code

  The circular provides clarification on the term "hot areas" in the IMSBC Code where coal and brown coal briquettes should not be stowed adjacent to.

  Ships carrying coal and brown coal briquettes should taken into account the circular on the stowage of these cargoes.

- MSC.1/Circ.1352 – Amendments to the Code of Safe Practice for Cargo Stowage and Securing (CSS Code)

  The amendments concern the safe working conditions for personnel involved in container securing operations on deck and includes the Cargo Safe Access Plan, which spells out the safe access for personnel engaged in container securing operations.

- MSC.1/Circ.1353 – Revised Guidelines for the preparation of the Cargo Securing Manual

  The amendments concern the updating of the Guidelines and gives guidance on the preparation of the Cargo Securing Manual.

- MSC.1-Circ.1354 – Amendments to the Elements to be taken into account - Safe Stowage and Securing of Cargo Units and Vehicles in Ships

  The amendments concern the safety of personnel engaged in work connected with the stowage and securing of cargo units and vehicles in ships and include a new element: the Cargo Safe Access Plan, which spells out the safe access for personnel engaged in container securing operations.

  Containership owners are recommended to apply the circulars to containerships whose keels are laid or which are at a similar stage of construction on or after 1 January 2015. However, chapters 1 to 4 of the revised Guidelines (MSC.1/Circ.1353) apply to existing containerships as well.

- MSC.1-Circ.1355 – Amendments to the Guidelines for Securing Arrangements for the Transport of Road Vehicles on Ro-ro Ships (Resolution A.581(14))

  The amendments concern the required number and maximum securing loads of lashings.

  Ro-ro ship owners and operators should take into account the amendments to the Guidelines when transporting road vehicles on Ro-ro ships.

- MSC.1-Circ.1356 – Amendments to the Manual on Loading and Unloading of Solid Bulk Cargoes for Terminal Representatives

  The amendments revise the Manual to refer to the new IMSBC Code instead of the BC Code.

- MSC.1-Circ.1357 – Additional Considerations for the Safe Loading of Bulk Carriers

  An agreed loading/unloading plan between the terminal representative and master is a mandatory requirement under SOLAS regulation VI/7.3. The circular provides further considerations for the safe loading of bulk carriers, to reduce the likelihood of over-stressing the hull structure.

  Bulk cargo port operators are advised to take into consideration the circulars during the loading/unloading of ships carrying solid bulk cargoes and bulk carriers in their terminals.

- MSC.1-Circ.1363 – Interim Guidelines for the Construction and Equipment of Ships carrying Natural Gas Hydrate Pellets (NGHP) in bulk

  These Interim Guidelines provide information on appropriate safety measures for ships solely intended for the carriage of natural gas hydrate pellets (NGHP) in bulk (NGHP carriers), by providing information on the appropriate application of the requirements of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) to NGHP carriers.

  Persons in charge of the design, construction and operation of NGHP carriers are invited to consult these Interim Guidelines.

  Contact officer: Mr Ong Hua Siong (tel: 6375-6210)

e. Container Safety

- CSC.1-Circ.138 – Revised Recommendations on Harmonized Interpretation and Implementation of the International Convention for Safe Containers (CSC)

  The amendments consolidate a number of older CSC circulars.

  Containership owners and operators and container terminal operators should take note of the contents of the circular.

  Contact officer: Mr Ong Hua Siong (tel: 6375-6210)

f. FPSOs AND FSUs

- MSC-MEPC.2-Circ.9 – Guidance for the Application of Safety, Security and Environmental Protection Provisions to FPSOs and FSUs

  The circular brings together specific guidance on the application of the SOLAS Convention, ISM Code, the Load Lines Convention, MARPOL Convention and the STCW Convention to FPSOs and FSUs.

  MPA accepts the guidance given in the circular and owners and managers of FPSOs and FSUs should approach the class of their vessels for further details.

  Contact officer: Mr Ong Hua Siong (tel: 6375-6210)

g. High-speed Craft (HSC)

- MSC.1-Circ.1349 – HSC Compliance with Provisions of SOLAS Regulations V-18 - V-20 and chp 13 of 2000 HSC Code

  The interpretation contained in the circular allows for HSC to be equipped with navigation equipment and systems that take advantage of the latest technological developments permitted by SOLAS chapter V, provided the equipment is equivalent to the requirements of chapter 13 of the 2000 HSC Code or higher.

  MPA accepts the application of the interpretation. HSC owners should apply to MPA on a case-by-case basis.

  Contact officer: Mr Ong Hua Siong (tel: 6375-6210)

h. Load Lines

- LL.3-Circ.194 – UI of the 1966 LL Convention and the 1988 LL Protocol as modified by Resolution MSC.143(77)

  The unified interpretation covers regulation 24 (Freeing ports), regulation 26 (Special conditions for assignment of type “A” ships) and regulation 27 (types of ships: permeability).

MPA accepts the interpretation contained in the circular and is applicable to ships constructed on or after 21 May 2010.

Contact person: Mr Ong Hua Siong (tel: 6375-6210)

i. Safety of Navigation

- SN.1-Circ.286/Corr.1 – Routeing Measures other than Traffic Separation Schemes

  The circular contains new routeing measures and amendments to existing routeing measures:

  (i) new two-way route "Salvorev" in the waters north of Gotland island (0000 hours UTC on 1 January 2011);
  (ii) new Area To Be Avoided and two new mandatory No Anchoring Areas in the vicinity of the proposed "Neptune deepwater port" in the western North Atlantic Ocean, off the coast of the United States (0000 hours UTC on 1 December 2010);
  (iii) new deep-water route including associated routeing measures consisting of a traffic separation scheme, two Areas To Be Avoided and a precautionary area leading to the new Jazan Economic City Port (JEC Port) (0000 hours UTC on 1 January 2011); and
  (iv) amendments to the existing deep-water route leading to Ijmuiden (0000 hours UTC on 1 December 2010).

  The aforementioned routeing measures will be implemented at the times as indicated above.

- SN.1-Circ.287 –Mandatory Ship Reporting Systems

  The amendments to existing mandatory ship reporting systems are as follows:

  (i) In the Strait of Gibraltar (GIBREP) (amended system); and
  (ii) The Western European Particularly Sensitive Sea Area (WETREP) (amended system).

  The amendments to these existing mandatory ship reporting systems will be implemented at 0000 hours UTC on 1 December 2010.

  Masters of ships are advised that they are required to comply with the requirements of the adopted ship reporting systems, in accordance with regulation V/11.7 of SOLAS.

- COLREG.2-Circ.61 – New and Amended Existing Traffic Separation Schemes

  The new and amended existing traffic separation schemes and associated routeing measures are as follows:

  (i) "Adlergrund" (new scheme) (0000 hours UTC on 1 December 2010);
  (ii) "Slupska Bank" (new scheme) (0000 hours UTC on 1 December 2010);
  (iii) "West Klintehamn" (new scheme) (0000 hours UTC on 1 January 2011);
  (iv) "Midsjöbankarna" and "South Hoburgs Bank" (new schemes) (0000 hours UTC on 1 January 2011);
  (v) "In the area off south-western coast of the Crimea" (new scheme) (0000 hours UTC on 1 December 2010);
  (vi) "Off Cape Roca" (amended scheme) (0000 hours UTC on 1 December 2010);
  (vii) "Off Cape S. Vicente" (amended scheme) (0000 hours UTC on 1 December 2010);
  (viii) "Off Porkkala Lighthouse" (amended scheme) (0000 hours UTC on 1 December 2010);
  (ix) "Off Kalbådagrund Lighthouse" (amended scheme) (0000 hours UTC on 1 December 2010); and
  (x) "Off Hankoniemi Peninsula" (amended scheme) (0000 hours UTC on 1 December 2010).

  The aforementioned TSS will be implemented at the times as indicated above.

- SN.1-Circ.288 – Guidelines for Bridge Equipment and Systems, their Arrangement And Integration (BES)

  These Guidelines replaces the existing Performance Standards for Integrated Bridge Systems (IBS)(resolution MSC.64(67), Annex I).

  Ship owners and operators should take into consideration the guidance in the circular when applying SOLAS regulation V/15.

- MSC.1/Circ.1350 – Unified Interpretations of SOLAS regulation V/22.1.6 relating to navigation bridge visibility

  The UI contained in the circular is based on an IACS interpretation, which was developed with a view to providing more specific guidance for vague expressions such as "The ship's side shall be visible from the bridge wing", which are open to different interpretations contained in IMO instruments.

  Ship owners and operators should comply with the UI when applying relevant provisions of SOLAS chapter V to ships contracted for construction on or after 1 January 2011.

- SN.1-Circ.289 – Guidance on the use of AIS Application-specific Messages

  The circular provides specific guidance on the use of AIS Application-specific messages, including the prevention of overloading of the VHF data link (VDL) and maintaining the performance of the AIS equipment for its primary role, i.e. the identification and tracking of ships.

- SN.1-Circ.290 – Guidance for the Presentation and Display of AIS Application-specific Messages Information

  The circular provides guidance on the presentation and display of AIS Application-specific messages with illustrative examples.

  AIS Application-Specific Messages are not mandatory under SOLAS. However, users should take note of the guidance in the circulars when working with this type of communication.

  Contact officer: Capt Sangam (tel: 6375-6205)

j. In-water Survey

- MSC.1-Circ.1348 – Guidelines for Assessment of Provisions for In-water Survey in lieu of Bottom Inspection in Dry-dock for Passenger Ships

  The Guidelines are intended to provide guidance on technical aspects to be considered when implementing a one in five-year dry-docking regime with an in-water survey in lieu of bottom inspection in dry-dock for passenger ships of 15 years of age or less, other than ro-ro passenger ships.

  MPA will apply the Guidelines contained in the circular on a case-by-case basis.

  Contact officer: Mr Ong Hua Siong (tel: 6375-6210)

2 Ship owners are urged to implement the recommendations in the circulars. They may approach the nine approved classification societies to seek further guidance.

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MSC.1/Circ.1368
22 June 2010

INTERIM CLARIFICATIONS OF SOLAS CHAPTER II-2 REQUIREMENTS REGARDING INTERRELATION BETWEEN THE CENTRAL CONTROL STATION, NAVIGATION BRIDGE AND SAFETY CENTRE

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Fire Protection, at its fifty-fourth session, approved the Interim Clarifications of SOLAS chapter II-2 requirements regarding interrelation between the central control station, navigation bridge and safety centre, set out in the annex, to provide additional guidance for the uniform implementation of SOLAS regulation II-2/23 which was adopted by resolution MSC.216(82) and are due to enter into force on 1 July 2010.

2 Member Governments are invited to bring the annexed Interim Clarifications to the attention of passenger ship owners, shipbuilders, ship designers and other parties concerned.

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ANNEX

INTERIM CLARIFICATIONS OF SOLAS CHAPTER II-2 REQUIREMENTS REGARDING INTERRELATION BETWEEN THE CENTRAL CONTROL STATION, NAVIGATION BRIDGE AND SAFETY CENTRE

1 The functionality of the safety systems stated in SOLAS regulation II-2/23.6 should be available from the safety centre systems under any envisaged emergency situation (other than casualty affecting the safety centre itself) and should be efficiently managed from the safety centre without distracting the bridge team*. The functionality of these systems within the safety centre is specified in appendix 1.

2 The safety centre may or may not be part of the navigation bridge. The safety centre may be considered as part of the navigation bridge when it is arranged as examples indicated in diagrams (a), (b) and (c) of the illustration in appendix 4. In case of arrangements such as in diagram (d) in appendix 4, the safety centre should be considered as not being part of the navigation bridge.

3 Where the safety centre is part of the bridge:

.1 it is acceptable to consider nearby members of the bridge team as being sufficient to make the safety centre "continuously manned";

.2 alarms in the safety centre should be audible at the conning position for responsible members of the bridge team to make them aware of an alarm condition; and

.3 at least one member of the on-watch bridge team should be properly trained and authorized to take appropriate initial and interim actions in the event of an emergency or in response to an alarm, until the safety centre is fully manned.

4 Where the safety centre is not part of the navigation bridge, it may or may not be continuously manned.

4.1 When the safety centre is continuously manned the functionality of the systems listed in appendix 2 should be duplicated on the Navigating Bridge.

4.2 When the safety centre is not continuously manned, there should be the capability on the navigation bridge to alert the bridge team of developing shipboard emergencies, to respond to them appropriately by taking initial and interim actions and to allow necessary monitoring functions after the safety centre is manned by properly trained persons. Therefore, the functionality of the systems listed in appendix 3 should be duplicated on the navigation bridge.

* For the purpose of these clarifications the term "bridge team" identifies the team on the bridge in charge of the navigation of the ship, i.e. performing navigational duties.

5 The hierarchy of control between the navigation bridge and safety centre should be specified within the shipboard safety management system. In this respect:

.1 an adequate number of properly trained personnel should be available for immediate response to the safety centre in an emergency while maintaining an effective navigational watch;

.2 the duties of the safety centre personnel and navigation bridge personnel should not overlap; and

.3 coordination of emergency management actions and communications should be assured through established emergency procedures, harmonized with the onboard decision support system required by SOLAS regulation III/29.

6 In carrying out the various functions on the navigation bridge and safety centre an integrated computer technology may be used.

7 When such a system is utilized:

.1 the hierarchy of control of the various computer stations and locations should be clearly documented;

.2 the computer system and programming should be designed to assure that failure of the system does not cause the loss of any of the ship's safety systems; and

.3 the operational status and failures of the computer system or its communications should be indicated.

8 Controls and monitoring of safety and security related systems other than those listed under SOLAS regulation II-2/23.6 may also be located in the safety centre.

APPENDIX 1

FUNCTIONALITY OF SYSTEMS TO BE LOCATED IN ONBOARD SAFETY CENTRE FUNCTIONAL REQUIREMENTS

System	Operation and control	Monitoring	Alarm
Powered ventilation systems	X	X	X*
Fire doors	X	X	
General emergency alarm system	X		
Public address system	X		
Electrically-powered evacuation guidance systems	X		
Watertight and semi-watertight doors	X	X	X
Indicators for shell doors, loading doors and other closing appliances		X	X
Water leakage of inner/outer bow doors, stern doors and any other shell door		X	X
Television surveillance system		X	
Fire detection and alarm system	X	X	X
Fixed fire-fighting local application system(s)		X	X
Sprinkler and equivalent systems		X	X
Water-based systems for machinery spaces		X	X
Alarm to summon the crew	X		
Atrium smoke extraction system	X		
Flooding detection systems			X
Fire pumps and emergency fire pumps	X	X	

* For ro-ro ships, SOLAS regulation II-2/20.3.1.3 applies.

APPENDIX 2

DUPLICATION ON NAVIGATING BRIDGE OF FUNCTIONALITY OF SYSTEMS LOCATED IN CONTINUOUSLY MANNED ONBOARD SAFETY CENTRE

System	Operation and control	Monitoring	Alarm
Powered ventilation systems			X*
Fire doors		X	
General emergency alarm system	X		
Public address system	X		
Watertight and semi-watertight doors	X	X	X
Indicators for shell doors, loading doors and other closing appliances (ro-ro ships)		X	X
Water leakage of inner/outer bow doors, stern doors and any other shell door (ro-ro ships)		X	X
Television surveillance system (ro-ro ships)		X	
Fire detection and alarm system	X**	X	X
Sprinkler and equivalent systems		X	X
Alarm to summon the crew	X		
Flooding detection systems			X
Fire pump (ships less than 1,000 gross tonnage)***	X		
Fire doors leading to or from the special category spaces (ro-ro ships)		X	X
Ventilation systems for vehicle, special category and ro-ro spaces		X	X

* For ro-ro ships, SOLAS regulation II-2/20.3.1.3 applies.
** Activation of the fire alarm should be possible from the navigating bridge.
*** Unless the automatic start of one fire pump is provided.

APPENDIX 3

DUPLICATION ON NAVIGATION BRIDGE OF FUNCTIONALITY OF SYSTEMS LOCATED IN ONBOARD SAFETY CENTRE NOT CONTINUOUSLY MANNED

System	Operation and control	Monitoring	Alarm
Powered ventilation systems	X		X*
Fire doors	X**	X	
General emergency alarm system	X		
Public address system	X		
Watertight and semi-watertight doors	X	X	X
Indicators for shell doors, loading doors and other closing appliances		X	X
Water leakage of inner/outer bow doors, stern doors and any other shell door		X	X
Television surveillance system		X	
Fire detection and alarm system	X***	X	X
Sprinkler and equivalent systems		X	X
Alarm to summon the crew	X		
Flooding detection systems			X
Fire pump (ships less than 1,000 gross tonnage)****	X		
Fire doors leading to or from the special category spaces (ro-ro ships)		X	X

* For ro-ro ships, SOLAS regulation II-2/20.3.1.3 applies.

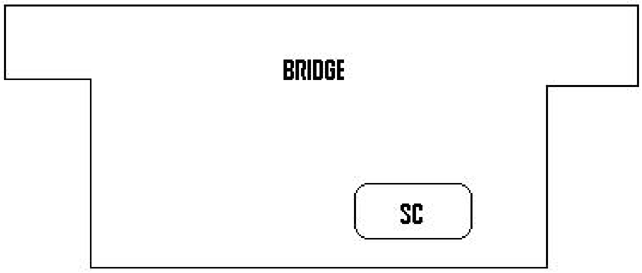
** Operation and control of the systems from the navigation bridge when the safety centre is unmanned, until the management of the emergency situation is transferred to the safety centre. This implies duplication of the systems and a function to transfer the commands and controls (bridge ↔ safety centre).

*** Activation of the fire alarm is to be possible from the navigation bridge.

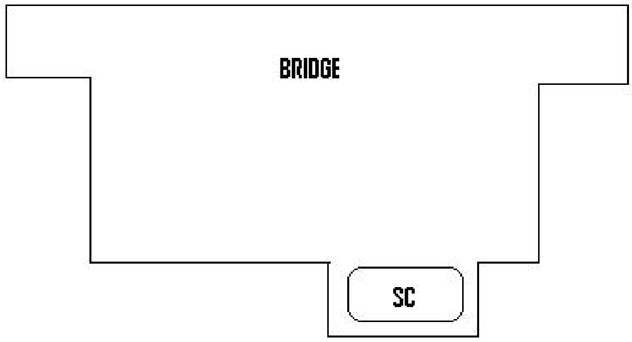
**** Unless the automatic start of one fire pump is provided.

APPENDIX 4

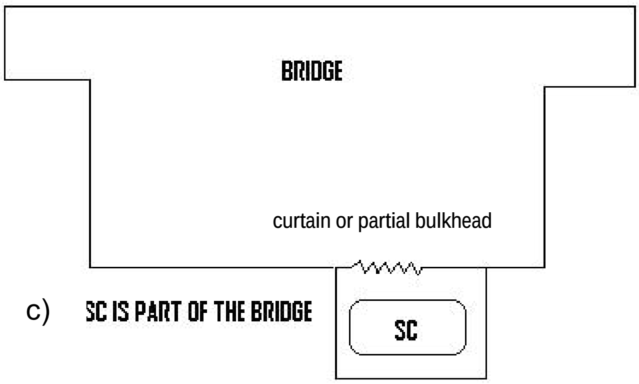
ILLUSTRATIONS AS TO WHEN A SAFETY CENTRE MAY OR MAY NOT BE CONSIDERED AS PART OF THE NAVIGATION BRIDGE



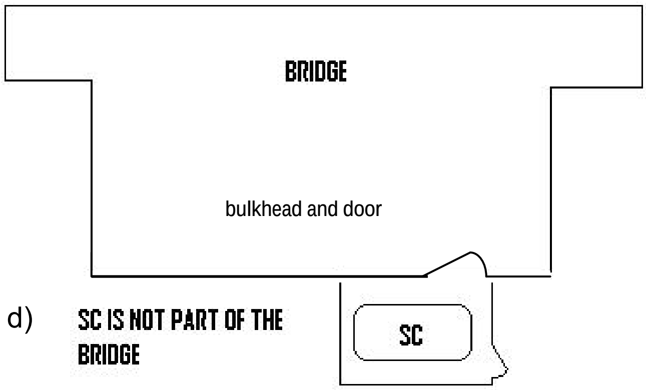
a) SC IS PART OF THE BRIDGE



b) SC IS PART OF THE BRIDGE



c) SC IS PART OF THE BRIDGE



d) SC IS NOT PART OF THE BRIDGE

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MSC.1/Circ.1369
22 June 2010

INTERIM EXPLANATORY NOTES FOR THE ASSESSMENT OF PASSENGER SHIP SYSTEMS' CAPABILITIES AFTER A FIRE OR FLOODING CASUALTY

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Fire Protection, at its fifty-fourth session, approved the Interim Explanatory Notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty, set out in the annex, to provide additional guidance for the uniform implementation of SOLAS regulations II-1/8-1, II-2/21 and II-2/22, which were adopted by resolution MSC.216(82) and are due to enter into force on 1 July 2010.

2 Member Governments are invited to bring the annexed Interim Explanatory Notes to the attention of passenger shipowners, ship builders, ship designers and other parties concerned.

3 This circular revokes circular MSC.1/Circ.1214.

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ANNEX

INTERIM EXPLANATORY NOTES FOR THE ASSESSMENT OF PASSENGER SHIP SYSTEMS CAPABILITIES AFTER A FIRE OR FLOODING CASUALTY

INTRODUCTION

The requirements relevant to the safe return to port for passenger ships, as contained in resolution MSC.216(82), entering into force on 1 July 2010, have been shown to be challenging.

These Interim Explanatory Notes have been developed in the light of the experience gained so far in the early application of the aforementioned requirements, taking into account the guidance contained in the Performance standards for the systems and services to remain operational on passenger ships for safe return to port and orderly evacuation and abandonment after a casualty (MSC.1/Circ.1214).

1 GENERAL

1.1 These Interim Explanatory Notes are intended to outline the process of verification and of approval of a ship's design by the Administration, as well as describing the necessary documentation required, when requirements relevant to safe return to port (regulations II-1/8-1, II-2/21 and 22 of the 1974 SOLAS Convention, as amended) are applied.

1.2 These Interim Explanatory Notes are also intended to support safe engineering design with guidance on all three scenarios to be considered in the light of the above mentioned regulations:

.1 availability of essential systems after a flooding casualty, according to SOLAS regulation II-1/8-1;

.2 availability of essential systems to support a ship's safe return to port after a fire casualty, according to SOLAS regulation II-2/21; and

.3 availability of essential systems to support a ship's evacuation and abandonment after a fire casualty, according to SOLAS regulation II-2/22.

In light of the above, general and specific interpretations to regulations II-2/21 and 22 of the 1974 SOLAS Convention, as amended are given in appendix 1.

1.3 The outcome of these assessments should confirm that the ship is designed and constructed to provide the capabilities required by SOLAS regulations II-1/8-1, II-2/21 and 22.

1.4 Within these Interim Explanatory Notes a system-based approach is primarily intended to be performed. Where a system approach will outline potential weaknesses, a compartment or space-by-space based approach may also be applied. In the latter case, part of or all the spaces subject to individual consideration may be subject to operational restrictions on access, use and installations as one element of the overall system of protection. All such spaces and their restrictions should be identified on drawings or in manuals as appropriate (see paragraphs 7.3 and 7.4). For the application of these Interim Explanatory Notes to be successful, all relevant parties, including the Administration or its designated representative, owners, operators, designers and classification societies, should be in continuous communication from the onset of a specific proposal to utilize these Interim Explanatory Notes.

1.5 A pre-requisite and starting point for this assessment is that the owner of the ship has defined the operating pattern or patterns of the ship (for instance, worldwide liner/cruise ship or point-to-point ferry operations, maximum number of passengers and crew for required routes, foreseeable area of operation and routes, etc.). The capabilities that will be needed to be built into the ship will depend on the above.

1.6 The Administration may (as per SOLAS regulation II-2/21.4.14) determine any system to remain operational after a casualty in addition to those identified.

2 DEFINITIONS

For the purpose of these Interim Explanatory Notes, the following definitions apply:

2.1 *Passenger ship systems' capabilities after a fire or flooding casualty (short: ship systems' capabilities)* are those required for passenger ships according to SOLAS regulations II-1/8-1, II-2/21 and II-2/22. The ship systems' capabilities are addressing:

- .1 availability of essential systems after a flooding casualty, according to SOLAS regulation II-1/8-1;
- .2 availability of essential systems to support a ship's safe return to port under its own propulsion after a fire casualty, according to SOLAS regulation II-2/21.4 (including functional requirements for safe areas according to SOLAS regulation II-2/21.5); and
- .3 availability of essential systems to support a ship's evacuation and abandonment after a fire casualty, according to SOLAS regulation II-2/22.

2.2 *Passenger ship systems' design (short: ship systems' design)* is a design description of systems intended to be installed, including all essential information showing how to achieve the ship systems' capabilities after a fire or flooding casualty according to SOLAS regulations II-1/8-1, II-2/21 and II-2/22.

2.3 *Passenger ship systems' functionality (short: ship systems' functionality)* is part of the passenger ship systems' design and defines how the onboard systems achieve the functional requirements defined in SOLAS regulations II-2/21 and II-2/22.

2.4 *Fire casualty* is any possible fire case on board the ship under consideration. Fire casualties may or may not exceed the casualty threshold stipulated in SOLAS regulation II-2/21.3.

2.5 *Flooding casualty* is any possible flooding case~~s~~ on board the ship under consideration. Flooding casualties may not exceed a single watertight (WT) compartment flooding as stated in SOLAS regulation II-1/8-1.2.

2.6 Essential systems are all systems and those sections of systems in spaces not directly affected by the casualty that need to remain operational after a fire or flooding casualty, according to SOLAS regulations II-2/21.4 and II-2/22.3, and as referred to in SOLAS regulation II-1/8-1.2.

2.7 *Critical systems* are essential systems that were identified in the overall assessment of essential systems to have a possibility to fail to operate adequately as a consequence of one or more fire casualty case, each not exceeding the fire casualty threshold, or as a consequence of one or more flooding case, each not exceeding a single WT compartment. The failure of the system may be caused by a failure of the whole system, of one component or of a connection between system components or by any other failure causing unsatisfactory operation of the essential system under consideration.

3 SHIP'S DESCRIPTION

3.1 For the purpose of the ship's description, any necessary information regarding the design of the ship should be provided to the Administration along with description of ship essential systems' design and functionality following a fire or flooding casualty. As a minimum, such information and description should include:

.1 the design criteria for each individual essential system or group of essential systems, to achieve compliance (e.g., separation, duplication, redundancy, protection, or a combination of the above);

.2 the basic layout of the vessel including boundaries of compartments subject to the casualty (watertight or "A" class boundaries), e.g., in the form of plan views and cross-sections, including, but may not be limited to: general arrangement plan, capacity plan, watertight subdivision plan, space fire categorization plan (or structural fire protection plan), plan of spaces protected by fixed fire-extinguishing systems, etc.;

.3 criteria adopted for the selection of safe areas and intended locations;

.4 a list of all systems that are intended to be submitted for assessment. It should be noted that although such a list would include, in the first instance and as a minimum, all essential systems referred to in SOLAS regulations II-2/21.4 and 22.3, their actual number and identification may vary depending on the size, type, arrangements, design, etc., (e.g., propulsion systems: shaft or podded propulsion units, etc.) of the ship;

.5 drawings/documents describing the location, arrangement and connections of essential systems (including any of their components) mentioned in SOLAS regulation II-2/21 or II-2/22;

.6 the description of the power supply for the essential systems;

.7 data regarding the minimum speed vs. weather and sea conditions (e.g., results of model tank tests in sea keeping conditions including consideration of wind forces); and

.8 any additional design detail intended to ensure or support the ship systems' capabilities.

3.2 Additional information about the intended area of operation, the operating pattern or patterns (which may be used to define any intended speed/maximum distance for safe return to port) should be included in the ship's description.

3.3 Interpretations as contained in paragraph 1 of appendix 1 to these Interim Explanatory Notes may be used when completing the ship's description.

4 ASSESSMENT OF REQUIRED SHIP SYSTEMS' CAPABILITIES

4.1 The assessment of ship systems' capabilities should follow the process described in these Interim Explanatory Notes and refer to appendix 2. The assessment should be based on structured methods and should document the intended essential systems functionality after a fire or flooding casualty defined by SOLAS regulations II-1/8-1, II-2/21 and II-2/22. An example of the development of an assessment is given in appendix 3.

4.2 Each assessment should be divided in two steps.

4.2.1 The first step is an overall systems' assessment. The systems' assessment is addressing all essential systems and functional requirements mentioned in SOLAS regulations II-2/21 and II-2/22. This step should include a structured assessment of all essential systems after a fire or flooding casualty, as defined in SOLAS regulations II-1/8-1.2, II-2/21.4 or II-2/22.3.1. Propulsion and steering systems are required to remain in operational and may not be identified as "critical systems". However, manual intervention may be accepted in order to make these systems available in the minimum possible time.

4.2.2 The second step is a detailed assessment of critical systems identified in the systems' assessment. The detailed assessment is only required if any critical system was identified in the previous systems' assessment.

4.3 SOLAS regulations II-1/8-1, II-2/21 and 22 do not include reference to quantities or performance limits. The ability of the ship to return to port should be linked to the area and conditions of operation. The capability available for each system in the worst case (e.g., minimum propulsion power for return to port, electrical generating capacity, heating capacity, ventilation capacity, food and water storage/availability, etc.) should be included in the onboard documentation as a part of the assessment report (see paragraph 7.4).

5 OVERALL ASSESSMENT OF ESSENTIAL SYSTEMS

5.1 Assessment of all essential systems

5.1.1 A structured assessment of all essential systems should be conducted. The systems' assessment can be performed in qualitative terms. Quantitative analysis may be required as part of the detailed systems' assessment as described in section 6. A systems' assessment report should be prepared according to section 7.

5.2 Identification of critical systems

5.2.1 Essential systems identified to be fully redundant for all fire and flooding casualty cases not exceeding the threshold (e.g., when runs of cables, pipes and equipment are duplicated and adequately separated), need not be further analysed as described in section 6.

5.2.2 For the arrangement of equipment, components or connections reference may be made to relevant interpretations contained in paragraph 2 of appendix 1 to these Interim Explanatory Notes. Where other solutions are adopted, equipment, components or connections should be further analysed as described in section 6.

5.2.3 Manual action by the crew, to provide ship systems' capabilities, may also be possible but should be assessed in detail taking into account that:

.1 manual action should only be acceptable by the Administration in connection with an agreed defined number of fire and flooding casualties and should be clearly described in the documentation that should be prepared as per section 7;

.2 compliance with the return to port criteria should be based on the assumption that any manual action that may be required for the ship to return to port, or for any essential system to remain operational, following a casualty:

  .1 is pre-planned, pre-set and instructions as well as necessary materials are available on board;

  .2 is performed on systems designed to ensure that the required manual action can be completed within one hour from the time the action started; and

  .3 emergency lighting and a means of communication is demonstrated available in the area where manual actions are to be taken; and

.3 in general, feasibility of manual actions should be demonstrated by tests or drills, as applicable.

5.2.4 Performance requirements applicable to any essential system may be analysed and documented separately; however, any relevant information should be included in the overall assessment of essential systems' report.

5.3 Results of overall assessment

5.3.1 Should no critical systems be identified, the overall assessment can be considered acceptable without the need for a detailed systems' assessment to be carried out. The systems' assessment report can be used for the preparation of documentation and approval submission, as referred to in section 7.

6 DETAILED ASSESSMENT OF CRITICAL SYSTEMS

6.1 When performing a detailed assessment of critical systems, additional information may be necessary. The ship's description, described in section 3, should be supplemented, for each identified critical system, with the following, as applicable:

.1 details of pipes, cables or other devices connecting the components of the critical system, or connecting different critical systems including their location within the affected area;

.2 details of any manual action providing the required ship systems' functionality (see also paragraph 5.2.3); and

.3 details of any operational solution forming part of the design criteria.

6.2 Where acceptable to the Administration, a quantitative analysis can be carried out as a part of the detailed assessment of all critical systems. As an example, the following may be performed:

.1 quantitative analysis of fire risk within a space, supplemented by fire engineering analysis and/or fire testing where necessary (e.g., to assess consequences of a fire casualty on a system or system component);

.2 Failure Mode Effect Analysis (FMEA) of a system or system component analyses in accordance with standard IEC 60812, *Analysis techniques for system reliability – Procedure for failure mode and effects analysis (FMEA)* or resolution MSC.36(63), annex 4 (Procedures for Failure Mode and Effects Analysis), would be acceptable; and

.3 detailed analysis of possibility of flooding of internal watertight compartments and of consequences of flooding on system components, given the location of the compartment and arrangement of piping within the compartment.

7 DOCUMENTATION

7.1 Design of ship and ship's systems

7.1.1 Different design criteria may be followed in the design of the ship and in the design of the ship's systems and arrangements to achieve the passenger ship systems' capabilities after a fire or flooding casualty and to comply with the requirements. The chosen design criteria should be well documented. This is to form the basis for the preparation of all ship's operational procedures to be adopted by the crew for the case of any such casualty.

7.2 Documentation for future design changes

7.2.1 The documentation to be presented for approval is described in detail in the paragraphs below. Such documentation should also be referred to in case design changes to the ship are proposed and may also be used as evidence of compliance should the ship transfers to the flag of another State.

7.3 Documentation of the assessment of required ship systems' capabilities for approval

7.3.1 The documentation of the assessment to be presented for approval should include the design criteria followed to reach ship systems' capabilities and summarize the whole process of assessment including methods and assumptions. The following information should be provided for approval of ship systems' capabilities:

.1 ship's description (see section 3);

.2 overall assessment of essential systems' report (see paragraph 4.2.1 and section 5);

.3 detailed assessment of critical systems' report (see paragraph 4.2.2 and section 6), if any critical system is identified; and

.4 additional information:

  .1 list of manual actions (see paragraph 5.2.3);

  .2 test programme (for both testing during construction, and sea trials, as applicable) which should include methods of testing, and test facilities provided, where applicable;

  .3 maintenance plan; and

  .4 references.

7.4 Onboard documentation

The onboard documentation demonstrating the ship system capabilities should include:

.1 documentation, as per paragraphs 7.3.1.1, 7.3.1.2 and 7.3.1.3 above;

.2 operational manual for fire and flooding casualty cases and safe return to port operation, including details of any manual action required to ensure operation of all essential systems, availability of safe areas including provision of basic services therein (e.g., closing/opening of valves, shutting down/start of equipment/fans, etc.);

.3 description of operation of essential systems after a fire casualty exceeding the casualty threshold;

.4 list of spaces considered having negligible fire risk, if any; and

.5 test, inspection, and maintenance plan.

7.5 Record of ship systems' capabilities

7.5.1 The ship systems' capabilities should be included in the list of operational limitations issued to passenger ships (reference SOLAS regulation V/30). The ship's safety management manual should describe in detail the quantities, arrangements and procedures that are to be applied in each particular case. (For example, food/drink/fuel carriage requirements may be different for a ship cruising in the Aegean to one cruising in the Antarctic.) Example of wording concept for this purpose may be as follows:

"Safe return to port voyage planning should be based on:

.1 habitable conditions for passengers and crew is provided according to "Owners document xyz" dated yyyy-mm-dd (the operational area will determine maximum possible distance to a safe location and the maximum number~~s~~ of persons that can be supported during the safe return voyage).

.2 the ship systems' capabilities of returning to port following a fire casulaty is contingent upon the conditions/assumptions given in onboard document xyz, yyyy-mm-dd.

.3 ships "port/aft/main" propulsion and steering system is capable of x knots in Beaufort x with a consumption of x tonnes of fuel.

.4 ships "starboard"/forward/emergency propulsion and steering system is capable of x knots in Beaufort x with a consumption of x tonnes of fuel.".

APPENDIX 1

INTERPRETATIONS TO SOLAS REGULATIONS II-2/21 (SAFE RETURN TO PORT AND SAFE AREAS) AND II-2/22 (SHIP'S ORDERLY EVACUATION AND ABANDONMENT)

1 Interpretation for ship's description

1.1 The following interpretations are intended to be of assistance when carrying out the ship description contained in section 3 of the Interim Explanatory Notes, before performing assessments as described in sections 4, 5 and 6.

1.2 These interpretations provide design criteria. The decision on whether or not to evacuate the ship remains with the Master. In actual situations the Master may well decide, based on the actual appraisal of the situation that it is safer to evacuate for accidents that are below the casualty threshold and remain on board for accidents that are above it.

Regulation	Interpretations
II-2/21.1 Application	**Interpretation 1** Horizontal Fire Zones (special category and ro-ro spaces) should not be included in the count of the number of the Main Vertical Zones.
II-2/21.1 Application	**Interpretation 2** Where electrical or machinery installation, fire safety, or lifesaving appliances of a ship have been approved following the methodology of SOLAS regulations II-1/55, II-2/17 or III/38 respectively (Alternative design and arrangements), the effect on the ship essential system capability should be explicitly included in the analysis required by the above regulations. Special attention is to be given to the determination and assignment of Safe Areas and compliance with the requirements of SOLAS regulation II-2/22.
II-2/21.2 Purpose	**Interpretation 3** For the purpose of assessing the ship systems' capabilities, fire casualties and flooding casualties may be considered as not occurring at the same time.
II-2/21.3 Casualty threshold	**Interpretation 4** "A" class boundaries refers to both bulkheads and decks.

Regulation	Interpretations
II-2/21.3 **Casualty threshold**	**Interpretation 5** The rating of "A" class boundaries does not affect the application of this regulation. However, a trunk closed at all boundaries constructed to "A-60" standard and containing ducts, cabling and/or piping is considered operational when passing through a space of origin.
II-2/21.3 **Casualty threshold**	**Interpretation 6** The lay-out of special category and ro-ro spaces, normally extending for more than the length of one MVZ, does not properly fit with the casualty threshold. However, during the assessment of the ship systems' capabilities it has to be verified that a casualty in such spaces would not compromise the operation of the essential systems in the remaining fire zones of the ship.
II-2/21.3.2 **Casualty threshold**	**Interpretation 7** Where a space of origin is not protected by a fixed fire-extinguishing system, for determining the "nearest "A" class boundaries, which are not part of the space of origin": a) only the spaces within the same Main Vertical Zone need to be considered; and b) casualty threshold includes spaces one deck upwards.
II-2/21.3.2 **Casualty threshold**	**Interpretation 8** Spaces in which the risk of a fire originating is negligible[1] need not be considered as spaces of origin of a fire. Examples of such spaces include but may not be limited to: a) spaces with restricted accessibility for inspection and/or maintenance only, such as: .1 void spaces; .2 trunks closed at all boundaries only containing pipes and/or electrical cables; and .3 cofferdams;

[1] **Note**: A fire/risk assessment may be requested (refer to paragraphs 7.4.4 of the Interim Explanatory Notes), to determine whether a space other than those listed in the above can be considered as being "space in which the risk of a fire originating is negligible". Different factors should be taken into account while performing the assessment such as:
a) presence of combustible material, flammable liquids and/or flammable gases;
b) presence of electrical switchboards and relevant power;
c) statistics on fire within spaces having the same purpose;
d) intended service of equipment/machinery installed; and
e) other factors considered appropriate for the space under consideration.

Regulation	Interpretations
II-2/21.3.2 **Casualty threshold**	**Interpretation 8 (cont'd)** b) tanks; c) chain lockers; d) ventilation trunks except those containing ducts presenting fire hazard such as galley range exhaust ducts, laundry exhaust ducts, category "A" machinery spaces ducts, special category and ro-ro spaces ducts; e) cross flooding ducts connecting void spaces. In the case where connected spaces are not with a negligible fire risk, ducts should be separated from those spaces by non-watertight fire resistant boundaries to be considered as a space where fire risk is negligible; f) vertical escape trunks from machinery spaces, service spaces, control stations and other crew accommodation spaces; g) store rooms for gaseous fixed fire-extinguishing systems; h) busbars enclosed in "A" class divisions; i) "A" class enclosures within spaces of Category 1, 2 or 4 only containing isolation valves or section valves forming part of the fixed fire-extinguishing system for the protection of accommodation spaces, service spaces and control stations; and j) shaft tunnels only used for this purpose, i.e. no storage is allowed.
II-2/21.3.2 **Casualty threshold**	**Interpretation 9** Concealed spaces (spaces above ceilings, behind bulkheads linings) are considered as part of the space of origin. Lack of a fixed fire-extinguishing system above ceilings or behind linings need not be considered under regulation II-2/21.3.2.
II-2/21.3.2 **Casualty threshold**	**Interpretation 10** In case of manual actions, equipment and systems the controls of which cannot be reached without accessing the space affected by the casualty should not be considered operational.
II-2/21.3.2 **Casualty threshold**	**Interpretation 11** For passenger ships carrying not more than 36 passengers space of origin is any space bounded by "A" class boundaries or divisions of steel or equivalent material. Where the deck between two spaces is constructed of steel or equivalent material it should be considered to form part of the "A" class boundary provided all penetrations are tight to prevent the passage of flame or smoke.

2 Interpretations for detailed assessment of critical systems

2.1 The following interpretations are intended to be of assistance when performing detailed assessments of critical systems, as described in section 6.

Regulation	Interpretations
II-2/21.4 **Safe Return to Port/Fire Casualty**	**Interpretation 12** Steel pipes other than those carrying flammable liquids and passing through (not serving) spaces affected by a fire casualty may be considered to remain operational provided they are of substantial thickness (reference can be made to ICLL 66 regulation 22(3), as interpreted by IACS UI LL36/Rev. 2 paragraph (b)) or "A-60" insulated ("A-60" class insulation approved in accordance with resolution A.754(18) for bulkheads or decks may be used for this purpose). In both cases the pipes should be adequately supported. In order to be considered as remaining operational after a fire casualty, steel pipes should be joined by welding otherwise mechanical joints should be tested according to IACS UR P2.11.5.5.6 fire test or equivalent to the satisfaction of the Administration. Temperature increase of liquids carried may need to be considered, and measures taken where necessary, so that the performance and purpose of the affected systems can be maintained as intended after the casualty has occurred. Plastic pipes can be considered to remain operational after a fire casualty if tested to resolution A.753(18), Level 1.
II-2/21.4 **Safe Return to Port/Fire casualty**	**Interpretation 13** Fire-resistant cables complying with standards IEC 60331-1 and IEC 60331-2 (see also IACS UR E15) passing through (not serving) spaces may be considered to remain operational after a fire casualty provided they have no connections, joints and equipment connected to them, etc., within the space affected by the casualty. Installation of these cables should be made to support their survival in a fire casualty and during fire fighting efforts.

Regulation	Interpretations
II-2/8.1 **Flooding casualty** **II-2/21** **Fire casualty**	**Interpretation 14** An electrical balance should be submitted for each of the following return to port scenarios: a) minimum electrical-generating capacity available; and b) any other scenario of reduced power that would cause any essential system to run at reduced capacity due to lack of electrical generating capacity. In connection with the above, all essential systems and their auxiliaries and systems needed to support safe areas should be accounted according to their use in these particular conditions.
II-2/21 **Fire casualty**	**Interpretation 15** Emergency generator, fitted for compliance with SOLAS regulation II-1/42, may be used to meet the requirements on safe return to port and ship's orderly evacuation and abandonment providing that its ability to supply emergency services as referred to in SOLAS regulation II-1/42.2, is not impaired (e.g., the availability of fuel needed for providing those services listed in regulation II-1/42 should be maintained). In the evaluation of the emergency generator capacity, the most demanding condition between regulations II-1/42, II-2/21 and 22 may be considered.
II-2/21.4 **Safe return to port**	**Interpretation 16** Electrical power should be available and sustainable for all essential services specified in SOLAS regulations II-2/21.4 and II-2/21.5.1.2, with due regard being paid to such services as may be operated simultaneously. The application of regulation II-2/21.4 requires that other systems (e.g., engine-room ventilation, lighting of spaces outside safe areas not affected by the casualty, etc.) remain operational to support the functionalities listed therein.
II-2/21.4.1 **Propulsion**	**Interpretation 17** Propulsion machinery and auxiliary machinery essential for the propulsion of the ship should remain operable.
II-2/21.4.1 **Propulsion**	**Interpretation 18** Following a fire casualty within the threshold, the ship should be able to maintain an adequate speed for sufficient time to permit the ship's planned safe return to port in sea and wind conditions acceptable to the Administration taking into account the intended area of operation. A minimum speed of 6 knots while heading into Beaufort 8 weather and corresponding sea conditions is recommended. Configuration for power generation and propulsion in the worst case scenario in terms of casualty cases should be verified during normal sea trials.

Regulation	Interpretations
II-2/21.4.1 **Propulsion**	**Interpretation 19** A steel shaft line including relevant bearings passing through a space affected by a flooding or a fire casualty (see also interpretation 11), may be considered operational if it is enclosed in a watertight and "A" class tunnel or alternatively if: a) in the flooding case it can be shown that it can operate under water; and b) in the fire case it is protected by a dedicated water spray system capable of delivering not less than 5 *l*/m^2/min on the protected area or equivalent.
II-2/21.4.1 **Propulsion**	**Interpretation 20** Manual control at local positions can be accepted provided adequate communication and emergency lighting are arranged and it is demonstrated that the loss of any control and monitoring system does not prevent or impair any such manual/local control of the propulsion and electrical power generation systems (including, but may not be limited to, engines, electric motors, fuel system, etc.). Consideration should be given to the provision of machinery alarms when operating in that manner.
II-2/21.4.2 **Steering systems and steering-control systems**	**Interpretation 21** When documenting that steering system is operable the following should be taken into consideration: a) local control of remaining steering system is acceptable provided adequate communication and emergency lighting are arranged; b) emergency means of steering, e.g., azimuth thrusters, pump jets, rudder, propellers, may be considered; and c) in general, tunnel thrusters should not be considered adequate for emergency steering.
II-2/21.4.3 **Navigational systems**	**Interpretation 22** Equipment essential for navigation, position fixing and detection of risk of collision should be available. The ship should be capable of displaying the proper light configuration in compliance with the International Regulations for Preventing Collisions at Sea in force.
II-2/21.4.4 **Systems for fill, transfer and service of fuel oil**	**Interpretation 23** Systems for internal fill transfer and service of fuel oil should be capable of fuel transfer to active propulsion and power generation equipment.

Regulation	Interpretations
II-2/21.4.4 Systems for fill, transfer and service of fuel oil	**Interpretation 24** Systems for internal fill, transfer and service of: a) fuel; b) other flammable hydrocarbons; or c) any fluid that may be flammable or dangerous if heated to a very high temperature (both within the pipe and on going through pumps, orifices or other equipment), should not be considered operational within spaces affected by a fire casualty.
II-2/21.4.5 Internal communication between the bridge, engineering spaces, safety centre, fire-fighting and damage control teams, and as required for passenger and crew notification and mustering	**Interpretation 25** Internal communications should be achieved by any effective portable or fixed means of communications. However, portable equipment may be accepted provided that repeater system or equivalent remains operational after the casualty and charging capability is available in more than one MVZ.
II-2/21.4.5 Internal communication between the bridge, engineering spaces, safety centre, fire-fighting and damage control teams, and as required for passenger and crew notification and mustering	**Interpretation 26** PA systems, arranged as general alarm systems, should remain operational in the MVZs not affected by the casualty.

Regulation	Interpretations
II-2/21.4.6 **External communication**	**Interpretation 27** The ship should be capable of communicating via the GMDSS or the VHF Marine and Air Band distress frequencies, even if the main GMDSS equipment is lost.
II-2/21.4.7 **Fire main**	**Interpretation 28** Automatic start of remaining pumps may not be necessarily required (manual local start may be accepted after a casualty). The system should be so arranged that SOLAS regulation II-2/10.2.1.5.1 is fulfilled in all other Main Vertical Zones of the ship not affected by the casualty. Isolating valves should be arranged as appropriate. The remaining part of the affected deck in a Main Vertical Zone may be served from hydrants of adjacent zone or water tight compartment. Fire hoses may be extended for fire-fighting within the affected Main Vertical Zone; however, for complying with this requirement, two lengths of hoses from each hydrant may be accepted.
II-2/21.4.8 **Fixed fire-extinguishing systems**	**Interpretation 29** When a gaseous based system located outside the protected space is the sole fixed fire-extinguishing system as defined in regulations II-2/10.4.1 and 10.7.1 and it is designed to protect more than one space: a) there should be enough capacity to protect the two largest spaces; b) where the application of the fire casualty threshold leads to the loss of the storage room due to fire in an adjacent space, there should be two rooms, not being lost by the result of the same casualty, each holding a quantity of gas, capable of protecting the largest space; and c) the system should be so arranged that a casualty in one protected space does not impair the operation of the system in another protected space. When a gaseous based system located outside the protected space is the sole fixed fire-extinguishing system as defined in regulations II-2/10.4.1 and 10.7.1 and it is designed to protect a single space, where the application of the fire casualty threshold leads to the loss of the storage room due to fire in an adjacent space, there should be two rooms, not being lost by the result of the same casualty, each holding the quantity of gas required for the protected space.
II-2/21.4.8 **Fixed fire-extinguishing systems**	**Interpretation 30** Sprinkler or equivalent fixed fire-extinguishing systems may be considered to be lost only in spaces directly affected by the fire casualty and in other spaces that are protected by the same section (i.e. are controlled by the same section valve) provided each section should not serve more than one deck area in one MVZ. However, all levels of a stairway enclosure may be protected by the same section.

Regulation	Interpretations
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 31** Section valves (as referred to in FSS Code, chapter 8, paragraph 2.4.2.2) located within the space affected by the fire casualty should be considered to be not operational unless they are suitably fire rated or fire protected (e.g., contained within a solely dedicated enclosure having "A" class boundaries, or protected by a water nozzle, etc.).
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 32** Equivalent water based fire-extinguishing systems intended for the protection of machinery spaces (total flooding, as referred to in MSC/Circ.1165, as amended) should be so designed that in case of loss of any section valve it would still be possible to supply the entire system at the required performance, except where another fixed fire-extinguishing system is provided for the protection of such spaces (e.g., gaseous based systems). Duplication, fire protection of valves (e.g., contained within a solely dedicated enclosure having "A" class boundaries, or protected by a water nozzle, etc.), fire rated valves* or location of valves in spaces as identified by interpretation 11 may be considered. * Reference may be made to IACS UR P2.11.5.5.6.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 33** Indication of activated sections in the continuously manned central control station for sprinkler or equivalent fixed fire-extinguishing systems, located outside the Main Vertical Zone, where the space affected by the casualty is located, should continue to function after a fire or flooding casualty.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 34** Arrangement of piping distribution for sprinkler systems or equivalent, or for water based fixed fire-extinguishing systems for machinery spaces, may include isolation valves, to ensure the system can be reconfigured as to remain operational after a casualty, which should be kept to a minimum, clearly marked and easily accessible. Valves whose uncorrected status may jeopardize the operation of the system under normal condition should be provided with status indication in the continuously manned control station.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 35** When sprinkler or equivalent water based fixed fire-extinguishing systems include one or more emergency feed, risers, connection, or other emergency means to comply with this regulation, then hydraulic calculations (as referred to in the FSS Code, chapter 8, paragraph 2.3.3.2) should take this into account.

Regulation	Interpretations
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 36** Local application systems need not to remain operational following a casualty unless they form part of a system for the protection of machinery spaces (total flooding, as referred to in MSC/Circ.1165, as amended).
II-2/21.4.9 Fire and smoke detection systems	**Interpretation 37** Fire and smoke detection systems may be considered to be lost only in spaces directly affected by the fire casualty and in other spaces on the same deck that are part of the same section, as defined by the FSS Code, chapter 9, paragraph 2.4.1, provided that all other detectors remain operational in any other decks served by that section.
II-2/21.4.10 Bilge and ballast systems	**Interpretation 38** The bilge and ballast pumping systems and all associated essential equipment should be operational in all spaces served by the systems and not directly affected by the casualty. Manual control at local positions may be accepted provided fixed or portable means of communication are available from those positions to the Safety Centre or the Engine Control room.
II-2/21.4.11 Power-operated watertight and semi-watertight doors	**Interpretation 39** Indication to show whether each door is open or closed should be provided for any fire casualty not exceeding the casualty threshold except for those doors in the boundary of spaces directly affected by the casualty.
II-2/21.4.13 Flooding detection systems	**Interpretation 40** Flooding detection systems may be considered to be lost only in spaces directly affected by the fire casualty and in other spaces in the same compartment that are part of the same section provided that all other detectors remain operational in any other compartment served by that section.
II-2/21.5 Safe areas	**Interpretation 41** When considering a fire casualty in a certain MVZ, only spaces within the casualty threshold are to be considered lost. Food, water and equipment for the support of the basic services to the safe areas, stored in spaces not directly affected by the fire casualty and belonging to the same MVZ, could be considered still available.

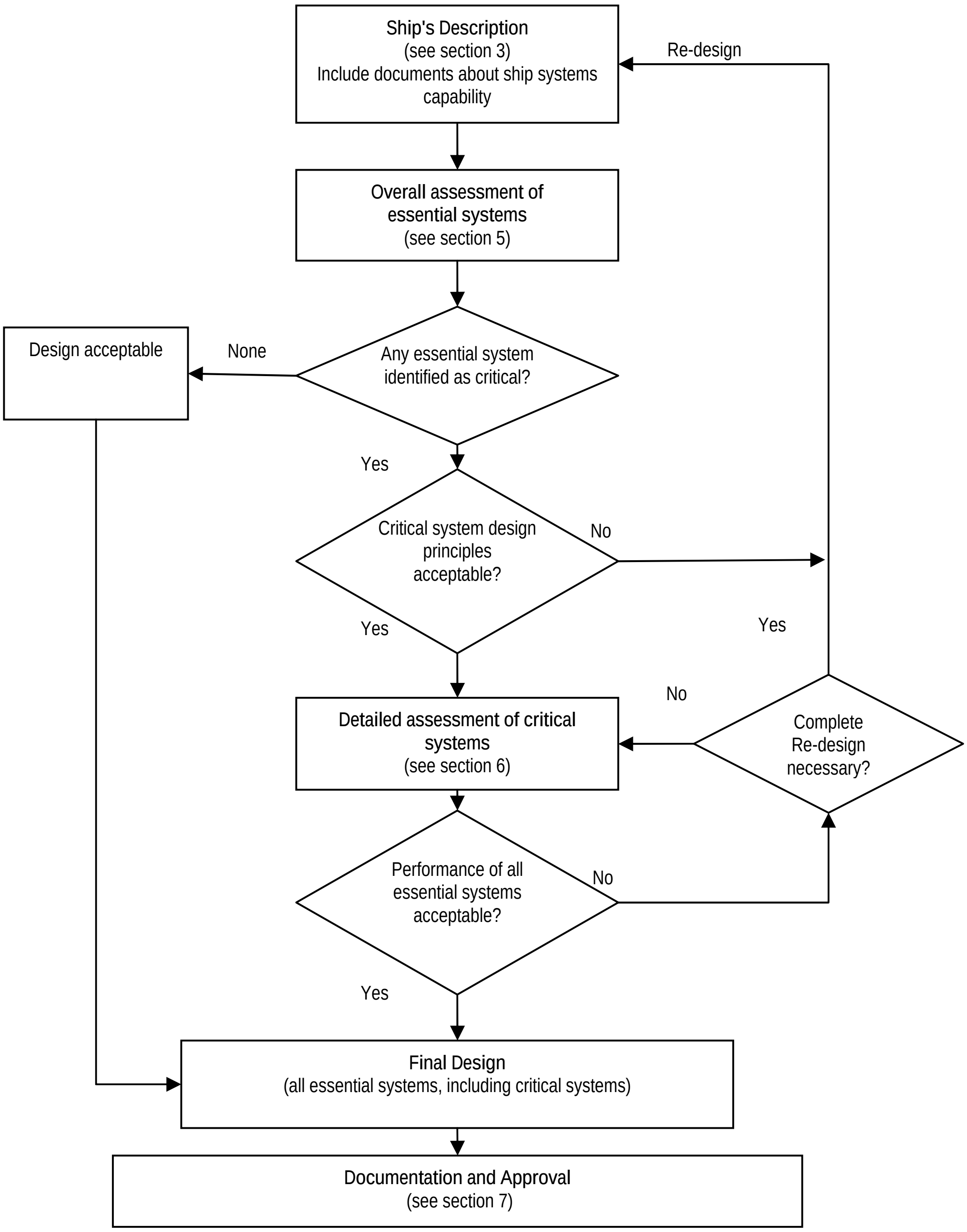
Regulation	Interpretations
II-2/21.5.1.1 **Safe areas** **Functional requirements**	**Interpretation 42** Safe areas could be a number of spaces distributed on board and should preferably be arranged in accommodation spaces. Sizing of safe areas where persons are accommodated could be based on the time needed for safe return to port operation. For safe return to port operations longer than 12 h a minimum space of 2 m^2 per person, calculated on the basis of the gross deck surface of the space(s) being considered, should be provided. For safe return to port operations shorter than 12 h a minimum space of 1 m^2 per person should be provided.
II-2/21.5.1.2.1 **Safe areas, sanitation**	**Interpretation 43** As a minimum one toilet for every 50 persons or fraction should remain operational. Grey and black water can be disposed of into the sea, allowed by MARPOL (reference MARPOL Annex IV, regulation 3).
II-2/21.5.1.2.2 **Safe areas, water**	**Interpretation 44** As a minimum 3 litres per person per day drinking water should be available. Additional water for food preparation and hygiene may need to be provided.
II-2/21.5.1.2.3 **Safe areas, food**	**Interpretation 45** Food could be of any kind including dry food. Storage of food should be distributed as necessary, so that an access route is available from the safe areas.
II-2/21.5.1.2.4 **Safe areas** **Alternate space for medical care**	**Interpretation 46** In addition to the ship's hospital or medical centre one or more locations on the ship should be provided which should: a) be in a different Fire Zone (from the hospital or primary medical centre); b) be easily accessible; and c) have lighting and power supply on the main and emergency source of electrical power. Reference should also be made to MSC/Circ.1129.

Regulation	Interpretations
II-2/21.5.1.2.6 **Means of preventing heat stress and hypothermia**	**Interpretation 47** Definition of means for protection against heat stress and hypothermia should take into account external weather conditions, which may depend on area(s) of operation of the vessel. Casualty scenarios for which there is a reduction in ventilation or heating capacity should be identified and consequences assessed. The temperature within the internal safe areas should be maintained in the range of 10 to 30°, consideration being paid to the external temperature during expected operations.
II-2/21.5.1.2.7 **Safe areas, light**	**Interpretation 48** Portable rechargeable battery operated lighting may be acceptable for use in spaces which are not covered by the ship's emergency lighting system. Adequate charging capability should be available for these lights. Supplementary lighting complying with regulation II-1/42-1 is also acceptable.
II-2/21.5.1.2.8 **Safe areas, ventilation**	**Interpretation 49** Ventilation volume should be available as a minimum of 4.5 m^3/h per person.
II-2/21.4.14 **Safe areas, other systems vital to damage control efforts**	**Interpretation 50** This includes any system that the Administration determines is vital to damage control pertaining to fire or flooding.
II-2/21.5.1.4 **Safe areas, access to embarkation deck**	**Interpretation 51** Means of access from safe areas to life-saving appliances should be provided from all safe areas in case of any casualty, either internally through areas unaffected by the fire or via external routes. External routes are considered to remain available also in the portion of the ship containing the MVZ where the casualty had occurred.
II-2/22.3.1 **Evacuation and abandonment, Systems**	**Interpretation 52** Electrical power should be available for the abandonment of the ship, including life-saving appliances and arrangements and the systems referred to in SOLAS regulation II-2/22.3.1, with due regard being paid to such services as may be operated simultaneously.

Regulation	Interpretations
II-2/22.3.1.1 Evacuation and abandonment, Fire Main Safe	**Interpretation 53** The fire main should remain operational in all main vertical zones not directly affected by the casualty. Water for fire-fighting purposes should be available to all areas of the ship.
II-2/22.3.1.2 Evacuation and abandonment, Internal communications	**Interpretation 54** A means should be available for communicating orders to fire-fighting and damage control teams and personnel in charge of evacuation and abandonment.
II-2/22.3.1.4 Evacuation and abandonment, Means of external	**Interpretation 55** The ship should be capable of communicating via the GMDSS or the VHF Marine and Air Band distress frequencies even if the main GMDSS equipment is lost.
II-2/22.3.1.3 Evacuation and abandonment, Bilge system	**Interpretation 56** The bilge pumping system and all associated equipment essential for its operation should be available in all spaces not directly affected by the casualty.

APPENDIX 2

Assessment of passenger ship systems' capabilities process flowchart



APPENDIX 3

EXAMPLE OF THE DEVELOPMENT OF AN ASSESSMENT
(refers to an assessment for SOLAS regulation II-2/22)

Note: Users should note that the example provided represents one way of handling an assessment as other approaches could be equally effective.

The assessment is developed adopting the following steps:

Step 1 – Identification of all essential systems and any required auxiliaries and support systems.

Step 2 – For each deck of each MVZ, determination of which essential systems are present.

Step 3 – For each essential system that is located in the MVZ under analysis, verification of the availability of an alternative in another location.

Step 4 – Essential systems without a suitable alternative in another location must be protected from a fire/flooding casualty.

Step 5 – For each critical system, determination of how the cables, pipes, components will be protected. A hierarchy for protecting critical systems is proposed as follows:

1. First solution – Provide an alternative in a MVZ not affected by the casualty

Example: A main power cable for the GMDSS system passes through the MVZ on deck 3. In a fire this cable could be damaged. An emergency power cable is routed from a different direction to the navigation bridge that does not pass through this area. The conclusion is that further analysis is not needed. Damage to the power cable does not affect the ship's safe return to port capability.

2. Second solution – Protect the essential system within the MVZ under analysis

Example: In the case of the a.m. power cable, it is determined that only a short length of cable passes through the MVZ under consideration, located 5 m above the deck. An A-60 trunk is installed to protect the cable to preclude fire damage.

3. Third solution – Provide a repair or manual action to compensate for loss of the system

Example: – Another essential system cable is analysed, and it is determined that the cable is routed throughout the MVZ at various levels and construction of an A-60 trunk is not practicable. Instead, a repair cable is prepared and staged with necessary tools at a protected location. If the cable is damaged from a fire in the MVZ under analysis, the crew is able to temporarily re-route power from another location using the repair cable.

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MSC.1/Circ.1370
22 June 2010

GUIDELINES FOR THE DESIGN, CONSTRUCTION AND TESTING OF FIXED HYDROCARBON GAS DETECTION SYSTEMS

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Fire Protection, at its fifty-fourth session, with regard to the amendments to SOLAS regulation II-2/4, adopted by resolution MSC.291(87), and chapter 16 of the FSS Code, adopted by resolution MSC.292(87), approved Guidelines for the design, construction and testing of fixed hydrocarbon gas detection systems, as set out in the annex.

2 Member Governments are invited to apply the annexed Guidelines when approving fixed hydrocarbon gas detection systems in accordance with paragraph 5.7.3 of SOLAS regulation II-2/4 and chapter 16 of the FSS Code, and bring them to the attention of ship designers, shipowners, equipment manufacturers, test laboratories and other parties concerned.

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ANNEX

GUIDELINES FOR THE DESIGN, CONSTRUCTION AND TESTING OF FIXED HYDROCARBON GAS DETECTION SYSTEMS

1 GENERAL

1.1 Application

These Guidelines apply to fixed hydrocarbon gas detection systems required for oil tankers by SOLAS regulation II-2/4.5.7 and chapter 16 of the International Code for Fire Safety Systems (FSS Code). These Guidelines apply to ships constructed on or after 21 May 2010.

1.2 Definitions

1.2.1 *Alarm setpoint* is a fixed or adjustable setting at which the system will automatically indicate an alarm. The FSS Code, chapter 16, limits the maximum alarm setpoint to the equivalent of 30% of the lower flammable limit.

1.2.2 *Calibration* is the process of confirming the accuracy of the detector readings by comparison with a standard.

1.2.3 *Detection time* is the time interval, measured in seconds, between the time a change in the gas concentration occurs at the gas analysis unit, and the time the unit registers a reading of 90% of the gas concentration, also known as T(90).

1.2.4 *Detector* is the sensing element which measures the gas concentration.

1.2.5 *Extraction* is the physical removal of vapours from a space by means of a pump.

1.2.6 *Extraction time* is the time interval, measured in seconds, between the time a gas sample enters the gas sampling pipe and the time it reaches the gas analysis unit.

1.2.7 *Gas analysis unit* is the assembly in which the detector is housed, along with any associated analysis components.

1.2.8 *Gas concentration* is the amount of gas or vapour being measured, as expressed in % LFL.

1.2.9 *Lower flammable limit (LFL)* is the volume fraction of gas or vapour below which an explosive atmosphere does not form. Also referred to as lower explosive limit (LEL).

1.2.10 *Response time* is the sum of extraction time and detection time.

1.2.11 *Sampling pipes* are the means by which gas is conveyed from the spaces being monitored to the gas analysis unit, including any fittings, valves or filters.

1.2.12 *Sampling point* is the entrance to a sampling pipe inside a ballast or void space.

1.2.13 *Span calibration gas* is a gas mixture of known concentration used for calibration/adjustment of the gas analysis unit.

1.2.14 *System* refers to the fixed hydrocarbon gas detection system.

1.2.15 *Zero calibration gas* is a gas which is free from flammable gases, used for calibration/adjustment of the apparatus zero point.

1.2.16 *Zero point* is the gas concentration at which the gas analysis unit registers zero.

2 ENGINEERING SPECIFICATIONS

2.1 General

2.1.1 The system should consist of a control panel housing the gas analysis unit and sample extraction pump(s), connected to gas sampling pipes, and one or more indicating units.

2.1.2 The system should be capable of continuously measuring hydrocarbon gas concentrations, and may be arranged to operate on a sequential scanning principle, provided that each sampling line of each protected space is analysed at intervals not exceeding 30 min.

2.1.3 The system should be provided with a means to monitor air flow acceptable to the Administration.

2.1.4 Means should be provided to prevent ballast water from entering the system.

2.1.5 The system should have ingress protection suitable for the installed location of each component. In any event, the system should be designed such that dust may not enter in sufficient quantity to interfere with the satisfactory operation of the equipment and water splashing against the enclosure from any direction has no harmful effect.

2.1.6 Enclosures containing electrical components such as gas analysis units, extraction pumps, and alarm control devices should be of gas-tight construction having doors fitted with gaskets. Electrical components which would reasonably be expected to come into contact with sample gases should be explosion-proof.

2.1.7 The system should be designed, constructed and installed to prevent the leakage of hydrocarbon gases into any accommodation and service spaces, control stations or machinery spaces.

2.1.8 The system should be designed to withstand supply voltage variations and transients, ambient temperature changes, vibration, humidity, shock, impact, and corrosion normally encountered on ships, and to avoid the possibility of ignition of a flammable gas mixture.

2.1.9 The switchover sequence should be designed to keep changing the sampling line of each protected space according to a planned sequence, even if flammable gas above the alarm level is detected at a sampling point.

2.2 Component requirements

2.2.1 The gas analysis unit should be:

- .1 designed and tested according to standard IEC 60079-29-1, or alternative standards acceptable to the Administration;
- .2 capable of accurately measuring gas concentrations between 0% and 200% of the alarm setpoint defined by paragraph 1.2.1; and

.3 designed to prevent tampering or unauthorized interference with the alarm setpoint.

2.2.2 *Extraction pumps*

2.2.2.1 Extraction pumps should have sufficient power and be of adequate capacity to operate with the normal conditions of ventilation in the protected spaces with the connected sampling pipe sizes to ensure a response time in accordance with paragraph 2.1.2 for all sampling points.

2.2.2.2 Main and back-up extraction pumps of equal power and capacity should be provided and arranged to automatically switch over to the back-up pump in case of failure of the main pump. Alternatively, any failure of the main extraction pump should be automatically indicated and at least one spare extraction pump or equivalent parts should be provided on board.

2.2.3 *Sampling pipes*

2.2.3.1 Sampling pipes should be constructed of stainless steel, or other corrosion resistant materials acceptable to the Administration, and should be a minimum of 6 mm in inner diameter.

2.2.3.2 The location, number and arrangement of sampling points within a space should be determined in consideration of design parameters including the configuration of the space, internal obstructions, the length and internal diameter of sampling pipes, the extraction pump capacity, and the density of the vapours of the oil products intended to be carried.

2.2.3.3 Sampling pipes located within ballast tanks should be of sufficient strength to withstand hydrostatic pressure when in the most severe ballast condition.

2.2.3.4 Sampling pipes should be arranged to prevent progressive flooding upon failure.

2.2.3.5 Sampling pipes should be provided with a suitable connection for the fitting of portable detection equipment.

2.2.3.6 Sampling pipes should include a means to prevent blockage from debris accumulation.

2.2.3.7 Sampling pipes should be self-draining.

3 SYSTEM CONTROL REQUIREMENTS

3.1 Control panels and indicating units

3.1.1 The control panel should be located in the cargo control room, on the navigation bridge, or in a gas safe continuously manned central control station.

3.1.2 Clear information should be displayed on or adjacent to the control panel to allow the crew to readily determine the source of the alarm or fault condition.

3.1.3 The control panel should have a button or switch to manually reset to normal operating condition after alarm and fault conditions are cleared.

3.1.4 An indicating unit should be located on the navigation bridge if the control panel is located elsewhere.

3.1.5 Control panel and indicating unit alarm signals should be distinct from fault condition signals.

3.1.6 Indicating units may have common alarms servicing multiple sampling points, provided that all sampling points within an alarm group are located in the same space.

3.1.7 Control panels should have the capability to manually test audible and visual alarms.

3.2 Alarm conditions

3.2.1 Audible and visual alarms in accordance with the Code on Alerts and Indicators should be initiated on the navigation bridge, at the control panel, and at all indicating units under the following conditions:

.1 upon detection of gas concentrations above the alarm setpoint in any monitored space;

.2 in a fault condition, such as power failure or short-circuit;

.3 low or no flow in any sampling pipe;

.4 tampering with the alarm setpoint; or

.5 failure of any self-test functions described in paragraph 4.1.4.

3.2.2 A visual alarm should remain in effect while an alarm condition is present. The audible alarm may be silenced manually.

3.2.3 The gas concentration inside the control panel enclosure should be monitored. Upon detection of gas concentrations above the alarm setpoint within the enclosure, in addition to the alarm, the gas analysis unit should be automatically isolated from all sampling pipes and shut down. Appropriate measures should be taken to vent flammable gas inside the enclosure to an open space away from ignition sources.

4 MAINTENANCE AND CALIBRATION

4.1 Maintenance

4.1.1 The following onboard maintenance should be carried out monthly and after any fault condition:

.1 visual inspection;

.2 testing of audible and visual alarms; and

.3 zero and span calibrations as described in paragraph 4.2.

4.1.2 Additional maintenance should be carried out as specified by the manufacturer's instructions.

4.1.3 The maintenance and testing described in paragraphs 4.1.1 and 4.1.2 should be included in the maintenance plans required by SOLAS regulations II-2/14.2.2 and II-2/14.4.4.

4.1.4 Computerized systems should have a self-test function to monitor the following on start-up and repeated at least once every 24 h:

.1 power supply; and

.2 volatile memory.

4.2 Calibration

4.2.1 The system should be designed to permit onboard calibration by the crew.

4.2.2 Calibration of the detector should be performed with a zero calibration gas and a span calibration gas.

4.2.3 The span calibration gas should be:

.1 methane, for systems intended for sensing methane and hydrocarbon mixtures containing methane;

.2 propane for systems intended for sensing hydrocarbon mixtures not containing methane; or

.3 the actual gas or a chemically similar gas with a comparable flammable range.

4.2.4 The concentration of the span gas used for calibration should be equal to the alarm setpoint as defined in paragraph 1.2.1, or as determined by the Administration.

5 OPERATING AND MAINTENANCE INSTRUCTIONS

Operating and maintenance instructions for the system should be provided on board that includes the following information:

.1 operating instructions;

.2 the gases for which the system is suitable;

.3 system diagrams showing sampling points and the relationship of all components;

.4 transfer functions relating the output relative to the calibration gas to other gases;

.5 calibration and maintenance procedures;

.6 trouble-shooting procedures;

.7 minimum and maximum flow rates; and

.8 nature and significance of fault signals.

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MSC.1/Circ.1360
27 May 2010

CARRIAGE OF DANGEROUS GOODS

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE

ANNEXES AND SUPPLEMENTS

Amendments to the Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide)

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), approved amendments to the Emergency response procedures for ships carrying dangerous goods (EmS Guide) (MSC/Circ.1025, as amended by MSC.1/Circ.1025/Add.1 and MSC.1/Circ.1262), set out in the annex, consequential to the amendments to the IMDG Code adopted by resolution MSC.294(87).

2 Member Governments are invited to bring the annexed amendments to the EmS Guide to the attention of all concerned noting that the aforementioned amendments to the IMDG Code are expected to enter into force on 1 January 2012. However, their provisions may be applied on a voluntary basis from 1 January 2011, as agreed to by MSC 87.

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ANNEX

AMENDMENTS TO THE EMERGENCY RESPONSE PROCEDURES FOR SHIPS CARRYING DANGEROUS GOODS (EmS GUIDE) (MSC/Circ.1025, as amended by MSC.1/Circ.1025/Add.1 and MSC.1/Circ.1262)

Emergency Schedules for SPILLAGE

SPILLAGE SCHEDULE Charlie

S-C
FLAMMABLE, CORROSIVE LIQUIDS

Special cases:

1 Replace "2030 (if flammable)" with "3484".

SPILLAGE SCHEDULE Whisky

S-W
OXIDIZING GASES

Special cases:

2 Delete the UN No.1014 from the schedule.

3 In the second column of UN 1072 and 1073, replace "in some" with "after a short".

4 Delete the entry for UN 1003 and the sentence "This is compressed air. No inhalation or ignition hazard".

INDEX

5 In entry UN 0501 replace "S-X" with "S-Y".

6 In entry UN 1072 replace "S-W" with "<u>S-W</u>".

7 In entry UN 1073 replace "S-W" with "<u>S-W</u>".

8 Delete the row for entry UN 1366.

9 Delete the row for entry UN 1370.

10 Delete the row for entry UN 1512.

11 Delete the row for entry UN 1649 (if flammable).

12 In entry UN 1866 replace "S-E" with "<u>S-E</u>".

13 In entry UN 1972 replace "F-D" with "F-D".

14 Delete the row for entry UN 2005.

15 Delete the row for entry UN 2030 (if flammable).

16 Delete the row for entry UN 2445.

17 Delete the row for entry UN 2455.

18 In entry UN 2990 replace "S-V" with "S-V".

19 Delete the row for entry UN 3051.

20 Delete the row for entry UN 3052.

21 Delete the row for entry UN 3053.

22 In entry UN 3072 replace "S-V" with "S-V".

23 Delete the row for entry UN 3076.

24 Delete the row for entry UN 3433.

25 Delete the row for entry UN 3461.

26 In the index, add the following new entries in numerical order:

UN No.	**EmS Fire**	**EmS Spill**
0509	F-B	S-Y
1471	F-H	S-Q
3166 (for gases)	F-D	S-U
3166 (for liquids)	F-E	S-E
3171	F-I	S-I
3482	F-G	S-N
3483	F-E	S-D
3484	F-E	S-C
3485	F-H	S-Q
3486	F-H	S-Q
3487	F-H	S-Q
3488	F-E	S-D
3489	F-E	S-D
3490	F-G	S-N
3491	F-G	S-N
3492	F-E	S-D
3493	F-E	S-D
3494	F-E	S-E
3495	F-A	S-B
3496	F-A	S-I

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MSC.1/Circ.1361
27 May 2010

REVISED RECOMMENDATIONS ON THE SAFE USE OF PESTICIDES IN SHIPS APPLICABLE TO THE FUMIGATION OF CARGO TRANSPORT UNITS

1 The Maritime Safety Committee, at its eighty-fourth session (7 to 16 May 2008), approved the Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units (MSC.1/Circ.1265) to supersede MSC/Circ.612, as amended by MSC/Circ.689 and MSC/Circ.746 with regard to the fumigation of cargo transport units, proposed by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers at its twelfth session.

2 The Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its fourteenth session, with regard to the amendments to the IMDG Code which have been adopted at this session, approved Revised Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units, set out in the annex, which apply to the carriage of packaged dangerous goods in pursuance of the requirements of SOLAS regulation VI/4 and the relevant provisions of the IMDG Code.

3 The Committee agreed that the Revised Recommendations should not apply to the carriage of fresh food produced under controlled atmosphere.

4 Member Governments are invited to bring the Revised Recommendations to the attention of competent authorities, mariners, fumigators, fumigant and pesticide manufacturers and others concerned and to apply the circular on or after 1 January 2011.

5 The present circular supersedes MSC.1/Circ.1265.

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ANNEX

REVISED RECOMMENDATIONS ON THE SAFE USE OF PESTICIDES IN SHIPS APPLICABLE TO THE FUMIGATION OF CARGO TRANSPORT UNITS

1 INTRODUCTION

1.1 These recommendations address the hazards to personnel arising from the operations involved in the carriage of fumigated cargo transport units. This guidance is aimed at everyone involved in the supply chain. Although the contents of the cargo transport unit may not be subject to the provisions of the International Maritime Dangerous Goods (IMDG) Code, fumigating a cargo transport unit brings it into the scope of the IMDG Code. According to this Code the mandatory hazard communication provisions include:

.1 warning mark on cargo transport unit;

.2 documents (transport document and special list, manifest or detailed stowage plan) associated with the transport of cargo transport units that have been fumigated and have not been completely ventilated before transport; and

.3 instructions for disposal for any residual fumigant.

1.2 It is generally acknowledged, however, that there may be non-compliance with these provisions. Before entering the cargo transport units, all personnel should assess the risk as to whether it is safe to enter and determine the presence of fumigant by the use of gas detection equipment.

2 REASONS FOR FUMIGATION

2.1 General

2.1.1 The presence of insects and rodents on ships is clearly undesirable for various reasons, and in addition to aesthetic and nuisance aspects, they may damage equipment and spread disease and infection, contaminate food in galleys and food stores, and cause damage to cargoes that will result in commercial or other losses.

2.1.2 The same highly toxic chemicals are used in cargo transport units as on board bulk ships. However, when a cargo transport unit that contains fumigant chemicals leaves the place at which it was fumigated, no one can practically supervise the hazard unless they are aware of the presence of the fumigant. Any person who later enters the cargo transport unit can, therefore, be unknowingly exposed to dangerous levels of highly toxic chemicals.

2.2 Insects in cargo transport units

2.2.1 Grubs and larvae of insects and other species can infest cargo, as well as packaging, dunnage, etc., associated with the cargo, at any stage during harvesting, manufacture, processing, storage, packing or transport. These can spoil foodstuffs, textiles, leather goods, furniture, art and antiques, affect electronic equipment, contaminate sterile goods or deface consumer packaging or labelling, making the goods unfit for sale and therefore valueless.

2.2.2 Insect and mite pests of plant and animal products may be carried into the cargo transport unit with goods (introduced infestation); they may move from one kind of product to another (cross-infestation) and may remain to attack subsequent cargoes (residual infestation). Their control may be required to comply with phyto-sanitary requirements to prevent spread of pests and for commercial reasons to prevent infestation and contamination of, or damage to, cargoes of human and animal food.

2.3 Rodents

2.3.1 Rodents should be controlled not only because of the damage they may do to cargo or the ship's equipment, but also, as required by the International Health Regulations, to prevent the spread of disease. Importers, particularly those that operate food processing plants, make great efforts to eliminate infestation in order to prevent the invasion of the importer's local storage or processing plant from infestation carried in incoming cargo. Consequently, they regularly fumigate their premises and may insist that goods delivered to their premises are certified free of infestation by means of fumigation.

3 PROVISIONS FOR FUMIGATED CARGO TRANSPORT UNITS

3.1 General provisions

3.1.1 When transporting a fumigated cargo transport unit, the provisions of the IMDG Code shall apply. The relevant text is reproduced below:

"**5.5.2 Special provisions applicable to fumigated cargo transport units (UN 3359)**

5.5.2.1 General

5.5.2.1.1 Fumigated cargo transport units (UN 3359) containing no other dangerous goods are not subject to any provisions of this Code other than those of this section.

5.5.2.1.2 When the fumigated cargo transport unit is loaded with dangerous goods in addition to the fumigant, any provision of this Code relevant to these goods (including placarding, marking and documentation) applies in addition to the provisions of this section.

5.5.2.1.3 Only cargo transport units that can be closed in such a way that the escape of gas is reduced to a minimum shall be used for the transport of cargo under fumigation.

5.5.2.1.4 The provisions of 3.2 and 5.4.3 apply to all fumigated cargo transport units (UN 3359).

5.5.2.2 Training

Persons engaged in the handling of fumigated cargo transport units shall be trained commensurate with their responsibilities.

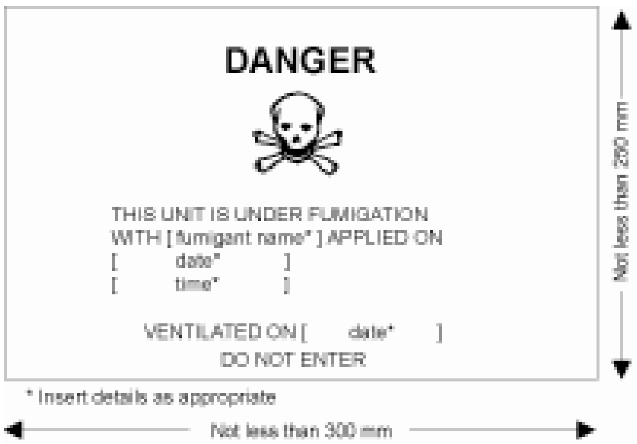
5.5.2.3 Marking and placarding

5.5.2.3.1 A fumigated cargo transport unit shall be marked with a warning mark, as specified in 5.5.2.3.2, affixed at each access point in a location where it will be easily seen by persons opening or entering the cargo transport unit. This mark shall remain on the cargo transport unit until the following provisions are met:

(a) The fumigated cargo transport unit has been ventilated to remove harmful concentrations of fumigant gas; and

(b) The fumigated goods or materials have been unloaded.

5.5.2.3.2 The fumigation warning mark shall be rectangular and shall not be less than 300 mm wide and 250 mm high. The markings shall be in black print on a white background with lettering not less than 25 mm high. An illustration of this mark is given below.



5.5.2.3.3 If the fumigated cargo transport unit has been completely ventilated either by opening the doors of the unit or by mechanical ventilation after fumigation, the date of ventilation shall be marked on the fumigation warning mark.

5.5.2.3.4 When the fumigated cargo transport unit has been ventilated and unloaded, the fumigation warning mark shall be removed.

5.5.2.3.5 Class 9 placards (Model No.9, see 5.2.2.2.2) shall not be affixed to a fumigated cargo transport unit except as required for other Class 9 substances or articles packed therein.

5.5.2.4 Documentation

5.5.2.4.1 Documents associated with the transport of cargo transport units that have been fumigated and have not been completely ventilated before transport shall include the following information:

.1 UN 3359, fumigated cargo transport unit, 9, or UN 3359, fumigated cargo transport unit, class 9;

.2 The date and time of fumigation; and

.3 The type and amount of the fumigant used.

5.5.2.4.2 The transport document may be in any form, provided it contains the information required in 5.5.2.4.1. This information shall be easy to identify, legible and durable.

5.5.2.4.3 Instructions for disposal of any residual fumigant including fumigation devices (if used) shall be provided.

A document is not required when the fumigated cargo transport unit has been completely ventilated and the date of ventilation has been marked on the warning mark (see 5.5.2.3.3 and 5.5.2.3.4).

5.5.2.5 Additional provisions

5.5.2.5.1 Cargo transport units shall be fumigated and handled taking into account the provisions of the Revised Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units (MSC.1/Circ.1361).

5.5.2.5.2 When fumigated cargo transport units are stowed under deck, equipment for detecting fumigant gas(es) shall be carried on the ship with instructions for their use.

5.5.2.5.3 Fumigants shall not be applied to the contents of a cargo transport unit once it has been loaded aboard the ship.

5.5.2.5.4 A fumigated cargo transport unit shall not be allowed on board until a sufficient period has elapsed to attain a reasonable uniform gas concentration throughout the cargo in it. Because of variations due to types and amounts of fumigants and commodities and temperature levels, the period between fumigant application and loading of the fumigated cargo transport unit on board the ship shall be determined by the competent authority. Twenty-four hours is normally sufficient for this purpose. Unless the doors of a fumigated cargo transport unit have been opened to allow the fumigant gas(es) and residues to be completely ventilated or the cargo transport unit has been mechanically ventilated, the shipment shall conform to the provisions of this Code concerning UN 3359. Ventilated cargo transport units shall be marked with the date of ventilation on the fumigated warning mark. When the fumigated goods or materials have been unloaded, the fumigation warning mark shall be removed.

5.5.2.5.5 The master shall be informed prior to the loading of a fumigated cargo transport unit.".

3.2 Shoreside fumigation operations: fumigated cargo transport units

3.2.1 Fumigated cargo transport units which have been ventilated

3.2.1.1 It is important to ensure that cargo transport units are properly ventilated by opening the doors and allowing the gas to escape. This can be a natural process, or can be accelerated by mechanical means such as blowers or extractors. The ventilation process can take many hours or even days.

3.2.1.2 When the cargo transport unit has been completely ventilated without unloading the cargo, the date of ventilation should be added to the fumigation warning mark in accordance with 5.5.2.3.3 of the IMDG Code. For such cargo transport units, a transport document and the instructions for disposal of any residual fumigant are not required.

3.2.1.3 Care should be taken even after a cargo transport unit has been declared as ventilated. Gas can be held in packages of cargo, then desorbed over a long period of time, even over many days, raising the level of gas inside the cargo transport unit to above the safe exposure level. Bagged cereals and cartons with large air spaces are likely to produce this effect. Alternatively, gas and the fumigant sachets or tablets can become "trapped" at the far end of a cargo transport unit by tightly-packed cargo.

3.2.2 Cargo transport units loaded without ventilation after fumigation (fumigation in transit)

3.2.2.1 A cargo transport unit containing cargo under fumigation should not be allowed on board until sufficient time has elapsed to allow the attainment of a reasonably uniform gas concentration throughout the cargo. Because of variations due to types and amounts of fumigants and commodities and temperature levels, the period between fumigant application and loading of the fumigated cargo transport unit on board the ship should be determined by the competent authority. Twenty-four hours is normally adequate for this purpose.

3.2.2.2 Transport of fumigated cargo transport units which have not been ventilated before loading onto the ship shall be in accordance with the provisions of the IMDG Code for UN 3359.

3.2.2.3 In column (17) (Properties and observations) of the Dangerous Goods list for UN 3359, the following information is given:

> "FUMIGATED CARGO TRANSPORT UNIT" is a closed cargo transport unit containing goods or materials that either are or have been fumigated within the unit. The fumigant gases used are either poisonous or asphyxiant. The gases are usually evolved from solid or liquid preparations distributed within the unit. See also 5.5.2."

3.2.3 Marking of the cargo transport unit

3.2.3.1 A fumigated cargo transport unit shall be marked with the warning mark, as specified in 5.5.2.3.2 of the IMDG Code. Class 9 placards shall not be affixed to the fumigated cargo transport units except as required by other class 9 substances or articles packed therein. This mark shall remain until the cargo has been unloaded. When the fumigated cargo transport unit is loaded with dangerous goods in addition to the fumigant, the cargo transport unit shall display the placards and marks relevant to these goods.

3.2.4 Documentation

3.2.4.1 When transporting a fumigated cargo transport unit that has not been completely ventilated, the transport document, which may be in any form and which shall contain the information regarding UN 3359, shall be provided. When the fumigated cargo transport unit is loaded with dangerous goods in addition to the fumigant, the transport document relevant to these goods shall also be provided.

3.2.5 Training

3.2.5.1 Persons engaged in the handling of fumigated cargo transport units should be trained commensurate with their responsibilities.

3.3 Ship-side operations

3.3.1 Fumigation after loading on board a ship

3.3.1.1 No person should be allowed by the master to fumigate the contents of a cargo transport unit once it has been loaded on board a ship.

3.4 Cargo transport units loaded without ventilation after fumigation (fumigation in transit)

3.4.1 When a cargo transport unit under fumigation is taken on board ship without preliminary ventilation, it shall be transported as FUMIGATED CARGO TRANSPORT UNIT, UN 3359, Class 9 in accordance with the provisions of the IMDG Code. The following special precautions apply to ship-side operations:

.1 A fumigated cargo transport unit shall not be allowed on board until a sufficient period has elapsed to attain a reasonable uniform gas concentration throughout the cargo in it. Because of variations due to types and amounts of fumigants and commodities and temperature levels, the period between fumigant application and loading of the fumigated unit on board the ship shall be determined by the competent authority. Twenty-four hours is normally sufficient for this purpose. Before loading the cargo transport unit should be checked for leaks and any leakage sealed.

.2 The master shall be informed prior to loading of fumigated cargo transport units under fumigation. It shall be identified with the warning mark, incorporating the fumigant name and the date and time of fumigation.

.3 The special list/manifest/stowage plan shall identify the fumigated cargo transport units and indicate their stowage location on board. The transport document for fumigated cargo transport units shall indicate the date of fumigation and the type and amount of fumigant used.

.4 Stowage category B has been assigned to UN 3359, however, on deck stowage is preferred. In addition it shall be stowed clear of living quarters and should be 6 m away from vent intakes.

.5 If stowed under deck, the cargo space should be equipped with mechanical ventilation sufficient to prevent the build-up of fumigant concentrations above the toxicity levels (threshold limits) set out by competent Authorities. The threshold limit for occupational exposure to the fumigant can be found on the Safety Data Sheet if available. The ventilation rate of the mechanical ventilation system should be at least two air changes per hour, based on the empty cargo space.

.6 If stowed under deck, equipment suitable for detecting the fumigant gas or gases used shall be carried on the ship, with instructions for its use.

3.4.2 Before a fumigated cargo transport unit is loaded to a ship under deck, special precautions are necessary. This should include the following:

.1 at least an officer and one other are to receive appropriate training and will be designated as the trained representatives of the master. The master, through his representative, is responsible for ensuring safe conditions in the occupied spaces of the ship; and

.2 the trained representatives should brief the crew before the fumigated cargo transport unit is loaded.

3.4.3 Most fumigant gases are heavier than air so care should be taken in the holds particularly when working on the tank tops.

3.4.4 The trained representatives of the master should be provided, and be familiar, with:

.1 the information in the relevant Safety Data Sheet (SDS), if available; and

.2 the recommendations of the fumigant manufacturer concerning methods of detection of the fumigant in air, its behaviour and hazards properties, symptoms of poisoning, relevant first aid and special medical treatment and emergency procedures.

3.4.5 The ship should carry:

.1 appropriate gas-detection equipment for the fumigant concerned, together with instructions for its use when the fumigated cargo transport unit is stowed under deck;

.2 instructions on disposal of residual fumigant material; and

.3 emergency response information regarding UN 3359 such as a copy of the latest version of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG).

In addition, the ship should carry at least four sets of appropriate respiratory protective equipment; and when the fumigated cargo transport unit is stowed on deck, appropriate gas-detection equipment for the fumigant concerned, together with instructions for its use.

3.4.6 Prior to the arrival of the ship, generally not less than 24 h in advance, the master should inform the appropriate authorities of the country of destination and ports of call that fumigation in transit is being carried out. The information should include the type of fumigant used, the date of fumigation and cargo spaces carrying fumigated cargo transport units.

4 FUMIGANTS USED

There are a number of chemicals that are used as fumigants such as Phosphine and Methyl bromide.

4.1 Phosphine

4.1.1 This process requires a long period of time to work completely. This can be applied with little technical training as it is supplied in sachets, tablets or pressed plates containing Magnesium Phosphide or Aluminium Phosphide. These generate Phosphine gas when exposed to the moisture in the air. The gas has a slight "fishy garlic" smell and breaks down into a powdery grey residue.

4.1.2 The rate of generation of Phosphine depends on the temperature, the airborne moisture and the extent to which the generating material is exposed to the air.

4.1.3 Symptoms of poisoning by inhalation of Phosphine include nausea, vomiting, headache, feeling weak, fainting, pain in chest, cough, chest tightness and difficulty breathing. Pulmonary oedema (the presence of excess fluid in the lungs usually due to heart failure) can follow, usually within 24 h, but sometimes this is delayed for some days.

4.2 Methyl bromide

4.2.1 Fumigation with Methyl bromide is a relatively rapid process that can normally be completed in less than 48 h.

4.2.2 Symptoms of poisoning by inhalation of Methyl bromide include headaches, dizziness, and eye irritation, coughing, nausea, abdominal discomfort, and numbness of feet. Higher exposure will bring about unconsciousness to central nervous system, convulsions, and loss of vision, balance and hearing.

4.2.3 Methyl bromide is supplied as a gas. So, during application, expertise is required to carry out the operation.

5 HAZARDS TO PERSONNEL

5.1 If for any reason, the ship's crew or other personnel have to open a fumigated cargo transport unit or a fumigated cargo transport unit which has been ventilated they should take proper precautions.

5.2 There are no obvious signs when Methyl bromide has been used as a fumigant (e.g., by sight or smell). The cargo transport unit should be left open as long as possible and then checked with the equipment available and should be declared gas free before entry is allowed. In the case of an emergency, entry may be allowed, with full confined space precautions, if there is any gas found to be present.

5.3 If the cargo transport unit is fumigated with Phosphine there are normally visual signs inside the cargo transport unit of the fumigant in the form of sachets, tablets, pressed plates or powder. The state of the packaging depends on the time these have been exposed and the atmosphere that they have been exposed in. It is also possible that the fumigants have moved between cargo items and may not be immediately visible.

5.4 As moisture is required for the reaction to take place, when a cargo transport unit is opened at sea the level of moisture in the air may restart the reaction.

5.5 After the Magnesium or Aluminium Phosphide reacts with moisture to generate Phosphine, a residue of magnesium or aluminium hydroxide remains. This is a light powdery grey substance like ash. Hopefully, this has been retained in some kind of packaging so that it can be removed safely. If, however, there is a residue over the cargo, the crew must avoid breathing in this residue or getting it into their eyes or mouth. If not, they are still at risk of being poisoned by the residue, which may still be able to generate some Phosphine.

5.6 It should be noted that there are certain commodities (e.g., edible nuts) where a small amount of fumigant is put in cotton wool and placed inside each bag. These items are then dangerous because their handling brings the fumigant close to the face.

5.7 Personnel should be made aware that not every fumigated cargo transport unit is declared and, hence, not marked as such. There are indicators for fumigated cargo transport units like tapes on vents or the door joints, a possible "fishy garlic" smell of Phosphine and packets or piles of powdery residue inside the cargo transport unit.

6 FUMIGATION DETECTION

6.1 General

6.1.1 The most effective method of protection is to carry out gas tests before the cargo transport unit is opened. As a minimum, it is recommended to test for Phosphine and Methyl bromide as the two most common fumigants used. If gas is found, the cargo transport unit should be put aside for ventilation.

6.2 Stain tube gas test equipment

6.2.1 Glass stain tube equipment is simple in design and use, robust and reliable. A test for Phosphine and Methyl bromide can be carried out by a person standing outside the cargo transport unit using a lance inserted into the cargo transport unit doorway. In practice, air is drawn by small hand-held bellows through a glass tube containing impregnated crystals which react with the gas for which the test is being done. If the air is contaminated by the gas in question, the crystals change colour. The function is not affected by moisture, but care has to be taken to warm the tubes to above 0°C in sub-zero temperatures. Also a reasonable degree of light is required to detect the colour change of the crystals. The tubes should be used in accordance with the manufacturer's instructions. In particular, they shall not be used after their expiry date.

6.3 Electronic (photo-ionisation gas testing equipment)

6.3.1 Gas tests can be carried out that detect the presence of gases and their concentration levels. Similarly, equipment can confirm that there is a safe level of oxygen within the cargo transport unit. At the present time, the technology is such that both the quantification and discrimination are poor. There are frequent false positives due to cross sensitivities and readings are not accurate enough for determining safe exposure levels. Therefore, these instruments are used for preliminary screening.

6.4 Personal monitors

6.4.1 Small electronic personal monitors are available for Phosphine, but not for Methyl bromide. Phosphine monitors can be placed inside the cargo transport unit while unloaders are working, or worn by individuals on outer garments. The location of an independent monitor is important both to ensure that any fumigant is detected and ensure that the reading is not compromised by ventilation at the door or external contaminants. Monitors issue an audible signal if Phosphine levels reach the pre-set level and are useful as warning devices. However, they should not be used for the initial fumigation detection and measurement process. Also, electronic monitors have the disadvantage that they can respond to a range of harmless substances giving misleading alarm signals.

6.4.2 Personal monitors are also available to show the level of oxygen within the cargo transport unit. This would indicate a deoxygenated atmosphere but would not necessarily indicate that the atmosphere is free from fumigant.

APPENDIX

Ensure suitability of cargo transport unit for fumigation operations and minimize escape of fumigants

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Fumigate Cargo Transport Unit

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Has the CTU been completely ventilated?

Yes → Ventilated cargo transport unit Subject only to the fumigation warning mark with the date of ventilation

No ↓

Cargo transport units loaded without ventilation after fumigation (fumigation in transit)

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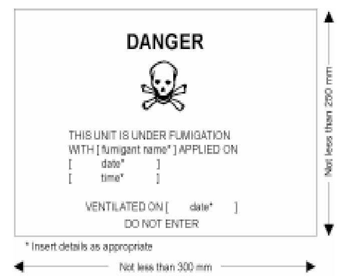
Mark and Document



- The transport document shall specify UN 3359, the proper shipping name (fumigated cargo transport unit), the class (9), the date and time and the type and amount of fumigant used
- to be declared on the special list/manifest/stowage plan

↓

In the absence of the fumigation warning mark as described above, indications for both declared and non-declared fumigated cargo transport units.

- Taped doors/vents
- Packets/piles of powdery residue
- Odour
- Nature, origin and destination of cargo
- Other warning signs

↓

When opening cargo transport units

- Risk assess whether safe to enter the cargo transport unit
- Awareness/marking of residual hazard
- Importance of proper ventilation (venting can take many hours)
- Front to back unloading of cargo transport units
- Avoid "tunnelling" into cargo transport units to retrieve packages
- Remove any marking when the cargo transport unit is fully unloaded and cleaned

ANNEX 9

DRAFT MSC CIRCULAR

RECOMMENDATIONS ON THE SAFE USE OF PESTICIDES IN SHIPS

1 The Maritime Safety Committee, at its sixty-second session (24 to 28 May 1993), approved the Recommendations on the safe use of pesticides in ships (MSC/Circ.612), proposed by the Sub-Committee on Containers and Cargoes at its thirty-second session.

2 The Maritime Safety Committee, at its [eighty-seventh session (12 to 21 May 2010)], approved the revised Recommendations on the safe use of pesticides in ships in pursuance of the requirement of SOLAS regulation VI/4, proposed by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers at its fourteenth session, as set out in the annex to the present circular.

3 Member Governments are invited to bring the revised Recommendations to the attention of competent authorities, mariners, fumigators, fumigant and pesticide manufacturers and others concerned.

4 The present circular supersedes MSC/Circ.612, as amended by MSC/Circ.689 and MSC/Circ.746.

ANNEX

**RECOMMENDATIONS ON THE SAFE USE OF PESTICIDES IN SHIPS
(Revised in 1993)**

TABLE OF CONTENTS

1 INTRODUCTION

1.1 These Recommendations have been compiled by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers under the direction of the Maritime Safety Committee of the International Maritime Organization (IMO).

1.2 Insects and rodents on ships are objectionable for various reasons. In addition to aesthetic and nuisance aspects, pests may damage equipment and spread disease and infection, contaminate food in galleys and food stores and cause damage to cargoes that will result in commercial or other losses. Very few pesticides are suitable for use against all kinds of pests that may occur aboard or in different parts of ships. It is therefore necessary to consider the main categories of pesticides individually.

1.2.1 Insects in cargo spaces and cargoes

1.2.1.1 Insect and mite pests of plant and animal products may be carried into the cargo spaces with goods (introduced infestation): they may move from one kind of product to another (cross infestation) and may remain to attack subsequent cargoes (residual infestation). Their control may be required to comply with phytosanitary requirements to prevent spread of pests and for commercial reasons to prevent infestation and contamination of, or damage to cargoes of human and animal food.* In severe cases of infestation of bulk cargoes such as cereals, excessive heating may occur.

1.2.2 Rodents

1.2.2.1 Rodents should be controlled not only because of the damage they may do to cargo or the ship's equipment, but also, as required by the International Health Regulations, to prevent the spread of disease.

1.3 The following sections provide guidance to shipmasters in the use of pesticides** with a view to safety of personnel and to avoidance of excessive residues of toxic agents in human and animal food. They cover pesticides used for control of insect*** and rodent pests in empty and loaded cargo spaces, in crew and passenger accommodation and in food stores. Account has been taken of existing recommendations of the World Health Organization (WHO), the International Labour Organization (ILO), and the Food and Agriculture Organization (FAO) of the United Nations, in regard to pesticide residues and occupational safety.

2 PREVENTION OF INFESTATION

2.1 Maintenance and sanitation

2.1.1 Ship cargo spaces, tank top ceilings and other parts of the ship should be kept in a good state of repair to avoid infestation. Many ports of the world have rules and by-laws dealing specifically with the maintenance of ships intended to carry grain cargoes; for example, boards and ceilings should be completely grain tight.

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* References to human and animal food include both raw and processed material.

** The word "pesticide" as used throughout the text means insecticides, fumigants and rodenticides. Examples of some commonly used pesticides are listed in the annex.

*** The word "insect" as used throughout the text includes mites.

2.1.2 Cleanliness, or good housekeeping, is as important a means of controlling pests on a ship as it is in a home, warehouse, mill or factory. Since insect pests on ships become established and multiply in debris, much can be done to prevent their increase by simple, thorough cleaning. Box beams and stiffeners, for example, become filled with debris during discharge of cargo and unless kept clean can become a source of heavy infestation. It is important to remove thoroughly all cargo residues from deckhead frames and longitudinal deck girders at the time of discharge, preferably when the cargo level is suitable for convenient cleaning. Where available, industrial vacuum cleaners are of value for the cleaning of cargo spaces and fittings.

2.1.3 The material collected during cleaning should be disposed of, or treated, immediately so that the insects cannot escape and spread to other parts of the ship or elsewhere. In port it may be burnt or treated with a pesticide, but in many countries such material may only be landed under phytosanitary supervision. Where destruction ashore is not practicable, the sweepings should be jettisoned well out to sea. If any part of the ship is being fumigated the material may be left exposed the gas.

2.2 Main sites of infestation

2.2.1 Tank top ceiling: If, as often happens, cracks appear between the ceiling boards, food material may be forced down into the underlying space and serve as a focus of infestation for an indefinite period. Insects bred in this space can readily move out to attack food cargoes and establish their progeny in them.

2.2.2 'Tween-deck centre lines, wooden feeders and bins are often left in place for several voyages and because of their construction are frequent sources of infestation. After unloading a grain cargo, burlap and battens covering the narrow spaces between the planks should be removed and discarded before the holds are cleaned or washed down. These coverings should be replaced by new material in preparation for the next cargo.

2.2.3 Transverse beams and longitudinal deck girders which support the decks and hatch openings may have an L-shaped angle-bar construction. Such girders provide ledges where grain may lodge when bulk cargoes are unloaded. The ledges are often in inaccessible places overlooked during cleaning operations.

2.2.4 Insulated bulkheads near engine-rooms: When the hold side of an engine-room bulkhead is insulated with a wooden sheathing, the air space and the cracks between the boards often become filled with grain and other material. Sometimes the air space is filled with insulating material which may become heavily infested and serves as a place for insect breeding. Temporary wooden bulkheads also provide an ideal place for insect breeding, especially under moist conditions, such as when green lumber is used.

2.2.5 Cargo battens: The crevices at the sparring cleats are ideal places for material to lodge and for insects to hide.

2.2.6 Bilges: Insects in accumulations of food material are often found in these spaces.

2.2.7 Electrical conduit casings; Sometimes the sheet-metal covering is damaged by general cargo and when bulk grain is loaded later, the casings may become completely filled. This residual grain has often been found to be heavily infested. Casings that are damaged should be repaired immediately or, where possible, they should be replaced with steel strapping, which can be cleaned more easily.

2.2.8 Other places where material accumulates and where insects breed and hide include:

The area underneath burlap, which is used to cover limber boards and sometimes to cover tank top ceilings.

Boxing around pipes, especially if it is broken.

Corners, where old cereal material is often found.

Crevices at plate landings, frames and chocks.

Wooden coverings of manholes or wells leading to double-bottom tanks or other places.

Cracks in the wooden ceiling protecting the propeller shaft tunnel.

Beneath rusty scale and old paint on the inside of hull plates.

Shifting boards.

Dunnage material, empty bags and used separation cloths.

Inside lockers.

3 CHEMICAL CONTROL OF INSECT INFESTATION

3.1 Methods of chemical disinfestations

3.1.1 Types of pesticides and methods of insect control

3.1.1.1 To avoid insect populations becoming firmly established in cargo spaces and other parts of a ship, it is necessary to use some form of chemical toxicant for control. The materials available may be divided conveniently into two classes: contact insecticides and fumigants. The choice of agent and method of application depend on the type of commodity, the extent and location of the infestation, the importance and habits of the insects found, and the climatic and other conditions. Recommended treatments are altered or modified from time to time in accordance with new developments.

3.1.1.2 The success of chemical treatments does not lie wholly in the pesticidal activity of the agents used. In addition, an appreciation of the requirements and limitations of the different available methods is required. Crew members can carry out small-scale or "spot treatments" if they adhere to the manufacturer's instructions and take care to cover the whole area of infestation. However, extensive or hazardous treatments including fumigation and spraying near human and animal food should be placed in the hands of professional operators, who should inform the master of the identity of the active ingredients used, the hazards involved and the precautions to be taken.

3.1.2 Contact insecticides

3.1.2.1 Space treatments – insecticides may de discharged into the air as fine particles of liquid or solid. There are a number of types of equipment for producing and distributing such particles. This method of treatment kills flying insects and deals with superficial infestation where exposed insects come into contact with the particles, whilst there may be limited residual pesticidal effect on surfaces on which the particles settle.

3.1.2.2 For use in cargo spaces, space sprays and fogs can be produced in several different ways. These include fog generators in which an insecticide in the form of a liquid or coarse spray is vaporized. Such vaporized insecticides may condense into fine particles on reaching cool air. Alternatively, fine particles may be produced mechanically from suitable formulations by dispersing nozzles, venturi systems or centrifugal force. Insecticidal smokes are evolved from generators simply by igniting the material and such generators are a convenient form of application for use by ships' personnel.

3.1.2.3 Tests have shown that these insecticidal smokes and sprays can be very effective against insects moving freely in the open, in spaces such as holds. However, no appreciable penetration or control of insects can be obtained in deep crevices, or between or under deck boards, tank top ceilings and limber boards, places where infestation commonly occurs. Where insects are deep seated, it is usually necessary to use a fumigant.

3.1.2.4 Surface sprays – spraying with a suitable insecticide can also be used to control residual infestation. Within the limitations of the technique this is a convenient way to control insects as it does not require evacuation of spaces not being treated. Various formulations are available:

.1 emulsifiable concentrates and water-dispersible powder concentrates for dilution with water; and

.2 oil concentrates for dilution with a suitable carrier oil and, for small-scale use, ready-to-use formulations, usually in a light oil.

3.1.2.5 Hand-operated or mechanically-operated sprayers may be used according to the size of the job to be done. To reach the heights of some ships' holds, power equipment is required which will develop enough pressure to get the spray material where it is needed. Hand sprayers are rarely adequate; "Knapsack" sprayers which develop enough pressure to reach infested areas may be used. Such surface sprays produce a deposit toxic to insects present at the time and also to those that subsequently crawl over or settle on treated surfaces.

3.1.2.6 As with fogging, a disadvantage of spraying is that the insecticide does not kill insects hidden in inaccessible parts of cargo spaces. Insecticidal sprays applied in oil solutions or water emulsions take some time to dry and may be hazardous to persons moving about the ship. No cargo should be loaded until spray deposits have dried.

3.1.2.7 In addition to methods described above, insecticidal lacquers may be painted on to boundary junctures in accommodation and galley areas in accordance with the manufacturers' instructions, to provide control of pests. Hand sprayers and hand-held aerosols may also be effective in these areas.

3.1.2.8 During the application of contact insecticides by any method all personnel not directly involved should be evacuated from the areas being treated for a period of time not less than that recommended by the manufacturer of the specific pesticide used on the label or package itself.

3.1.3 Fumigants

3.1.3.1 Fumigants are used where contact insecticides will not give control. Fumigants act in a gaseous phase even though they may be applied as solid or liquid formulations from which the gas arises. Effective and safe use requires that the space being treated be rendered gas-tight for the period of exposure, which may vary from a few hours to several days, depending on the fumigant type and concentration used, the pests, the commodities treated and the temperature. Additional information is provided on two of the most widely used fumigants, methyl bromide and phosphine (hydrogen phosphide) in annex (D).

3.1.3.2 Since fumigant gases are poisonous to humans and require special equipment and skills in application, they should only be used by specialists and not by the ship's crew.

3.1.3.3 Evacuation of the space under gas treatment is mandatory and in some cases it will be necessary for the whole ship to be evacuated (see 3.1.4 and annex (D)).

3.1.3.4 A "Fumigator-in-charge" should be designated by the Fumigation Company, Government Agency or appropriate authority. He should be able to provide documentation to the master proving his competence and authorization. The master should be provided with written instructions by the Fumigator-in-charge on the type of fumigant used, the hazards involved, and the precautions to be taken, and in view of the highly toxic nature of all commonly used fumigants these should be followed carefully. Such instructions should be written in a language readily understood by the master or his representative.

3.1.4 Fumigation with aeration (ventilation) in port

3.1.4.1 Fumigation and aeration (ventilation) of spaces on board a ship should always be carried out in port (alongside or at anchorage). Ships should not be permitted to leave port until gas-free certification has been received from the fumigator-in-charge.

3.1.4.2 Prior to the application of fumigants to spaces, the crew should be landed and remain ashore until the ship is certified "gas-free", in writing, by the fumigator-in-charge or other authorized person. During this period a watchman should be posted to prevent unauthorized boarding or entry, and warning signs should be prominently displayed at gangways and at entrances to accommodation.

3.1.4.3 The fumigator-in-charge should be retained throughout the fumigation period and until such time as the ship is declared gas-free.

3.1.4.4 At the end of the fumigation period the fumigator will take the necessary action to ensure that the fumigant is dispersed from the space. If crew members are required to assist in such actions, for example in opening hatches, they should be provided with adequate respiratory protection and adhere strictly to instructions given by the fumigator-in-charge.

3.1.4.5 The fumigator-in-charge should notify the master in writing of any spaces determined to be safe for re-occupancy by essential crew members prior to the aeration of the ship.

3.1.4.6 In such circumstances the fumigator-in-charge should monitor throughout the fumigation and aeration periods, spaces to which personnel have been permitted to return. Should the concentration in any such area exceed the occupational exposure limit values set by the flag State regulations or by the regulations of the port State where the fumigation is carried out, crew members should be evacuated from the area until measurements show re-occupancy to be safe.

3.1.4.7 No unauthorized persons should be allowed on board until all parts of the ship have been determined gas-free, warning signs removed and gas-free certificates issued by the fumigator-in-charge.

3.1.4.8 Gas-free certificates should only be issued when tests show that all residual fumigant has been dispersed from empty cargo spaces and adjacent working spaces and any residual fumigant material has been removed.

3.1.4.9 Entry into a space under fumigation should never take place except in the event of an extreme emergency. If entry is imperative the fumigator-in-charge and at least one other person should enter, each wearing adequate protective equipment including respiratory protection appropriate for the fumigant used and safety harness and lifeline. Each lifeline should be tended by a person outside the space, who should be similarly equipped.

3.2 Disinfestation of empty cargo spaces

3.2.1 An empty cargo space may be treated by any of the methods described, excepting the use of insecticidal lacquers. Care should be taken to avoid contamination and taint to subsequent cargoes. Examples of some commonly used pesticides are listed in the annex. (For precautions see 3.1.4.)

3.3 Disinfestation of food stores, galleys, and crew and passenger accommodation

3.3.1 In general only those insecticides suitable for use in cargo spaces should be used in dry food stores in ships. A wider range of insecticides may be needed for treatments in-galleys and in passenger and crew accommodation, especially against pests such as cockroaches, ants, flies and bed-bugs. Examples of some commonly used pesticides are listed in the annex.

3.4 Disinfestation of cargoes and surrounds

3.4.1 The recommendations applicable to the fumigation of loaded or partially loaded cargo holds are contained in MSC.1/Circ.1264.

3.5 Carriage of fumigated freight containers, barges and other cargo transport units on a ship

3.5.1 The recommendations applicable to the fumigation of cargo transport units are contained in MSC.1/Circ.[1265].

4 CONTROL OF RODENT PESTS

4.1 General

4.1.1 With regard to rodent control, ships are subject to the provisions of the WHO's International Health Regulations.

4.1.2 Rodents may be controlled by fumigation, by the use of a bait incorporating a poison which acts within a few minutes (acute poison), or one which acts over a period (chronic poison), or by trapping.

4.2 Fumigation and baiting

4.2.1 Fumigation against rodents is normally done at dosages and periods of exposure much less than those required for insect control. It follows that an insect fumigation also controls rodents in areas that are treated. However, rodent control often requires fumigation of accommodation and working spaces that may not normally be treated for insect control.

4.2.2 Fumigation against rodents alone should be undertaken in port and ventilation completed in port. The precautions in 3.1.4 should be observed.

4.2.3 Methods involving fumigation or the use of acute poisons should be employed only by qualified personnel of pest control servicing firms or appropriate authorities (e.g., Port Health Authorities). Baits containing acute poisons should be collected and disposed of by such personnel when the treatment is completed. Chronic poisons should be used strictly in accordance with the manufacturer's instructions contained on the label or on the package itself.

4.3 Rodents baits (Chronic poisons permitted for use by ship's personnel)

4.3.1 Careless use may cause injury to ship's personnel.

4.3.2 For rodenticides to be efficient, they should be placed where the rodents are moving. Runways are usually detected by evidence of marking, debris and dirt. The use of rodenticides, however, is no substitute for high standards of hygiene and the rodent proofing of equipment whenever possible.

4.3.2.1 Baits should be protected from accidental consumption by humans or domestic animals and from contact with human and animal food.

4.3.2.2 Where practicable, cereal baits should be replaced within 30 days to avoid providing a source of insect infestation.

4.3.3 A record should be kept of the locations in which baits are set, particular care being taken to search for and remove all baits from cargo spaces prior to the loading of bulk foodstuffs and livestock cargoes.

5 REGULATIONS FOR THE USE OF PESTICIDES

5.1 National and international controls on pesticides usage

5.1.1 In many countries the sale and use of pesticides are regulated by governments to ensure safety in application and prevention of contamination of foodstuffs. Among the factors taken into account in such regulations, are the recommendations made by international organizations such as the FAO and the WHO, especially in regard to maximum limits of pesticide residues in food and foodstuffs.

5.1.2 Examples of some commonly used pesticides are listed in the annex. Pesticides should be used strictly in accordance with the manufacturer's instructions as given on the label or package itself. National regulations and requirements vary from one country to another, therefore particular pesticides which may be used for treatment of cargo spaces and accommodation in ships may be limited by the regulations and requirements of:

.1 the country where the cargo is loaded or treated:

.2 the country of destination of the cargo, especially in regard to pesticide residues in foodstuffs; and

.3 the country of registration of the ship.

5.1.3 Ships' masters should ensure that they have the necessary knowledge of the above regulations and requirements.

6 SAFETY PRECAUTIONS – GENERAL

6.1 Pesticide materials

6.1.1 Pesticides are often at least as poisonous to humans as to the pests against which they are used. The instructions given on the label or package itself, particularly those relating to safety and disposal of residual material, should be strictly followed.

6.1.2 Pesticides should be stored in strict compliance with national regulations and requirements or the manufacturers' instructions.

6.1.3 Smoking, eating or drinking while using pesticides should always be avoided.

6.1.4 Empty pesticide receptacles and packaging should never be re-used.

6.1.5 Hands should always be washed after applying pesticides.

6.2 Space and surface spraying (see also 3.1.2 above)

6.2.1 When spraying is being carried out by professional operators they are responsible for taking the necessary safety precautions. If operations are carried out by the crew, the master should ensure that the following safeguards are observed, both in the preparation and the application of the pesticides:

.1 wear protective clothing, gloves, respirators and eye protection appropriate to the pesticides being used;

.2 do not remove clothes, gloves, respirators or eye protection whilst applying pesticides, even under hot conditions; and

.3 avoid excessive application and run-off on surfaces and avoid contamination of foodstuff.

6.2.2 If clothing becomes contaminated:

.1 stop work immediately and leave area;

.2 remove clothing and footwear;

.3 take a shower and wash skin thoroughly;

.4 wash clothing and footwear, and wash skin again; and

.5 seek medical advice.

6.2.3 After work:

.1 remove and wash clothing, footwear and other equipment; and

.2 take a shower using plenty of soap.

6.3 Fumigation

6.3.1 Ships' personnel should not handle fumigants and such operations should be carried out only by qualified operators. Personnel allowed to remain in the vicinity of a fumigation operation for a particular purpose should follow the instructions of the Fumigator-in-charge implicitly.

6.3.2 Aeration of treated spaces on board a ship should be completed and a gas-free certificate should be issued as described in 3.1.4 before personnel are permitted to enter.

6.4 Exposure to pesticides resulting in illness

6.4.1 In the case of exposure to pesticides and subsequent illness, medical advice should be sought immediately. Information on poisoning by specific compounds may be found in the IMO Medical First Aid Guide for use in Accidents Involving Dangerous Goods (MFAG), or on the package (manufacturer's instructions and safety precautions on the label or the package itself).

Annex

PESTICIDES SUITABLE FOR SHIPBOARD USE

The materials listed should be used strictly in accordance with the manufacturers' instructions and safety precautions, given on the label or package itself, especially in respect of flammability and with regard to any further limitations applied by the law of the country of loading, destination or flag of the ship, contracts relating to the cargo, or the shipowner's instructions.

Materials may be used by ship's personnel unless the contrary is indicated. A space-application insecticide may be used in conjunction with a residual insecticide.

It should be especially noted that some materials listed may taint sensitive commodities, e.g., coffee and cocoa, and special care should be taken when stowing these commodities in order to prevent this. The reason for naming purified grades in the list below is to minimize tainting.

A. Contact insecticides in a cargo space:

A1. Fast-acting insecticides for space application, e.g., against flying insects:

Pyrethrins (with or without synergist)

Bioresmethrin

Dichlorvos

A2. Slower-acting residual insecticides for surface application:

Malathion (premium grade)

Bromophos

Carbaryl

Fenitrothion

Chlorpyriphos-methyl

Pirimiphos-methyl

B. Contact insecticides and baits in accommodation:

B1. Fast-acting insecticides for space application, e.g., against flying insects:

Pyrethrins (with or without synergist)

Bioresmethrin

Dichlorvos

B2. Slower-acting residual insecticides:

Malathion (premium grade)

Diazinon

Fenitrothion

Propoxur

Bendiocarb

Permethrin

B3. Insecticides for use against particular pests and as an additional treatment:

Diazinon, as an aerosol spray or lacquer against ants, cockroaches and flies

Dieldrin and Aldrin, in lacquers for control of ants and cockroaches

Methoprene bait, for control of Pharaoh's ants

Chlorpyriphos-ethyl, as a bait and as a lacquer

C. Rodenticides:

C1. Chronic poisons in baits:

Calciferol

Any Anticoagulant in the following two classes:

Hydroxycoumarins (e.g., Warfarin, Fumarin, Coumatetralyl, Difenacoum, Brodifacoum)

Indandiones (e.g., Pival, Diphacinone, Chlorophacinone)

C2. Acute poisons in baits or liquids:

TO BE USED ONLY IN PORT AND BY QUALIFIED OPERATORS

Barium fluoroacetate

Fluoroacetamide

Sodium fluoroacetate

Zinc phosphide

D. FUMIGANTS

TO BE APPLIED ONLY BY QUALIFIED OPERATORS

Additional information on methyl bromide and phosphine (hydrogen phosphide) to be read in conjunction with 3.1.3.

Methyl bromide

Methyl bromide is used in situations where a rapid treatment of spaces or commodities is required. Fumigation with methyl bromide should be **permitted only when the ship is in the confines of a port** (either at anchor or alongside) and to disinfest the spaces after the crew members have disembarked (see 3.1.3.3). Prior to re-embarkation of the crew, ventilation of the treated spaces should be completed and a gas-free certificate should be issued as described in 3.1.4 before personnel are permitted to enter.

Phosphine (Hydrogen phosphide)

A variety of phosphine-generating formulations are used for at-berth fumigations and also for in-ship in-transit fumigations. Application methods vary widely and include surface only treatment, probing, perforated tubing laid at the bottom of spaces, recirculation systems and gas-injection systems or their combinations. Ventilation of the treated spaces should be completed and a gas-free certificate should be issued as described in 3.1.4 before personnel are permitted to enter. **All safety recommendations related to the fumigation of cargo in cargo holds under in-ship in-transit fumigation are laid down in MSC.1/Circ.1264.**

Dl. Fumigants against insects in empty cargo spaces and against rodents anywhere aboard ship:

Carbon dioxide

Nitrogen

Methyl bromide and carbon dioxide mixture

Methyl bromide

Hydrogen cyanide

Phosphine (Hydrogen phosphide)

D2. Fumigants against insects in loaded or partially loaded cargo spaces and cargo transport units:

Refer to MSC.1/Circ.1264 and MSC.1/Circ.[1265]

CARE IS NEEDED IN SELECTING TYPES AND AMOUNTS OF FUMIGANTS FOR TREATMENT OF PARTICULAR COMMODITIES

Carbon dioxide

Nitrogen

Methyl bromide and carbon dioxide mixture

Methyl bromide

Phosphine (Hydrogen phosphide)

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Ref. T2-OSS/6.04 MSC.1/Circ.1364
24 May 2010

REVISED INTERNATIONAL SAFETYNET MANUAL

1 The Maritime Safety Committee (MSC), at its eighty-seventh session (12 to 21 May 2010), noted and approved the revised International SafetyNET Manual, as prepared by IHO, WMO and IMSO and agreed by the Sub-Committee on Radiocommunications and Search and Rescue (COMSAR) at its fourteenth session (8 to 12 March 2010).

2 This circular supersedes MSC/Circ.1064 and replaces the existing text of the International SafetyNET Manual.

3 The Committee decided that the amendments will come into force on 1 January 2012.

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ANNEX

IMO International SafetyNET Manual

PREFACE

SOLAS regulation IV/12.2 states that "Every ship, while at sea, shall maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the ship is navigating".

At the request of the IMO Sub-Committee on Radiocommunications, the International SafetyNET Manual was first produced in 1994. The second edition was published in 2003 containing amendments endorsed by the Maritime Safety Committee at its seventy-sixth session in December 2002 by MSC/Circ.1064.

At its seventh meeting in September 2005, the IHO's Commission on the Promulgation of Radio Navigational Warnings (CPRNW[1]) established a Working Group to review all World-Wide Navigational Warning Service (WWNWS) documentation. The Working Group included representation from the WMO and prepared at first, revisions to IMO resolutions A.705(17), "Promulgation of Maritime Safety Information" and A.706(17), "World-Wide Navigational Warning Service". The proposed revisions of the resolutions were circulated to IHO Member States under IHB CL 104/2007, endorsed by COMSAR at its twelfth session in April 2008 and subsequently approved by the Maritime Safety Committee at its eighty-fifth session in November/December 2008 by MSC.1/Circ.1287 and MSC.1/Circ.1288 respectively.

The IHO CPRNW[1] Working Group then prepared the revised Joint IMO/IHO/WMO Manual on Maritime Safety Information incorporating the revised information from resolutions A.705(17), as amended and A.706(17), as amended. The revised text of the Joint IMO/IHO/WMO Manual on Maritime Safety Information was circulated to IHO Member States under cover of IHB CL 70/2008, endorsed by COMSAR at its thirteenth session in January 2009 and subsequently approved by the Maritime Safety Committee at its eighty-sixth session in May/June 2009 by MSC.1/Circ.1310.

Continuing with the holistic approach of reviewing all the MSI documents from the top-down, the IHO WWNWS Working Group prepared the third revision of the International SafetyNET Manual. The revised text of the International SafetyNET Manual was circulated to IHO Member States under cover of IHB CL 68/2009, endorsed by COMSAR at its fourteenth session in March 2010 and subsequently approved by the Maritime Safety Committee at its eighty-seventh session in May 2010.

[1] CPRNW was renamed the IHO WWNWS Sub Committee (WWNWS) with effect from 1 January 2009.

CONTENTS

1 – GENERAL INFORMATION

SafetyNET is an international automatic direct-printing satellite-based service for the promulgation of navigational and meteorological warnings, meteorological forecasts, Search and Rescue (SAR) information and other urgent safety-related messages – maritime safety information (MSI) – to ships. It has been developed as a safety service of the Inmarsat-C enhanced group call system to provide a simple and automated means of receiving MSI on board ships at sea. The message-selection features of SafetyNET receivers enable mariners to receive safety information broadcasts that are tailored to their particular needs.

SafetyNET fulfils an integral role in the Global Maritime Distress and Safety System (GMDSS) developed by the International Maritime Organization (IMO) and incorporated into the 1988 amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, as a requirement for ships to which the Convention applies.

This Manual describes the structure and operation of the International SafetyNET Service. It is intended primarily for national Administrations and registered information providers, but may also be useful to the mariner who requires more operational information than is found in manufacturers' equipment manuals.

2 – SAFETYNET SERVICE

2.1 Introduction

2.1.1 SafetyNET provides shipping with navigational and meteorological warnings, meteorological forecasts, shore-to-ship distress alerts, SAR information and other urgent information in accordance with the requirements of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended. It is suitable for use in all sizes and types of ships. Figure 1 illustrates the way the service is structured.

2.1.2 SafetyNET is a service of Inmarsat's Enhanced Group Call (EGC) system and was specifically designed for promulgation of MSI as a part of the GMDSS. The EGC system (technically a part of the Inmarsat-C system) provides an automatic method of broadcasting messages to both fixed and variable geographical areas. It is designed with the capability to provide services within the coverage areas of geostationary satellites, know as satellite ocean regions (approximately between 76° N and 76° S). In addition to providing services to ships operating in sea area A3, it also provides the means of disseminating MSI to coastal warning areas not covered by the International NAVTEX service.

2.1.3 SafetyNET offers the ability to direct a message to a given geographical area. The area may be fixed, as in the case of a NAVAREA/METAREA or coastal warning area; or it may be a user defined area (circular or rectangular). A user defined area is used for messages, such as a local storm warning or a shore-to-ship distress alert, for which it is inappropriate to alert ships in an entire satellite ocean region or NAVAREA/METAREA. The general EGC system capabilities are shown in Figure 2.

2.1.4 SafetyNET messages are submitted by registered information providers for broadcast to the appropriate satellite ocean region(s) via an Inmarsat-C Land Earth Station (LES). Messages are broadcast according to their priority, i.e. distress, urgency or safety. Aboard ship, messages are received by type-approved Inmarsat-C or Mini-C mobile terminals with EGC SafetyNET capability.

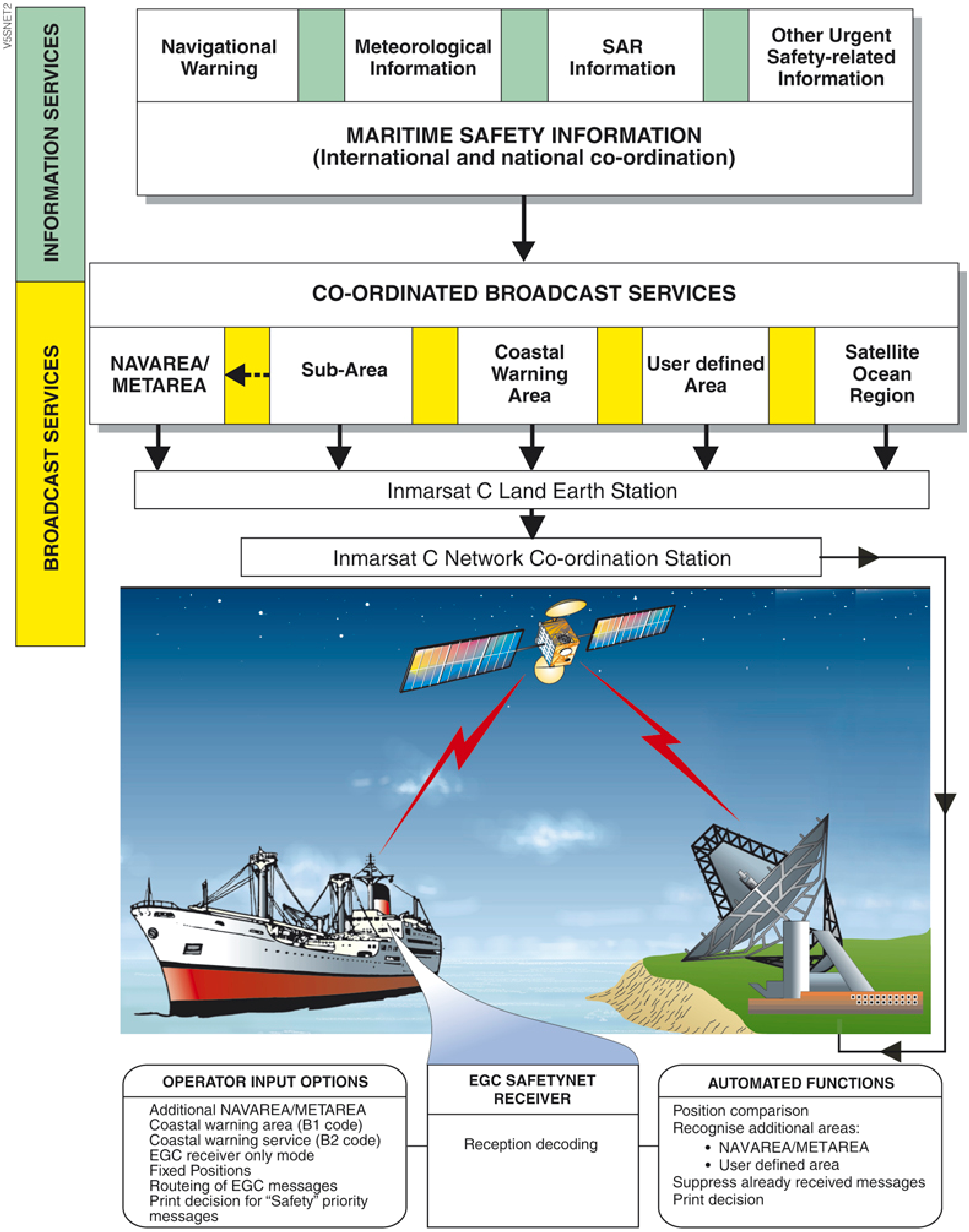

Figure 1 – The International SafetyNET Service system

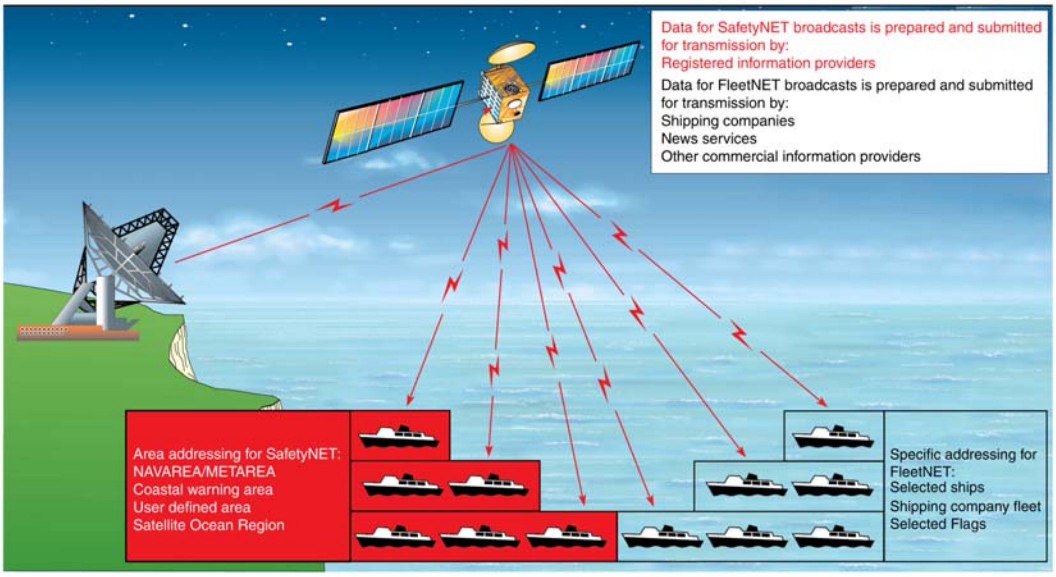

Figure 2 – Basic concept of the Inmarsat Enhanced Group Call system

2.2 Definitions

2.2.1 For the purposes of this manual, the following definitions apply:

.1 *Coastal warning* means a navigational warning promulgated as part of a numbered series by a National co-ordinator. Broadcast shall be made by the International NAVTEX service to defined NAVTEX service areas and/or by the International SafetyNET service to coastal warning areas. (In addition, Administrations may issue coastal warnings by other means.)

.2 *Coastal warning area* means a unique and precisely defined sea area within a NAVAREA/METAREA or Sub-Area established by a coastal state for the purpose of co-ordinating the broadcast of coastal maritime safety information through the SafetyNET service.

.3 *Enhanced Group Call (EGC)* means the system for broadcasting messages via the mobile satellite communications system operated by Inmarsat Global Limited. EGC is a part of the Inmarsat-C system and supports two services: SafetyNET and FleetNET.

.4 *FleetNET* means the commercial service for the broadcasting and automatic reception of fleet management and general public information by means of direct printing through Inmarsat's EGC system. Some receivers for FleetNET may not be able to receive SafetyNET.

.5 *Global Maritime Distress and Safety System (GMDSS)* means the global communications service based upon automated systems, both satellite and terrestrial, to provide distress alerting and promulgation of Maritime Safety Information for mariners.

.6 *HF NBDP* means High Frequency narrow-band direct-printing, using radio telegraphy as defined in Recommendation ITU-R M.688.

.7 *In-force bulletin* means a list of serial numbers of those NAVAREA, Sub-Area or coastal warnings in force issued and broadcast by the NAVAREA co-ordinator, Sub-Area co-ordinator or National co-ordinator during at least the previous six weeks.

.8 *Inmarsat B* means the digital satellite communications system for transmission of voice, telex, facsimile or data using directional antennas. *(Note: Inmarsat B will be discontinued from 31 December 2014)*

.9 *Inmarsat-C* means the digital satellite communications system for store-and-forward text or data messaging using mobile terminals with omni-directional antennas. Inmarsat-C is the only system that allows ships to meet the majority of the satellite communication requirements of the GMDSS including distress alerting, reception of maritime safety information and general communications.

.10 *Inmarsat Mini-C* means smaller terminals, based on the same technical requirements as Inmarsat-C terminals. Some models are approved as GMDSS compliant terminals.

.11 *Inmarsat Fleet* means the digital satellite communication system that provides voice and flexible data communication services, e-mail and secure internet access for maritime users, comprising a family of Fleet F77, F55 and F33 mobile terminals. The Inmarsat Fleet F77 system provides voice distress and safety functionality and meets the requirements of IMO resolution A.1001(25).

.12 *Inmarsat FleetBroadband* means the communication service that provides voice and high-speed data services, simultaneously, through compact terminals for maritime users.

.13 *International NAVTEX service* means the co-ordinated broadcast and automatic reception on 518 kHz of maritime safety information by means of narrow-band direct-printing telegraphy using the English language[2].

.14 *International SafetyNET service* means the co-ordinated broadcasting and automated reception of maritime safety information via the Inmarsat Enhanced Group Call (EGC) system, using the English language, in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

.15 *Land Earth Station (LES)* means a fixed terrestrial station acting as a gateway between terrestrial communication networks and the Inmarsat satellites in the maritime mobile-satellite service. This may also be referred to as a Coast Earth Station (CES).

.16 *Land Earth Station Operator (LESO)* means an Inmarsat service provider which owns and operates the LES.

.17 *Local warning* means a navigational warning which covers inshore waters, often within the limits of jurisdiction of a harbour or port authority.

[2] As set out in the IMO NAVTEX Manual.

.18 *Maritime safety information (MSI)*[3] means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships.

.19 *Maritime safety information service* means the internationally and nationally co-ordinated network of broadcasts containing information which is necessary for safe navigation.

.20 *METAREA* means a geographical sea area[4] established for the purpose of co-ordinating the broadcast of marine meteorological information. The term METAREA followed by a roman numeral may be used to identify a particular sea area. The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States **(See Figure 4)**.

.21 *METAREA issuing service* means the National Meteorological Service which has accepted responsibility for ensuring that meteorological forecasts and warnings are disseminated through the Inmarsat SafetyNET service to the designated METAREA or other area.

.22 *Meteorological information* means the marine meteorological warning and forecast information in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

.23 *Mobile Earth Station (MES)* means a mobile user terminal in the Inmarsat maritime mobile-satellite service. This may also be referred to as Ship Earth Station (SES).

.24 *National co-ordinator* means the national authority charged with collating and issuing coastal warnings within a national area of responsibility.

.25 *National NAVTEX* service means the broadcast and automatic reception of maritime safety information by means of narrow-band direct-printing telegraphy using frequencies other than 518 kHz and languages as decided by the Administration concerned.

.26 *National SafetyNET service* means the broadcasting and automated reception of maritime safety information via the Inmarsat EGC system, using languages as decided by the Administration concerned.

.27 *NAVAREA* means a geographical sea area[4] established for the purpose of co-ordinating the broadcast of navigational warnings. The term NAVAREA followed by a roman numeral may be used to identify a particular sea area. The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States **(See Figure 3)**.

.28 *NAVAREA co-ordinator* means the authority charged with co-ordinating, collating and issuing NAVAREA warnings for a designated NAVAREA.

.29 *NAVAREA warning* means a navigational warning or in-force bulletin promulgated as part of a numbered series by a NAVAREA co-ordinator.

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[3] as defined in Regulation IV/2 of the 1974 SOLAS Convention, as amended.

[4] which may include inland seas, lakes and waterways navigable by sea-going ships.

.30 *Navigational warning* means a message containing urgent information relevant to safe navigation broadcast to ships in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

.31 *NAVTEX* means the system for the broadcast and automatic reception of maritime safety information by means of narrow-band direct-printing telegraphy.

.32 *NAVTEX service area* means a unique and precisely defined sea area for which maritime safety information is provided from a particular NAVTEX transmitter.

.33 *NAVTEX co-ordinator* means the authority charged with operating and managing one or more NAVTEX stations broadcasting maritime safety information as part of the International NAVTEX service.

.34 *Network Co-ordination Station (NCS)* means a fixed land station in the Inmarsat satellite communications system which controls channel assignments and provides the network management functions for each of the four satellite ocean regions. NCSs also transmit EGC messages on the NCS common channel.

.35 *Other urgent safety-related information* means maritime safety information broadcast to ships that is not defined as a navigational warning, meteorological information or SAR information. This may include, but is not limited to, significant malfunctions or changes to maritime communications systems, and new or amended mandatory ship reporting systems or maritime regulations affecting ships at sea.

.36 *Registered information provider* means a maritime safety information provider (MSI provider), authorized in accordance with Annex 2 of the International SafetyNET Manual, which has an agreement with one or more LES(s) for providing SafetyNET services.

.37 *Rescue Co-ordination Centre (RCC)* means a unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.

.38 *SafetyNET* means the international service for the broadcasting and automatic reception of maritime safety information via the Inmarsat EGC system. SafetyNET receiving capability is part of the mandatory equipment which is required to be carried by certain ships in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

.39 *SAR information* means distress alert relays and other urgent search and rescue information broadcast to ships.

.40 *Satellite Ocean Region* means the area on the earth's surface within which a mobile or fixed antenna can obtain line-of-sight communications with one of the four primary Inmarsat geostationary satellites. This area may also be referred to as the "footprint":

Atlantic Ocean Region – East (AOR-E)
Atlantic Ocean Region – West (AOR-W)
Indian Ocean Region (IOR)
Pacific Ocean Region (POR)

.41 *Sea Area A1* means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC[5] alerting is available, as may be defined by a Contracting Government.

.42 *Sea Area A2* means an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available, as may be defined by a Contracting Government.

.43 *Sea Area A3* means an area, excluding sea areas A1 and A2, within the coverage of an Inmarsat geostationary satellite in which continuous alerting is available.

.44 *Sea Area A4* means an area outside sea areas A1, A2 and A3.

.45 *Sub-Area* means a sub-division of a NAVAREA/METAREA in which a number of countries have established a co-ordinated system for the promulgation of maritime safety information. The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States.

.46 *Sub-Area co-ordinator* means the authority charged with co-ordinating, collating and issuing Sub-Area warnings for a designated Sub-Area.

.47 *Sub-Area warning* means a navigational warning promulgated as part of a numbered series by a Sub-Area co-ordinator. Broadcast shall be made by the International NAVTEX service to defined NAVTEX service areas or by the International SafetyNET service (through the appropriate NAVAREA co-ordinator.)

.48 *User defined area* means a temporary geographic area, either circular or rectangular, to which maritime safety information is addressed.

.49 *UTC* means Co-ordinated Universal Time which is equivalent to GMT (or ZULU) as the international time standard

.50 *World-Wide Navigational Warning Service (WWNWS)*[6] means the internationally and nationally co-ordinated service for the promulgation of navigational warnings**.**

.51 In the operating procedures *co-ordination* means that the allocation of the time for data broadcast is centralized, the format and criteria of data transmissions are compliant as described in the Joint IMO/IHO/WMO Manual on Maritime Safety Information and that all services are managed as set out in IMO resolutions A.705(17), as amended and A.(706)17, as amended.

[5] Digital selective calling (DSC) means a technique using digital codes which enables a radio station to establish contact with and transfer information to another station or group of stations and complying with the relevant recommendations of the International Radio Consultative Committee ((CCIR) – "Radiocommunications Bureau of the International Telecommunication Union (ITU)" from 1 March 1993).

[6] as set out in resolution A.706(17), as amended.

2.2.2 NAVAREAS with Inmarsat satellite ocean region coverage

LIMITS OF NAVAREAS

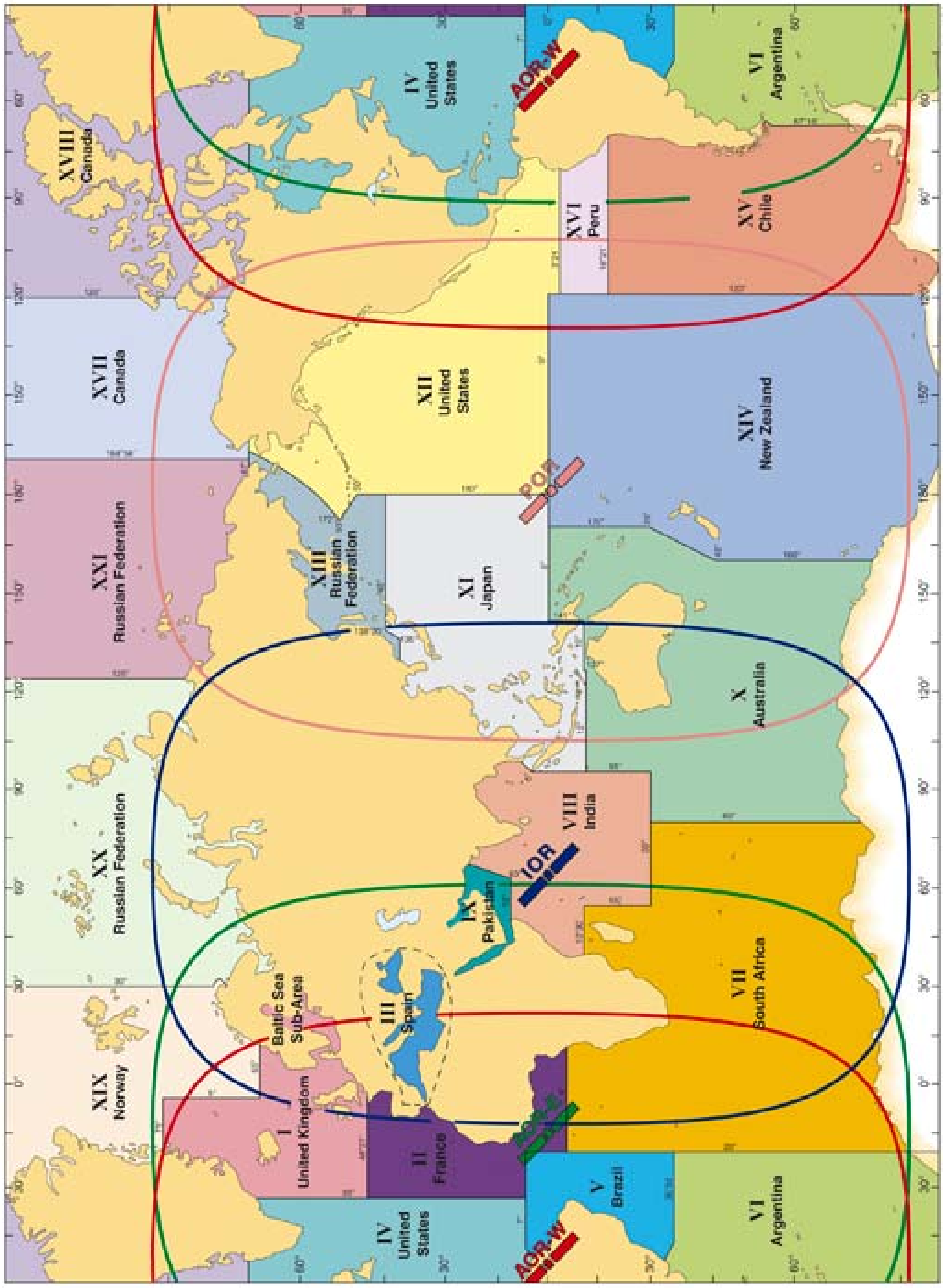


Figure 3

NAVAREAS for coordinating and promulgating radio navigational warnings under the World-Wide Navigational Warning Service, including Inmarsat satellite footprints

The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States

2.2.3 METAREAS with Inmarsat satellite ocean region coverage

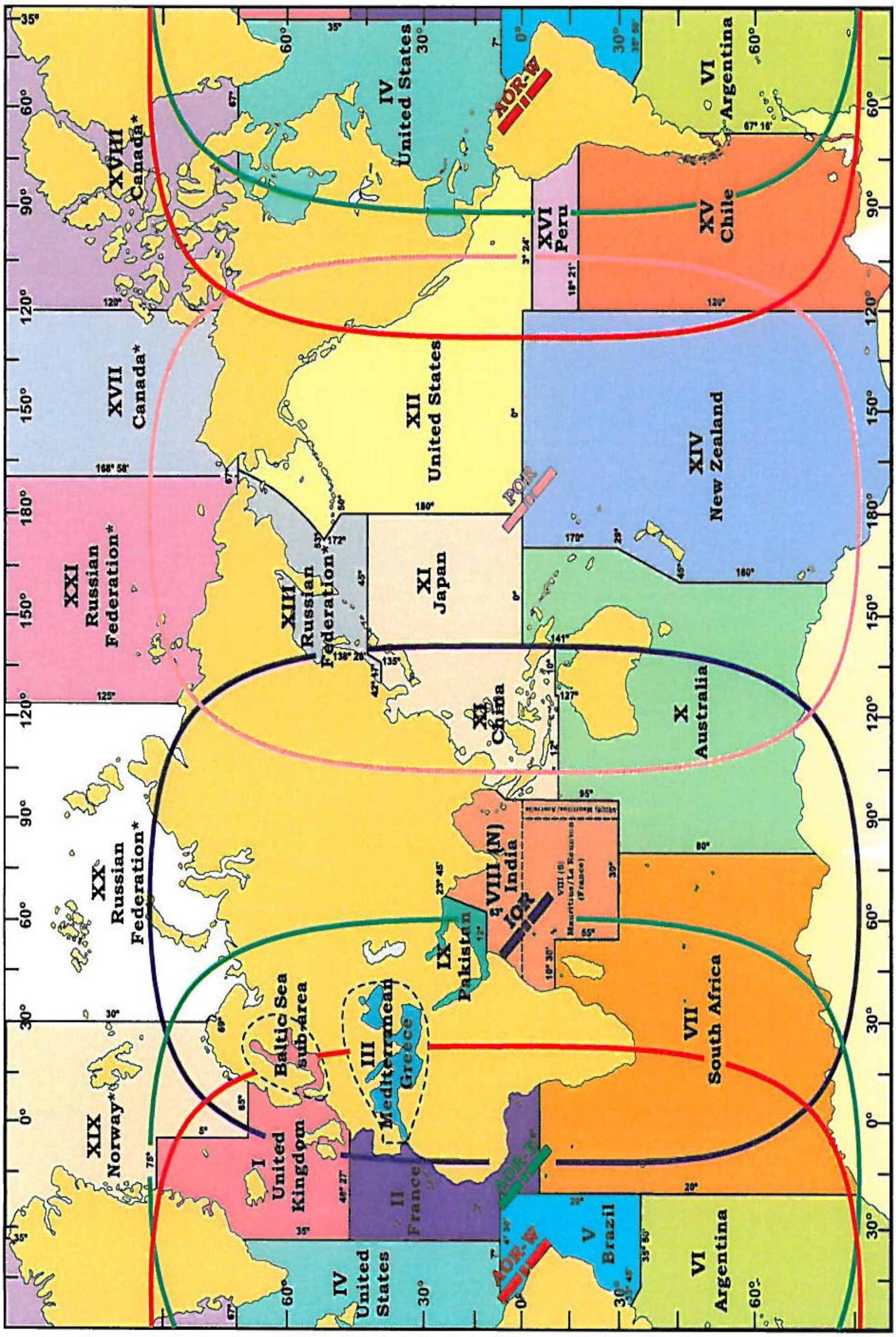


Figure 4
METAREAS for coordinating and promulgating meteorological warnings and forecasts including Inmarsat satellite footprints

The delimitation of such areas is not related to and shall not prejudice the delimitation of any boundaries between States.

3 – GENERAL FEATURES OF THE EGC SYSTEM

3.1 The Inmarsat-C EGC system supports two different services:

.1 SafetyNET – for promulgation of MSI; and

.2 FleetNET – for transmission of fleet management, general public information and other information to fleets or groups of ships. **The FleetNET service is not part of the GMDSS.**

3.2 All navigable waters of the world between 76° N and 76° S are covered by satellites in the Inmarsat system. Each satellite transmits EGC messages on a designated channel; this channel is optimized to enable the signal to be received by Inmarsat-C or Mini-C terminals with EGC SafetyNET capability. Reception of EGC messages is normally not affected by the position of the ship within the satellite ocean region, atmospheric conditions or time of day.

3.3 SafetyNET messages are addressed to a geographical area (area calls), where as FleetNET messages are addressed to groups of ships (group calls):

.1 *Area calls* (SafetyNET) can be addressed to a fixed geographical area (NAVAREA/METAREA or coastal warning area) or to a user defined area selected by an MSI provider. Area calls will be received automatically by any SafetyNET receiver within the area. To receive SafetyNET coastal warnings, the EGC receiver must be set up with appropriate B_1 and B_2 codes – where the B_1 Code is the designator of the defined area and the B_2 Code is the subject indicator **(See section 13.4)**.

.2 *Group calls* (FleetNET) will be received automatically by any ship whose EGC receiver acknowledges the unique group identity associated with a particular message.

4 – PLANNING OF NEW SAFETYNET SERVICES

4.1 Authorities wishing to become officially registered information providers of MSI to ships at sea via SafetyNET, should contact the IMO via the International SafetyNET Coordinating Panel at an early stage for advice. The plans of any prospective registered information providers should be co-ordinated with the IMO, IHO and WMO and with other national authorities, before authorization to broadcast via SafetyNET may be granted by the International SafetyNET Panel, in accordance with the procedures set out in Annex 2.

4.2 Once authorized and registered, information providers should contact the LES operator(s) or service provider(s) they desire to use for promulgation of information to their areas of responsibility, in order to determine specific details for addressing messages, accessing the LES, charges and payment for services and any other matters with respect to providing MSI to mariners.

4.3 The International SafetyNET Coordinating Panel, in co-operation with IHO and WMO, undertakes the co-ordination of times for scheduled transmissions.

4.4 Mariners should be informed of the establishment of a SafetyNET service by the inclusion of full details in Notices to Mariners and other national nautical publications and the IMO Master Plan of Shore-Based Facilities for the GMDSS, as amended. In addition, full details of the service should be sent to the International SafetyNET Co-ordinating Panel at the address given in Annex 1.

4.5 Questions concerning promulgation of MSI through the EGC SafetyNET service can be addressed to the International SafetyNET Co-ordinating Panel at the address given in Annex 1.

4.6 Questions concerning the operation of the Inmarsat system should be addressed to Maritime Safety Services, Inmarsat Global Ltd, 99 City Road, London EC1Y 1AX, United Kingdom. E-mail address: maritime_safety@inmarsat.com

5 – CHANGES TO EXISTING SAFETYNET SERVICES

5.1 Registered information providers wishing to change their existing SafetyNET service should follow the same co-ordination procedures as for a new service, in accordance with the procedures set out in Annex 2

5.2 Mariners should be informed of the changes to an existing SafetyNET service by the inclusion of full details in Notices to Mariners and other national nautical publications and the IMO Master Plan of Shore-Based Facilities for the GMDSS, as amended. In addition, full details of the service should be sent to the International SafetyNET Co-ordinating Panel at the address given in Annex 1.

6 – OPERATION OF THE INTERNATIONAL SAFETYNET SERVICE

6.1 Given the size of a satellite ocean region, some form of selectivity in receiving and printing the various messages is required. All ships within the footprint of a selected satellite will receive area calls, however, they will only be displayed and printed by those receivers that recognize both;

> **.1** the fixed geographical area (NAVAREA/METAREA), user defined area as appropriate, and;
>
> **.2** for coastal warnings, the coastal warning area and the subject indicator for the message.

6.2 The message format includes a preamble which enables the EGC receiver to display and print only those MSI messages which relate to its present position, to the intended route, or to the afore mentioned areas as programmed by the operator.

6.3 For coastal warning areas messages, the MSI provider must ensure that the preamble includes the B_1 Code identifier allocated for the particular area, along with the appropriate B_2 Code subject indicator **(See section 13.4)**. The EGC receiver can be set to reject messages concerning certain optional subjects which may not be required by the ship (e.g. LORAN messages may be rejected in a ship which is not fitted with a LORAN receiver). Receivers also use the B_2 Code subject indicator, to identify coastal warnings which, because of their importance, may NOT be rejected.

6.4 Reception of certain types of messages, such as shore-to-ship distress alerts, SAR information, meteorological warnings and forecasts and navigational warnings, addressed to a geographical area within which the EGC receiver is located, is mandatory and cannot be suppressed by ships in the affected area. These messages are identified by the C_2 service codes: 00, 04, 14, 24, 31, 34 and 44 **(See Annex 4**).

6.5 When a message has been received error-free, a record is made of the message identification (the unique sequence number**,** the LES identifier and the service code) associated with that message. The unique sequence number is used to suppress the printing of repeated transmissions of the same message.

6.6 An EGC receiver is capable of storing at least 255 message identifications. These message identifications are stored with an indication of the number of hours that have elapsed since the last receipt of the message. Subsequent reception of the same message identification will reset this timer. After between 60 and 72 hours, message identifications may be automatically erased. If the number of received message identifications exceeds the capacity of memory allocated, the oldest message identification will be erased.

6.7 SafetyNET messages can be addressed to user defined areas, which may be circular or rectangular in shape. A circular area is described by latitude and longitude of the centre in degrees and radius of the circle in nautical miles. A rectangular area is described by latitude and longitude of the southwest corner in degrees and extension in degrees to the North and East of the rectangle.

6.8 In the case of a ship in distress, it is normal to create a circular user defined area (C_2 service code 14), defined by the position of the casualty and a radius around the casualty to alert ships that may be able to render assistance **(See Figure 5**). If no response is received from any ship at the first call, the area can be expanded in steps until an acknowledgement by one or more ships is received. In cases where the position of the distress is unknown, a shore to ship distress alert can be transmitted to all ships (C_2 service code 00), in a given satellite ocean region. SAR co-ordination messages shall only be addressed to circular (C_2 service code 14) or to rectangular (C_2 service code 34) user defined areas **(See Figure 6)**.

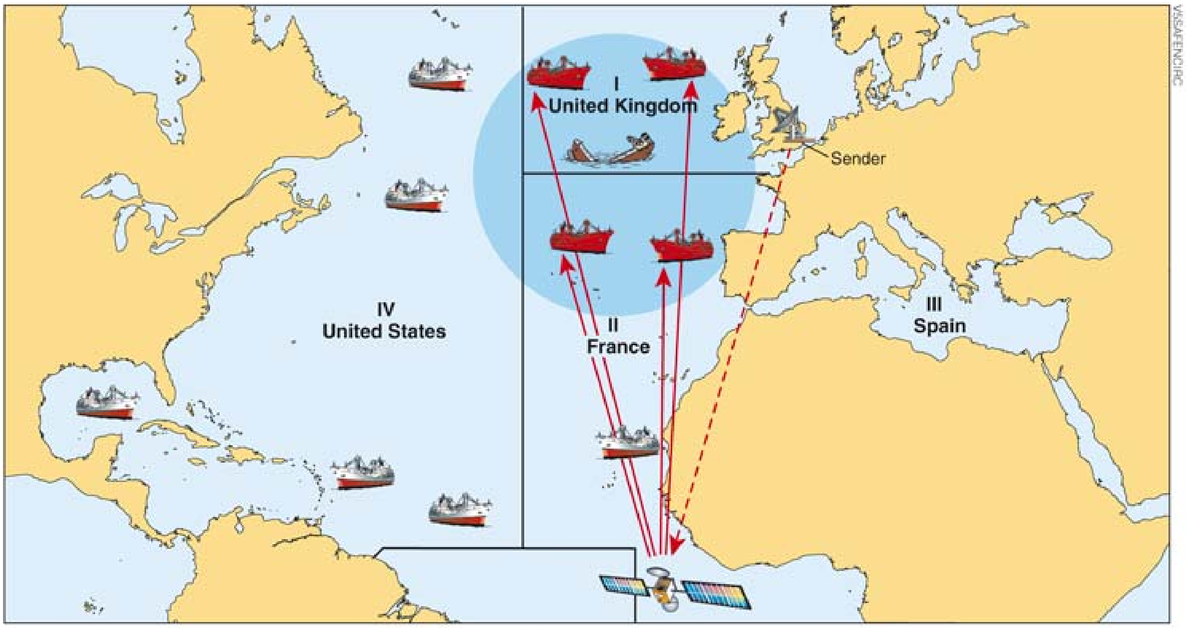


Figure 5 – SafetyNET message addressing to a circular area

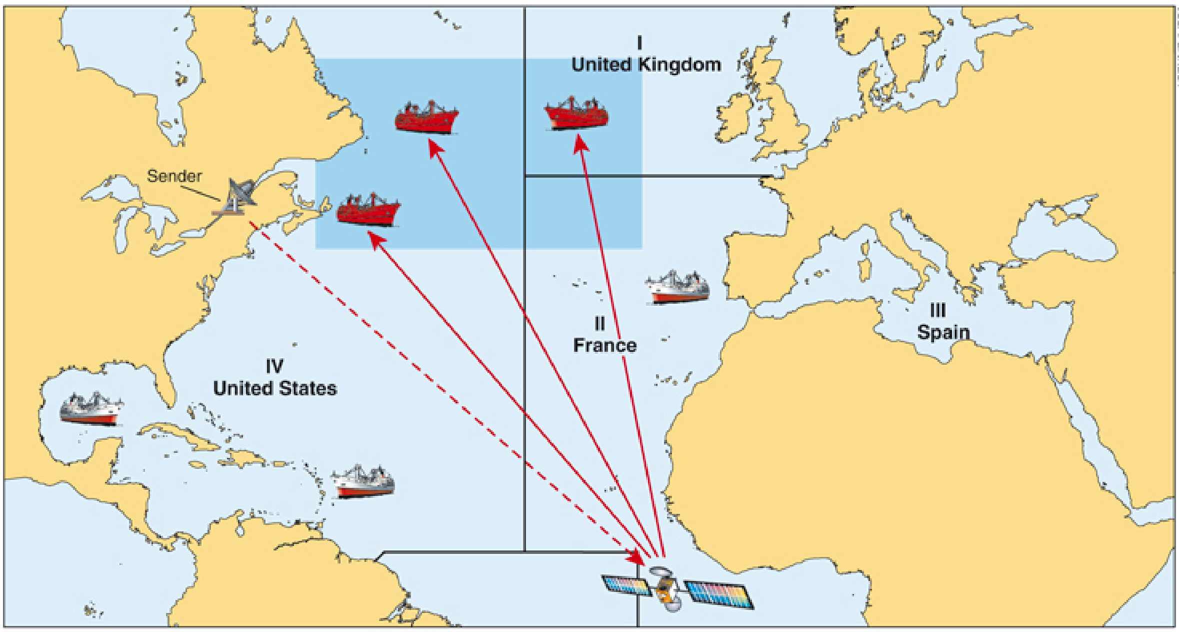


Figure 6 – SafetyNET message addressing to a rectangular area

7 – PROMULGATION OF MARITIME SAFETY INFORMATION

7.1 Maritime safety information is promulgated by officially registered information providers whose Certificates of Authorization to broadcast via SafetyNET are issued by the IMO in accordance with the procedures in Annex 2. Registered information providers include for example:

.1 NAVAREA Co-ordinators: for NAVAREA warnings and other urgent safety-related information;

.2 National Co-ordinators: for coastal warnings and other urgent safety-related information;

.3 METAREA issuing services: for meteorological warnings and forecasts; and

.4 Rescue Co-ordination Centres: for shore-to-ship distress alerts, SAR information and other urgent safety-related information.

7.2 All METAREA/NAVAREA, Sub-Area and coastal warnings shall be broadcast only in English in the international SafetyNET service in accordance with IMO resolution A.706(17), as amended. In addition to the required broadcasts in English, METAREA/NAVAREA, Sub-Area and coastal warnings may be broadcast in a national language using a national SafetyNET service.

7.3 Registered information providers shall take into account the need for contingency planning.

8 – MESSAGE FORMATTING AND C CODES

8.1 EGC messages include instructions to the LES for processing MSI in the form of a special address header that consists of five (or six) C-codes as described below. In order for a message to be correctly processed, it must always consist of data conforming to C codes "1" to "5". Additionally, C code "0" shall be used when required by the service provider.

C_0 Ocean Region code - 1 digit (when required)
0 - Atlantic Ocean Region - West
1 - Atlantic Ocean Region - East
2 - Pacific Ocean Region
3 - Indian Ocean Region
9 - all ocean regions *(Note: availability of C_0 = 9 should be checked with LES operator or service provider)*

C_1 priority code - 1 digit code
C_2 service code - 2 digit code
C_3 address code - 2, 4, 10 or 12 alphanumeric code
C_4 repetition code - 2 digit code
C_5 presentation code - normally a 2 digit code

C Codes					
C_0 Ocean Region code (when required)	**C_1 Priority code**	**C_2 Service code**	**C_3 Address code**	**C_4 Repetition code** (See Annex 4, Part E)	**C_5 Presentatio n code**
1 digit code	1 digit code	2 digit code	2, 4, 10 or 12 alphanumeric code	2 digit code	Normally a 2 digit code
0 - AOR-W 1 – AOR-E 2 – POR 3 – IOR 9 – All Ocean Regions[1]	1 - Safety 2 - Urgency 3 - Distress	00 – All ships (general call)	2 digit - 00 (All ships)	**Category (a) –** for EGC messages to be repeated a finite number of times. **Category (b) –** for EGC messages to be repeated at specified intervals until cancelled by the MSI provider.	00
		04 – Navigational, Meteorological or Piracy warning to a rectangular area	12 alphanumeric rectangular area address $D_1D_2N(S)D_3D_4D_5E(W)D_6D_7D_8D_9D_{10}$		
		13 – Navigational, Meteorological or Piracy Coastal warning	4 alphanumeric coastal warning area address $X_1X_2B_1B_2$		
		14 – Shore-to-Ship Distress Alert to a circular area	10 alphanumeric circular area address $D_1D_2N(S)D_3D_4E(W)M_1M_2M$		
		24 – Navigational, Meteorological or Piracy warning to a circular area	10 alphanumeric circular area address $D_1D_2N(S)D_3D_4E(W)M_1M_2M_3$		
		31 – NAVAREA/ METAREA warning, MET Forecast or Piracy warning to NAVAREA /METAREA	2 digit – NAVAREA/METAREA number		
		34 – SAR Coordination to a rectangular area	12 alphanumeric rectangular area address $D_1D_2N(S)D_3D_4D_5E(W)D_6D_7D_8D_9D_{10}$		
		44 – SAR Coordination to a circular area	10 alphanumeric circular area address $D_1D_2N(S)D_3D_4E(W)M_1M_2M_3$		
1) Subject to availability through LES or service provider					

8.2 The syntax of the special address header in relation to the exact number of digits and/or alphanumeric characters, and to the spaces between each C code, is critical and must conform to the format required by the LES or service provider used.

8.3 SafetyNET messages are stored at the LES until transmitted the appropriate number of times, as specified by the C_4 code, although the MSI provider may also cancel a message at any time by sending an appropriate cancellation message to the LES.

8.4 Cancellation procedure may vary between different LESs or service providers. Detailed operational procedure is contained in the instructions on sending EGC broadcast given to the MSI providers after registration with the LES operator or service providers.

8.5 Messages destined for areas of satellite overlap that are required to be transmitted through more than one Satellite, should be sent to more than one LES (i.e. one in each *satellite ocean region*) to ensure they are received by all intended ships. This may require co-ordination with adjacent NAVAREA/METAREA and other MSI providers. In an area of overlap coverage from two or three ocean region satellites, distress alert relays and urgency warnings will be broadcast over all satellites which cover the affected region.

8.6 Scheduled broadcasts are made over nominated satellites and at specified times, as allocated by the IMO International SafetyNET Co-ordinating Panel. These schedules are published in national nautical publications and the IMO Master Plan of Shore-Based Facilities for the GMDSS, as amended.

8.7 MSI providers shall adhere to their published scheduled broadcast times to facilitate reception of messages.

9 – MONITORING OF MSI BROADCASTS

9.1 In order to ensure the integrity of the MSI being broadcast, MSI providers must monitor the broadcasts which they originate in accordance to IMO resolution A.706(17), as amended. Monitoring is especially important in a highly automated system, which is dependent on careful adherence to procedure and format. This shall be accomplished by the installation of an EGC receiver to enable each MSI provider to:

.1 check that the message has been broadcast;

.2 confirm that the message is received correctly;

.3 ensure that cancellation messages are properly executed; and

.4 observe any unexplained delay in the message being broadcast.

9.2 EGC receivers only display or print messages on the first occasion they are received. Therefore, in order for MSI providers to confirm that all messages in force are still being transmitted by the LES, and that cancelled messages are no longer being transmitted, the EGC receiver used by the MSI provider to monitor their SafetyNET broadcasts should be powered down (including the transceiver), and re-booted at regular intervals, where ever this is possible.

Alternatively, MSI providers should consult their equipment supplier for specialist EGC monitoring software which would not require the MES to be re-booted.

9.3 EGC SafetyNET Log

All Inmarsat-C and mini-C MESs capable of receiving MSI, have an EGC SafetyNET Log, which contains information on all SafetyNET messages received by the terminal.

Message Number	LES	Service	Priority	Rec Date & Time	Size	Seq. No	Routeing
10022405.egc	321	MET/NAV Warning/Forecast	Safety	10-02-24 03:31	2263	1605	Prn+Mem
10022402.egc	321	SAR Coordination	Urgency	10-02-24 03:02	1506	1604	Prn+Mem
10022401.egc	322	Coastal Warning/Forecast	Safety	10-02-23 02:56	269	9154	Prn+Mem
10022302.egc	304	Distress Alert Relay	Distress	10-02-23 20:44	769	691	Prn+Mem
10022305.egc	317	NAV Warning	Safety	10-02-23 19:41	819	8318	Prn+Mem
10022302.egc	322	MET Warning	Safety	10-02-23 19:35	2358	9150	Prn+Mem

Figure 7 - Example of an EGC SafetyNET Log

This information includes:

Message number: Generated by the terminal
LES: ID of the LES which broadcast the message
Service: The MES software translates the C_2 service code used in the message address and displays a short title for the particular type message service.
Priority: The MES software translates the C_1 priority code used in the message address and displays the appropriate Priority. This could be either; Safety, Urgency or Distress.
Rec Date & Time: The date time group YY-MM-DD HH:mm of when the message was received.
Size: Usually in number of bits or characters.
Seq. No: The unique message sequence or reference number allocated to the message by the addressed LES.
Routing: Message routeing (memory or memory and printer) – set up by the MES operator or a mandatory routeing for Urgency and Distress priority messages.

10 – QUALITY CONTROL OF MSI BROADCASTS

10.1 Misuse of C-codes

Monitoring of MSI broadcasts is a vital tool to show instances of misuse of C_1 (priority), C_2 (service) and C_4 (repetition) codes and other technical or operational problems in connection with preparing and broadcasting EGC messages. Misuse of C-codes results in incorrect understanding of MSI services and types of message, multiple reception of unwanted messages received on ships and delay in receiving vital information.

10.2 Improper use of C_1 priority codes

This refers mainly to the use of service code C_2 = 14 "Ship-to-Shore distress alerts" which require using C_1 = 3 **Distress** priority code only. Problems are caused when the service code C_1 = 2 is used by mistake, as in the following example. When C_1 = 2 is erroneously used in conjunction with C_2 = 14, the header of the message received on a ship is displayed and printed as:

- LES xxx - MSG 1210 – **Distress Urgent** Call to Area: 14N 66W 300 – PosOK, where:

  – LES xxx – ID of the LES;
  – MSG 1210 – message number;
  – **Distress** Call to Area – decoding of service $C_2 = 14$;
  – **Urgent** – decoding of priority $C_1 = 2$;
  – 14N 66W 300 – circular position the message was sent to, where 14N 66W – centre of the circle and 300 is radius of the circle in nautical miles; and
  – PosOK – indicator that the MES's position status is valid or the position was updated within the last 12 hours.

The message header contains reference to two different priorities at the same time – Distress and Urgent (the same problem may be evident in the EGC log or message list), which misleads mariners about the message importance and its content. This is an important issue, particularly for non-SOLAS users, where an EGC message received with conflicting Urgency and Distress priorities may NOT be printed out automatically, which could cause a delay in reacting to the vital information.

If an EGC message is submitted with Urgency priority, service code $C_1 = 2$ and another message is sent with Distress priority afterwards, priority code $C_1 = 3$, the message with Urgency priority will be aborted and the message with Distress priority will be handled first.

10.3 Improper use of C_2 service codes

There are cases when MSI providers submit an EGC SafetyNET message using improper C_2 service codes and a sample is given below:

> LES xxx – MSG 5213 – **Met/NavWarn Urgent Call** to Area: 35N 23E 300 – PosOK
> FROM: Maritime Rescue Coordination Centre xxx
> TO: ALL SHIPS IN xxxxxxx

SAR SITREP NO: 02

FISHING BOAT 'xxx' WITH THREE PERSONS ON BOARD DEPARTED FROM xxx ISLAND ON xxx AT NOONTIME AND SINCE THEN NO INFORMATION ABOUT HER. PARTICULARS … SHIPS SAILING IN VICINITY ARE KINDLY REQUESTED TO KEEP A SHARP LOOK OUT INFORMING MRCC
REGARDS
DUTY OFFICER

The message was sent using service code $C_2 = 24$ "Met/Nav warning to circular area", as shown in the message header, but the text of the message content is concerned with SAR co-ordination. The correct C_2 code for this type of message should have been $C_2 = 14$. Use of the incorrect C_2 codes, may delay delivery of the vital SAR information.

Another example is the improper use of rectangular addressing, e.g., service code C_2 = 04, for coastal warnings whereby the addressed rectangular area covers areas far beyond coastal areas. In this case, ships receive unwanted information for areas other than those in which they are navigating.

Reception of EGC SafetyNET Coastal Warnings is an option and to receive these messages, MESs should be programmed or set up accordingly; otherwise Coastal warnings will not be received, regardless of the ship's position. If a coastal warning-type message is addressed to a rectangular area, **ALL** ships, whose position is inside the addressed rectangle, will receive the message. The main problem here is not only misusing service codes, which are specified by the International SafetyNET Manual, but reception (and printing) of multiple unwanted messages which ships may never require.

10.4 Improper use of C_4 repetition codes

Repetition codes detailed in Annex 4, Part E, are used by MSI providers to "instruct" the Inmarsat-C system to repeat a SafetyNET message a finite number of times or at specific intervals until cancelled by the information provider.

MSI is submitted for broadcast with repetitions, either 6 minutes after initial broadcast (with 6 minutes "echo") or every 1, 2, 3, 4,…48,… or 120 hours until cancelled by the MSI provider. Each message, when submitted for broadcast, is given a unique reference number. When the message is received by the MES, the reference number is "recorded" by the mobile terminal and stored in the memory. When the same message is re-broadcast later, using any C_4 repetition codes, MESs receive it and "recognize" the reference number by cross-checking the list of numbers of messages already received. Messages received with the same unique reference number will not be displayed or printed out for a second time.

***Note**: An EGC message, which requires a multiple broadcast, should be addressed with the proper repetition code and requires only a single submission to the LES. The process of repeated broadcast will be controlled by the repetition code.*

When the same SafetyNET message is submitted for broadcast for a second (or third or more) time, the addressed LES will give the message another reference or sequence number and mobile terminals will not be able to "recognize" it as the same message. In this case each subsequent message submitted to the LES for repetition will be received by MESs and may be automatically printed out.

SafetyNET monitoring shows that some MSI providers do not use the recommended repetition code and in this case MESs receive and print unwanted messages, which will fill up the MES's memory rather quickly and waste printing paper.

***Notes**:*

1. *Some MSI is broadcast only once on receipt using repetition code C_4 = 01.*

2. *Mariners are advised not to engage in routine communications during the periods designated for scheduled MSI SafetyNET broadcasts. The 6 minute repeat or echo should be used for non-scheduled broadcasts.*

Below is an example of the same weather forecast submitted for broadcast twice and having two different reference numbers:

> LES xxx – MSG 1032 – MetWarn/Fore Safety Call to Area: xx – PosOK
> xxx CSAT 23423440010402 xx-NOV-2010 09:55:41 103000
> SECURITE
> HIGH SEAS BULLETIN FOR METAREA xx ISSUED AT 0800 ON xx NOV 2010 BY THE MET OFFICE …
>
> LES xxx – MSG 1033 – MetWarn/Fore Safety Call to Area: xx – PosOK
> xxx CSAT 23423440010402 xx-NOV-2010 10:10:13 103453
> SECURITE
> HIGH SEAS BULLETIN FOR METAREA xx ISSUED AT 0800 ON xx NOV 2010 BY THE MET OFFICE

The message (size about 4,800 characters) was received and printed twice since it was submitted to the LES for broadcast twice and was given two separate reference numbers – 103000 and 103453.

If the message had been submitted once with, for example $C_4 = 11$ (transmit on receipt followed by repeat 6 minutes later), it would have been given one reference number and received and printed only once.

11 – ACCESSING THE SAFETYNET SERVICE

11.1 MSI messages are transmitted to LESs providing Inmarsat-C services in accordance with national and international routeing arrangements. Each user interface has its own access procedure and syntax command, which should be checked with the Inmarsat-C LES operator or service provider.

11.2 Some LESs may provide e-mail, or internet (direct) drop access to the SafetyNET service that allows registered MSI providers to send EGC messages using e-mail from any computer with access to the internet. Due to the nature of the internet, an e-mail service may not guarantee that EGC messages will be received by the addressed LES without delay and may not support cancellation procedures. For this reason monitoring of all EGC messages is especially important in accordance with Section 9 above.

12 – LAND EARTH STATION FUNCTIONS

12.1 Messages for transmission via the SafetyNET service are received and processed automatically at the LES. Because the system is automatic, the quality of service and information depends on accurate preparation of messages.

12.2 Messages are not reviewed for corruption or accuracy at the LES; therefore, the originator must take special care to adhere to the format specified. This dependence on syntax is one of the reasons why MSI providers must monitor the broadcasts they originate.

12.3 Participating LESs transmit SafetyNET messages over an inter-station signalling link to the Ocean Region Network Co-ordination Station (NCS) for transmission over the broadcast channel.

12.4 Messages will be queued at the LES and scheduled for transmission according to priority and instructions contained in the special address headers (C_1 – priority code and C_4 – repetition code); messages with the highest priority will be transmitted first (i.e. in the order "distress", "urgency", "safety"). The originator of each message will specify in the message parameters the desired number of repetitions and the interval between transmissions.

13 – RECEIVING SAFETYNET BROADCASTS

13.1 The basic requirements of the EGC receiver are that it should continuously receive the broadcast channel (the Inmarsat-C NCS common channel) and process the messages being transmitted through the satellite. However, certain classes of receiving equipment may not provide wholly uninterrupted monitoring of the broadcast channel. For this reason, MSI providers must repeat their most important **unscheduled messages** 6 minutes after the first broadcast.

13.2 Although the MES receives all SafetyNET messages on the broadcast channel, it may suppress some messages from being displayed or printed automatically. For example:

.1 all messages addressed to geographical areas (circular or rectangular) other than those including the ship's current position will be automatically suppressed;

.2 for coastal warnings only **(See Figure 8)** it may be programmed to suppress:

a) messages containing B_1 codes for coastal warning areas which have not been setup in the terminal,

b) messages containing B_2 codes for subject matter of no relevance to the ship.

13.3 The MES also suppresses the printing of messages previously received. It is not possible to reject mandatory "all ship" messages such as shore-to-ship distress alerts for the area within which the ship is located. When a distress or urgency message is received, an audio and visual alarm will be given.

13.4 The following B_2 code subject indicators for coastal warnings are in use:

A = Navigational warnings[7]
B = Meteorological warnings[7]
C = Ice reports
D = Search and rescue information, and acts of piracy warnings[7]
E = Meteorological forecasts
F = Pilot service messages
G = AIS
H = LORAN messages

I = not used
J = SATNAV messages
K = Other electronic navaid messages
L = Other Navigational warnings – additional to B_2 code A
V =
W =
X =
Y =
Special services allocation by the International SafetyNET Panel
Z = No messages on hand

13.5 It is recommended that, in order to ensure that all necessary MSI is available before sailing, the EGC receiver should remain in operation while the ship is in port.

[7] Cannot be rejected by the receiver.

13.6 Although reception of SafetyNET traffic is automatic, the shipboard operator must set up the receiver properly before the start of the voyage as follows:

.1 Selecting the appropriate satellite ocean region.

.2 Selecting one or more of the following (as appropriate);

a) current NAVAREA/METAREA or Sub-Area designator;

b) additional NAVAREA/METAREA designator(s);

c) relevant coastal warning area identification letter and subject indicator characters;

d) fixed position(s).

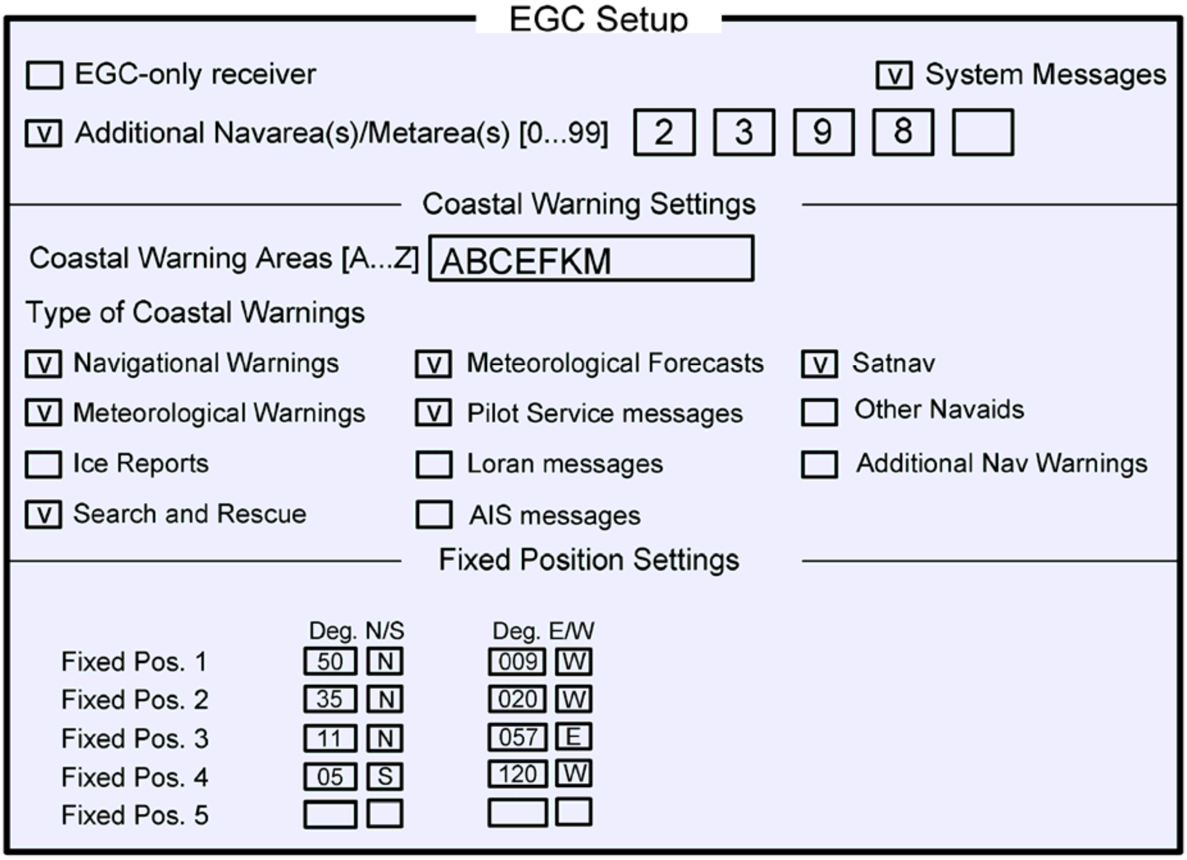


Figure 8 – EGC setup screen

Note: Figure 8 depicts the general information available on an EGC setup screen. The layout of this screen varies between different models of Inmarsat-C and mini-C MESs.

13.7 The position in MESs is up-dated automatically from integrated navigational receivers if fitted, or may be up-dated from a separate electronic position-fixing system. If there is no automatic position up-date system installed, it is recommended that the position in the MES is up-dated at least every 4 hours. If the position has not been up-dated for more than 12 hours or is unknown, all SafetyNET messages within the entire satellite ocean region will be printed or stored in the MES.

13.8 If the MES is a Class 2 Inmarsat-C terminal (having a common receiver for Inmarsat-C messages and MSI), MSI broadcasts will only be received when the terminal is idle. Therefore a Class 2 terminal must not be in use for other communications at the times of scheduled broadcasts. Similarly, it is necessary to ensure that a Class 3 Inmarsat-C MES (having two separate receivers for Inmarsat-C messages and MSI) is tuned to the calling channel of the appropriate satellite at the times of scheduled broadcasts.

Note: More information on different classes of Inmarsat-C and Mini-C MESs is in Annex 5

14 – CHARGES FOR SAFETYNET SERVICES

14.1 IMO resolution A.707(17): *Charges for Distress, Urgency and Safety Messages Through the Inmarsat System,* establishes the arrangements in place for the treatment of charges.

14.2 There are no charges to the mariner for reception of SafetyNET messages.

14.3 Message transmission charges apply to MSI providers and are set at a special SafetyNET tariff by national telecommunication service providers and LESs offering EGC services.

Annex 1

International SafetyNET Co-ordinating Panel

1 Terms of reference

To co-ordinate the development and use of the International SafetyNET Service, and in particular to:

.1 develop operating methods for the effective use of the SafetyNET service, including consideration of the need for scheduled broadcasts;
.2 develop documentation in support of the SafetyNET service, in particular the International SafetyNET Manual;
.3 advise Land Earth Station (LES) operators and potential registered information providers on all aspects of the Service, including system access and effective operation;
.4 develop criteria and establish means for the approval and registration of potential information providers;
.5 co-ordinate the registration of potential information providers; and
.6 promote a proper understanding of the benefits and use of the International SafetyNET Service among the wider maritime community.

2 Contact address

The International SafetyNET Co-ordinating Panel can be contacted at the following address:

The Chairman
International SafetyNET Co-ordinating Panel
International Maritime Organization
4 Albert Embankment
London SE1 7SR
United Kingdom
Telephone: +44 (0)20 7735 7611, Telefax: +44 (0)20 7587 3210
E-mail: info@imo.org

3 Panel membership

3.1 The International SafetyNET Co-ordinating Panel is open to membership by all Member Governments and also includes one member nominated by each of the following international organizations:

i) International Maritime Organization (IMO)
ii) World Meteorological Organization (WMO)
iii) International Hydrographic Organization (IHO)
iv) International Mobile Satellite Organization (IMSO)

3.2 The following may be represented as observers on the panel:

i) IHO World-Wide Navigational Warnings Service Sub-Committee
ii) IMO NAVTEX Co-ordinating Panel.
iii) Expert Team on Maritime Safety Services (ETMSS) of the Joint WMO/IOCCommission for Oceanography and Marine Meteorology (JCOMM)
iv) Inmarsat Global Limited

Annex 2

Authorization, Certification and Registration of SafetyNET information providers

Two distinct and separate processes, Authorization and Certification, must be completed before an information provider will be granted Registration to access the SafetyNET broadcast service. They have been established to protect the integrity of the SafetyNET information service and clearly establish a qualification to the special SafetyNET tariff.

1 Authorization

1.1 Authorization is carried out by IMO in consultation with IHO and WMO as appropriate.

1.2 In order to obtain authorization to broadcast maritime safety information through the International SafetyNET Service, an information provider must apply to the relevant international organization for approval to participate in the internationally co-ordinated service:

Meteorological authorities – to WMO;

Hydrographic authorities – to IHO;

Search and rescue authorities – to IMO;

The International Ice Patrol – to IMO;

Others – to IMO

1.3 In considering such applications, the relevant international organizations will take into account:

.1 the established and expected availability of other information sources for the area concerned; and

.2 the need to minimize duplication of information as much as possible.

1.4 The relevant international organization will inform IMO of endorsed applications.

2 Certification

2.1 On receipt of IMO authorization, the International SafetyNET Coordinating Panel will issue a Certificate of Authorization to Participate in the International SafetyNET Service directly to the information provider with a copy to IHO or WMO or IMO, as well as to Inmarsat-C LES operators. A specimen Certificate of Authorization is shown at the end of this annex.

2.2 International SafetyNET Co-ordinating Panel will maintain the master list of all registered information providers and circulate it to IMO, IHO, WMO and all Inmarsat-C LES operators.

3 Registration

3.1 After receiving a Certificate of Authorization, an information provider may conclude an agreement with any Inmarsat-C LES operator(s), serving the required ocean region(s), to obtain access to the system.

3.2 This will involve, in addition to the contractual aspects, registration of the information provider's identity which must be programmed into the LES control equipment.

3.3 LES operators will only register information providers who have received a Certificate of Authorization.

4 Contact addresses

International Maritime Organization
The Chairman
International SafetyNET Co-ordinating Panel
4 Albert Embankment
London SE1 7SR
United Kingdom

Telephone: +44 (0)20 7735 7611
Fax: +44 (0)20 7587 3210
E-mail: info@imo.org

International Hydrographic Organization
4 quai Antoine 1er
BP445
MC98011 Monaco Cedex
Principauté de MONACO

Telephone: +377 93 10 81 00
Fax +377 93 10 81 40
E-mail: info@ihb.mc

World Meteorological Organization
7bis, avenue de la Paix
Case postale 2300
CH-1211 Geneva 2
Switzerland

Telephone: + 41(0) 22 730 81 11
Fax: + 41(0) 22 730 81 81
E-mail: mmo@wmo.int

5 Sample Certificate of Authorization

IMO

4 Albert Embankment,
London SE1 7SR
United Kingdom

99 City Road,
London EC1Y 1AX
United Kingdom

[Name of authority/country]

Date: 01 Jan 2012

Certificate of Authorization to Participate as an Information Provider in the International SafetyNET Service

This is to certify that the **[Name of authority/country]** is authorized by the International Maritime Organization to provide Navigational Warning Services for broadcast in the International SafetyNET Service in accordance with Annex 2 of the International SafetyNET Manual.

PETER M. DOHERTY
Chairman
International SafetyNET Co-ordinating Panel

<u>Certificate No.</u> **"XX"**

International Maritime Organization (IMO)

Telephone:	
National	**(207) 735-7611**
International	**+44 (207) 735-7611**
Facsimile	**+44 (207) 587-3210**

International Mobile Satellite Organization (IMSO)

Telephone:	
National	**(207) 728-1249**
International	**+44 (207) 728-1249**
Facsimile	**+44 (207) 728-1172**

Annex 3

The Inmarsat system

1 Introduction

1.1 There are three essential components of the Inmarsat system:

.1 the Inmarsat space segment – the satellites and their ground support facilities – planned and funded by Inmarsat;

.2 the ground segment – comprises a network of Land Earth Stations (LESs), Network Coordination Stations (NCSs) and the Network Operations Centre (NOC). Each LES provides an interface between the space segment and the national and international fixed telecommunication networks; and

.3 the Mobile Earth Stations (MESs) – comprises mobile satellite communication terminals.

2 Bandwidths

2.1 Shore-to-ship communications are in the 6 GHz band (C-band) from the LES to the satellite and in the 1.5 GHz band (L-band) from satellite to ship. Ship-to-shore communications are in the 1.6 GHz band (L-band) from the ship to the satellite and in the 4 GHz band (C-band) from satellite to LES.

3 The space segment

3.1 To provide the space segment for global coverage, Inmarsat employs its own dedicated satellites.

3.2 The space segment is segmented globally into four ocean regions: Atlantic Ocean Region East (AOR-E), Atlantic Ocean Region West (AOR-W), Indian Ocean Region (IOR) and Pacific Ocean Region (POR). Each ocean region is served by a dedicated satellite. Inmarsat has full contingency plans in place in the unlikely event of any prime satellite outage. These plans are exercised regularly and are witnessed by the International Mobile Satellite Organization (IMSO). The Polar Regions – above approximate latitudes 76° N and 76° S - cannot be seen by geostationary satellites **(See Figures 3 & 4)**.

4 The ground segment

4.1 The Inmarsat system is connected into the world-wide telecommunication networks via LESs. Many of these LESs provide Inmarsat-C EGC services.

4.2 For Inmarsat-C communication system there is a Network Coordination Station (NCS) in each ocean region, which monitors and controls communications traffic within its region. Each NCS communicates with the LESs in its ocean region, the other NCSs and the Network Operations Centre (NOC). Inmarsat-C NCSs also transmit EGC SafetyNET and FleetNET messages on the NCS common channel.

4.3 The Inmarsat Network Operations Centre (NOC) is located in London at the Inmarsat headquarters and functions around the clock, co-ordinating the activities of the NCSs and the LESs in each ocean region.

5 Mobile Earth Stations (MESs)

5.1 Inmarsat-C and mini-C MESs with the EGC function are small, lightweight terminals, with small omni-directional antennas, for providing data and message-type services. EGC receive capability is provided by Class 2 or 3 Inmarsat-C MESs. Interfaces via RS232 ports are provided for a dedicated messaging unit, personal computer or any other data terminal equipment for message generation and display.

5.2 Class 0 standalone EGC receivers provide the capability to receive SafetyNET and FleetNET messages only; there is no transmit or receive capability for sending and receiving messages.

5.3 The technical requirements of all classes of equipment are detailed in Annex 5.

Annex 4

Operational guidance

1 This annex contains operational guidance for the benefit of registered MSI providers who are responsible for preparing messages for broadcast via the International SafetyNET Service. **Use of the codes given in this annex is mandatory for all messages in the system.**

2 Types of messages and message formats are detailed in the sub-parts of this Annex.
PART A – Navigational warning service
PART B – Meteorological service
PART C – Search and rescue (SAR) services and SAR coordination traffic
PART D – Piracy countermeasures broadcast messages

Allocation of priority and service codes for EGC SafetyNET services		
EGC SafetyNET service	**Message priority**	**Service code (type)**
Navigational Warning services	C_1 = 1 (Safety) - normally C_1 = 2 (Urgency) - exceptionally at discretion of MSI provider	C_2 = 04 - Navigational warning to a rectangular area C_2 = 13 - Coastal warnings C_2 = 24 - Navigational warnings to a circular area C_2 = 31 - NAVAREA warnings
Meteorological services	C_1 = 1 (Safety) - always for forecasts and warnings C_1 = 2 (Urgency) - always for urgent tropical cyclone warnings only	C_2 = 04 - Meteorological warning to a rectangular area C_2 = 13 - Met warnings or forecasts to a coastal area C_2 = 24 - Met warnings to a circular area C_2 = 31 - METAREA warnings or MET forecasts
SAR services: 1) shore-to-ship distress alert	C_1 = 3 (Distress) - always	C_2 = 14 - Shore-to-ship Distress Alert to a circular area
2) SAR co-ordination traffic	C_1 = 1 (Safety) - determined by the phase of emergency C_1 = 2 (Urgency) – determined by the phase of emergency C_1 = 3 (Distress) - determined by the phase of emergency	C_2 = 34 - SAR co-ordination to a rectangular area C_2 = 44 - SAR co-ordination to a circular area
3) shore-to-ship urgency & safety traffic	C_1 = 1 (Safety) C_1 = 2 (Urgency)	C_2 = 31 - Urgency and Safety traffic
4) general (all ships call within the Inmarsat ocean region)	C_1 = 2 (Urgency) C_1 = 3 (Distress)	C_2 = 00
Piracy countermeasures broadcast messages	C_1 = 1 (Safety) C_1 = 2 (Urgency) - for piracy attack warnings.	C_2 = 04 - Navigational warning to a rectangular area C_2 = 13 - Coastal warnings C_2 = 24 - Navigational warnings to a circular area C_2 = 31 - NAVAREA warnings

3 The broadcast parameters are controlled by the use of five (or six) C-codes which are combined into a generalized message address header format as follows:

$$C_0:C_1:C_2:C_3:C_4:C_5$$

(Spaces, colons or other delimiters between these codes will be required, depending on the communication protocol of the addressed LES)

C_0 - Ocean Region.

C_1 - Message Priority
C_2 - Service code
C_3 - Address code
C_4 - Repetition code
C_5 - Presentation code

Each C-code controls a different broadcast parameter and is assigned a numerical value according to the options specified in the following parts.

The additional C_0 code will only be required to identify the satellite ocean region when sending a broadcast message to a LES which operates to more than one satellite ocean region, as follows:

C_0 = 0 – AOR-W
C_0 = 1 – AOR-E
C_0 = 2 – POR
C_0 = 3 – IOR
C_0 = 9 – All Ocean Regions[8]

4 (a) All EGC messages should comprise of three elements:

Address header instruction (EGC C Codes)
TEXT OF MESSAGE
NNNN

Mandatory message element table	
Message Element	**Remarks**
Address header instruction	The syntax of the special address header in relation to the exact number of digits and/or alphanumeric characters, and to the spaces between each C code is critical, and must conform to the format required by the LES or service provider as supplied in their specific instruction manual.
TEXT OF MESSAGE	The content of the message should be presented in UPPER Case. For Maritime Safety Information messages, the format of Navigational Warnings is defined in the Joint IMO/IHO/WMO Maritime Safety Information Manual as amended.
NNNN	The letters NNNN should be inserted at the end of the text to indicate "end of message".

[8] Subject to availability through LES or service provider.

(b) EGC messaged submitted for transmission (or broadcast) via a two stage access system must also include an end of transmission instruction code for the LES. This should be inserted on the final line, after NNNN. This code may vary, and must conform to the format required by the LES or service provider as supplied in their specific instruction manual.

5 The International Maritime Organization (IMO) requires that, in order to allow the use of non-dedicated receive facilities, the majority of broadcasts on the International SafetyNET Service are made at scheduled times. Broadcast schedules must be co-ordinated through the International SafetyNET Co-ordinating Panel, which can also offer advice on ways of scheduling information within the system.

6 Because errors in the header format of a message may prevent it being released, MSI providers must install an Inmarsat SafetyNET receiver and monitor broadcasts of messages which they originate.

7 For all the services described below, a cancellation or deleting facility is provided for messages transmitted to a LES with Category (b) repetition codes **(See Part E)**. Cancellation (or deletion) procedures may vary between different LESs or service providers. Detailed operational procedure is contained in the instructions on sending EGC broadcast given to the MSI providers after registration with the LES operator or service provider.

8 The term "echo" used in all of the services described below in Parts A, B, C & D, is associated with using the respective C_4 repetition codes which will initiate an automatic repeated broadcast 6 minutes after the initial scheduled or unscheduled broadcast. The 6 minute repeat or echo is used to ensure that the warning is received by the maximum number of ships.

Part A - Navigational warning services

1 The following guidelines set out the arrangements to be used for promulgating navigational and coastal warnings via SafetyNET for the GMDSS**. They are mandatory for broadcasts in the International SafetyNET Service. Broadcasts originated by the International Ice Patrol also follow the guidelines in this Part.**

2 These guidelines are to be read in conjunction with the IMO/IHO World-Wide Navigational Warning Service (WWNWS) Guidance Document (IMO resolution A.706(17), as amended).

3 Navigational warnings that require an immediate broadcast should be transmitted as soon as possible after receipt. If still in force, they should be repeated in subsequent scheduled broadcasts, twice a day for six weeks or until cancelled.

4 Navigational warnings shall remain in force until cancelled by the originating Coordinator. Navigational warnings should be broadcast for as long as the information is valid; however, if they are readily available to mariners by other official means, for example in Notices to Mariners, then after a period of six weeks they may no longer be broadcast. If the navigational warning is still valid and not available by other means after 6 weeks, it should be re-issued as a new navigational warning.

5 The following C-codes shall be used for warnings issued under the auspices of the WWNWS.

5.1 C_1 – Message priority

C_1 = 1 (safety)
C_1 = 2 (urgency) (at discretion of the registered MSI provider).

5.2 C_2 – Service code

C_2 = 04	NAVAREA warnings for a rectangular area
C_2 = 13	Coastal warnings
C_2 = 24	Navigational warnings to a circular area
C_2 = 31	NAVAREA warnings

5.3 *C_3 – Address code*

C_3 = two digits X_1X_2	When C_2 = 31, then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 - 21).
C_3 = four alphanumeric characters $X_1X_2B_1B_2$	When C_2 = 13 for Coastal warnings, then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 - 21). B_1 is the coastal warning area A to Z B_2 is the subject indicator must always be A or L, where: A = Navigational warnings L = Other Navigational warnings
C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 04 for NAVAREA warnings within a rectangular area. D_1D_2 is latitude of south-west corner of the rectangle in degrees. La is hemisphere which will always be N for Arctic NAVAREAs XVII to XXI. $D_3D_4D_5$ is longitude of south-west corner of rectangle in degrees, with leading zeros if required. Lo is longitude E or W. D_6D_7 is extent of rectangle in latitude (degrees). $D_8D_9D_{10}$ is extent of rectangle in longitude (degrees).
Example: a rectangle whose south-west corner is 60º N and 010º W, extending 30º north and 25º east, is coded as: 60N010W30025 *Note*: Latitude and longitude are limited by values from 00º to 90º latitude and 000º to 180º longitude.	

5.4 *C4 – Repetition code*

C_4 = 01	May be used for initial unscheduled broadcast of NAVAREA warnings, and coastal warnings with no echo. (transmit once on receipt)
C_4 = 11	Recommended for use with initial unscheduled broadcast of NAVAREA warnings, and coastal warnings. (transmit on receipt, echo 6 minutes later)
C_4 = 16	Use for NAVAREA or Coastal warnings scheduled for broadcast twice per day at 12 hour intervals with safety priority.
Note. For NAVAREA or Coastal warnings scheduled for broadcast more than twice per day, the appropriate C_4 repetition code detailed in **PART E** of this Manual must be used.	

5.5 *C5 – Presentation code*

C_5 = 00	The code 00 for International Alphabet Number 5 is normally used

Part B - Meteorological services

1 The following guidelines set out the arrangements to be used for promulgating meteorological forecasts and warnings via SafetyNET for the GMDSS. **They are mandatory for broadcasts in the International SafetyNET Service.**

2 These guidelines are to be read in conjunction with the WMO Manual on Marine Meteorological Services (WMO No. 558), as revised for the GMDSS.

3 In order to ensure uniformity of meteorological forecasts and warnings globally, the following C-codes should be used for meteorological services via SafetyNET.

3.1 *C_1 – Message priority*

C_1 = 2 (urgency)	Only use for tropical cyclone warnings or urgent meteorological warnings with force 12 Beaufort or above.
C_1 = 1 (safety)	For forecasts and other meteorological warnings.

3.2 *C_2 – Service code*

C_2 = 24	Meteorological warnings to a circular area
C_2 = 31	Meteorological warnings or forecasts to METAREA
C_2 = 13	Meteorological warnings or forecast to coastal warning area
C_2 = 04	METAREA warnings or forecasts for a rectangular area

3.3 *C_3 – Address code*

C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 24 for Meteorological warnings to user defined circular area, then: D_1D_2La (three characters) is latitude of centre in degrees, and La whether north (N) or south (S). A leading zero should be used for latitudes less than 10º. $D_3D_4D_5Lo$ (four characters) is longitude of centre in degrees, and Lo whether east (E) or west (W) of the prime meridian. One or two leading zeros should be used for longitudes less than 100º. $R_1R_2R_3$ (three characters) is radius of circle in nautical miles, up to 999. One or two leading zeros should be used for radius less than 100 nm.
Example: A circle centred at latitude 56°N longitude 34°W with radius of 35 nautical miles is coded as: 56N034W035	
C_3 = two digits XX	When C_2 = 31, then: C_3 = the two digits of the METAREA number (with a leading zero where necessary in the range 01 – 21)

C_3 = four alphanumeric characters $X_1X_2B_1B_2$	When C_2 = 13 for Coastal warnings, then: X_1X_2 are the two digits of the METAREA number (with a leading zero where necessary in the range 01 - 21). B_1 is the coastal warning area A to Z B_2 is the subject indicator must always be B or E, where: B = Meteorological warnings E = Meteorological forecasts
C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 04 for Meteorological warnings or forecasts within a rectangular area *Note: The definition of 12 characters for a Rectangular address is given in Part A, paragraph 5.3.*

3.4 *C_4 – Repetition code*

Category (a) repetition codes are used for meteorological services as follows:	
C_4 = 01	Use for Meteorological forecast (transmit once on receipt).
C_4 = 11	Use for Meteorological warning (transmit on receipt followed by repeat 6 minutes later).

3.5 *C_5 – Presentation code*

C_5 = 00	The code 00 for International Alphabet Number 5 is normally used.

Part C - Search and rescue services

1 The following guidelines set out the arrangements to be used by Rescue Co-ordination Centres (RCCs) for initiating transmission of shore-to-ship distress alert relays and shore-to-ship search and rescue information. Transmissions should be in accordance with the relevant procedures of the International Telecommunication Union (ITU) Radio Regulations (RR), the International Convention on Maritime Search and Rescue, 1979, as amended, and the IAMSAR Manual.

2 In order to ensure uniformity of the search and rescue broadcast product throughout the world, C-codes should be used as described in this Part.

3 Shore-to-ship distress alert relays

3.1 As a general principle, distress alert relays should be addressed to a circular area around the estimated or known position of the distressed vessel. The radius of the circle should be chosen to take account of the accuracy of the datum position, the expected density of shipping in the vicinity and the fact that the position can only be defined in the message address to the nearest whole degree of latitude and longitude. The distress alert relay message must be broadcast via all satellites which cover the area concerned. Shore-to-ship distress alert relays sent by the International SafetyNET Service should contain the identification of the unit in distress, its approximate position and other information which might facilitate rescue. C-codes should be as follows:

3.2 ***C_1* – Message priority**

C_1 = 3 (distress)

3.3 ***C_2* – Service code**

C_2 = 14 (shore-to-ship distress alert to circular areas)	Messages addressed to circular areas will only be received and printed out by EGC receivers that are located inside the circle or have not had their position kept up to date.

3.4 *C_3 – Address code*

C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 14 for Distress Alert to user defined circular area, then: D_1D_2La (three characters) is latitude of vessel in distress in degrees (two digits) and whether north (N) or south (S): e.g., 39N (three characters total). A leading zero should be included for latitudes less than 10º. $D_3D_4D_5Lo$ (four characters) is longitude of vessel in distress in degrees (three digits) and whether east (E) or west (W) of the prime meridian: e.g. 059W. A leading zero or zeros should be included for longitudes less than 100º or 10º as appropriate: e.g., use 099 for 99º and 008 for 8º. $R_1R_2R_3$ (three characters) is alert radius around distressed vessel in nautical miles. To ensure that position inaccuracies of both the distressed vessel and nearby vessels to which the message is intended do not affect receipt of messages, radius values of 200 nautical miles or larger should normally be used. Note that if a vessel's own position information is not entered into its SafetyNET receiver, every shore-to-ship distress alert relay message transmitted to the Inmarsat ocean region will be received and printed.

3.5 *C_4 – Repetition code*

C_4 = 11	Use for Distress Alerts (transmit on receipt followed by repeat 6 minutes later)

3.6 *C_5 – Presentation code*

C_5 = 00	The code 00 for International Alphabet Number 5 is normally used.

4 General (all ships) call

4.1 When the RCC has no indication of the position of the vessel in distress, shore-to-ship distress alert relays may be sent as general call. This will be printed in every vessel within the Inmarsat ocean region, provided the receiver is tuned to the proper ocean region satellite.

Note: This method of alert should rarely be used.

The C_0:C_1:C_2:C_3:C_4:C_5 codes for general calls are always as follows: C_0 = 0 (1, 2 or 3) (if required) C_1 = 3 (distress) or 2 (urgency) C_2 = 00 C_3 = 00 C_4 = 11 C_5 = 00

5 Search and rescue co-ordination traffic

5.1 Search and rescue co-ordination messages should be addressed to user defined circular or rectangular areas for the intent of co-ordinating the search and rescue of a vessel in distress. Priority of the message will be determined by the phase of the emergency.

5.2 *C_1 – Message priority*

C_1 = 3 (distress), 2 (urgency) or 1 (safety)

5.3 *C_2 – Service code*

C_2 = 34	Search and rescue coordination to a rectangular area.
C_2 = 44	Search and rescue coordination to a circular area.

5.4 *C_3 – Address code*

C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 34 Search and rescue coordination to a rectangular area. *Note: The definition of 12 characters for a Rectangular address is given in Part A, paragraph 5.3*
C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 44 Search and rescue coordination to a circular area. *Note: The definition of 10 characters for a circular address is given in Part C, paragraph 3.3.*

5.5 *C_4 – Repetition code*

C_4 = 11	Use for Distress Alerts (transmit on receipt followed by repeat 6 minutes later)

5.6 *C_5 – Presentation code*

C_5 = 00	The code 00 for International Alphabet Number 5 is normally used

6 Shore-to-ship urgency and safety traffic

6.1 As a general principle, only the minimum information consistent with the safety of navigation should be broadcast. However, where such information is deemed essential, shore-to-ship information other than distress should be broadcast to a NAVAREA using C-codes as follows:

6.2 *C_1 – Message priority*

C_1 = 2 (urgency) or 1 (safety)

6.3 *C_2 – Service code*

C_2 = 31

6.4 *C_3 – Address code*

C_3 = two digits X_1X_2	When C_2 = 31, then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 - 21).

6.5 *C_4 – Repetition code*

C_4 = 11	Use for unscheduled broadcasts of urgency and safety traffic (transmit on receipt followed by repeat 6 minutes later)

6.6 *C_5 – Presentation code*

C_5 = 00	The code 00 for International Alphabet Number 5 is normally used

7 SAR broadcast for overlapping satellite ocean regions

7.1 Search and rescue distress and urgency broadcasts should be promulgated through all Inmarsat satellites serving the area surrounding the vessel in distress. This is to ensure that vessels with receivers tuned to any ocean region satellite serving the area will receive the message.

Part D - Piracy countermeasures broadcast messages

1 On receiving a message of alert or any other information concerning a threat of attack (from the Security Forces Authority responsible for the operational application of the urgency plans (countermeasures) in the region or another MRCC, for example), the MRCC should ask the NAVAREA co-ordinator (or any other competent authority in accordance with local arrangements), to send out a warning through the appropriate MSI network (NAVTEX or SafetyNET) and other broadcasting networks for warnings to shipping, if these exist.

2 There are two kinds of MSI broadcast messages associated with piracy countermeasures: the daily situation report (SITREP) and a piracy attack warning. Specific guidance on drafting and broadcasting these messages is given below.

3 The daily situation report should be broadcast via SafetyNET at a regular time around 0800 local time daily. The following paragraphs provide specific guidance on broadcast procedures.

4 The daily situation report should be broadcast to a rectangular area enclosing the region of probable piracy attacks (based on historical data) plus a margin of 700 nautical miles (24 hours' steaming by a fast ship) in every direction.

5 The following C codes illustrate those to be used for SafetyNET broadcasts of the daily SITREP:

5.1 ***C_1 – Message priority***

C_1 = 1 (safety)

5.2 ***C_2 – Service code***

C_2 = 04	SITREP to a rectangular area.
C_2 = 24	SITREP to a circular area.

5.3 ***C_3 – Address code***

C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 04 SITREP to a rectangular area. *Note: The definition of 12 characters for a Rectangular address is given in Part A, paragraph 5.3*
C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 24 SITREP to a circular area. *Note: The definition of 10 characters for a circular address is given in Part C, paragraph 3.3.*

5.4 ***C_4 – Repetition code***

C_4 = 18	Broadcast every 24 hours (no echo) until cancelled

5.5 ***C_5 – Presentation code***

C_5 = 00	The code 00 for International Alphabet Number 5 is normally used

6 A piracy attack warning shall be broadcast as an "URGENT" NAVAREA or Coastal Warning immediately on receipt of the source information and at least at the next scheduled broadcast or for as long as the information remains valid. In the area of overlap coverage from two or three ocean region satellites, urgent warnings will be broadcast over all satellites which cover the affected region. Subject indicator character B2 = L should be used in Coastal Warning areas. The specific area in which the attack has taken place is to be quoted in the first line of the text, using no more detail than is necessary to indicate the probable location of further attacks, e.g., WESTERN PHILIP CHANNEL or VICINITY HORSBURGH LIGHT. The description of the pirate vessel and its last observed movements are to be kept as brief as possible and should give only those details which are of significance in avoiding other attacks.

7 The following C codes illustrate those to be used for SafetyNET broadcast of Piracy attack warnings:

7.1 *C_1 – Message priority*

C_1 = 2 (urgency)

7.2 *C_2 – Service code*

C_2 = 13	Coastal Warnings
C_2 = 31	NAVAREA Warnings

7.3 *C_3 – Address code*

C_3 = two digits X_1X_2	When C_2 = 31 then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 to 21).
C_3 = four alphanumeric characters $X_1X_2B_1B_2$	When C_2 = 13 for Coastal warnings then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 to 21). B_1 is the coastal warning area A to Z. B_2 is the subject indicator and must always be A or L, where A = Navigational warnings L = Other navigational warnings

7.4 *C_4 – Repetition code*

C_4 = 16	Broadcast every 12 hours with no echo until cancelled.

7.5 *C_5 – Presentation code*

C_5 = 00	The code 00 for International Alphabet Number 5 is normally used

8 Date/time should always be quoted in the form DDHHMM UTC MoMoMo YY, e.g.,

251256 UTC JUN 12.

Note: UTC (Universal Co-ordinated Time) is the same time-zone as GMT (Z).

9 Geographical positions should be quoted in the standard format:
$D_1D_2M_1M_2$La $D_3D_4D_5M_3M_4$Lo where:

D_1D_2 = degrees latitude (with leading zero if required)
M_1M_2 = minutes latitude
La = hemisphere (N or S)
$D_3D_4D_5$ = degrees longitude (with leading zeros if required)
M_3M_4 = minutes longitude
Lo = longitude (E or W)

as in the example: 5419N10327E

Notes:

1. Examples of format and drafting guidance for Piracy Warnings is contained in the Joint IMO/IHO/WMO Manual on Maritime Safety Information (IMO MSC.1/Circ.1310 and IHO Special Publication No. S53.)

2. Decimals of minutes will seldom be necessary or appropriate for reports of this kind.

3. Where the name of a geographical feature is used instead of a geographical position, a name should be chosen that appears on all commonly used charts of the area. Local knowledge should not be required for understanding the message.

Part E - Repetition codes (C_4)

1 The C_4 repetition codes are divided into two categories:

Category (a) for messages that are required to be repeated a finite number of times; and

Category (b) for messages that are required to be repeated at specified intervals until cancelled by the MSI provider.

1.1 *Category (a) repetition codes:*

Code	Instruction
01	transmit once on receipt
11	transmit on receipt followed by repeat 6 minutes later
61	transmit on receipt and 1 hour after initial broadcast (twice)
62	transmit on receipt and 2 hours after initial broadcast (twice)
63	transmit on receipt and 3 hours after initial broadcast (twice)
64	transmit on receipt and 4 hours after initial broadcast (twice)
66	transmit on receipt and 12 hours after initial broadcast (twice)
67	transmit on receipt and 24 hours after initial broadcast (twice)
70	transmit on receipt, 12 hours after initial broadcast and then12 hours after the second broadcast (three times)
71	transmit on receipt, 24 hours after initial broadcast and then 24 hours after the second broadcast (three times)

1.2 *Category (b) repetition codes:*

A Category (b) repetition code allows a message to be repeated indefinitely or until cancelled by the message provider. The repetition period can be set at between 1 and 120 hours. In addition, each transmission can be echoed after a fixed period of 6 minutes. Repetition codes are made up by stating the multiplier first, followed by the delay period:

Multiplier x Delay

where the multiplier specifies the amount of delay periods between each broadcast, and the delay is a fixed number of hours. The **multiplier** digit may be any digit from 1 to 5 as follows:

1 = 1 specified delay period between broadcasts
2 = 2 specified delay periods between broadcasts
3 = 3 specified delay periods between broadcasts
4 = 4 specified delay periods between broadcasts
5 = 5 specified delay periods between broadcasts

The **delay** digit coding is as follows:

2 = 1 hour delay; no echo
3 = 1 hour delay; with echo
4 = 6 hour delay; no echo
5 = 6 hour delay; with echo
6 = 12 hour delay; no echo
7 = 12 hour delay; with echo
8 = 24 hour delay; no echo
9 = 24 hour delay; with echo

The various combinations (Multiplier x Delay) available, are shown in the table below:

Code	Instruction
12	repeat broadcast every 1 hour with no echo.
13	repeat broadcast every 1 hour with an echo 6 minutes after each broadcast.
22	repeat broadcast every 2 hours with no echo.
23	repeat broadcast every 2 hours with an echo 6 minutes after each broadcast.
32	repeat broadcast every 3 hours with no echo.
33	repeat broadcast every 3 hours with an echo 6 minutes after each broadcast.
42	repeat broadcast every 4 hours with no echo.
43	repeat broadcast every 4 hours with an echo 6 minutes after each broadcast.
52	repeat broadcast every 5 hours with no echo.
53	repeat broadcast every 5 hours with an echo 6 minutes after each broadcast.
14	repeat broadcast every 6 hours with no echo.
15	repeat broadcast every 6 hours with an echo 6 minutes after each broadcast.
16 (or 24)	repeat broadcast every 12 hours with no echo.
17 (or 25)	repeat broadcast every 12 hours with an echo 6 minutes after each broadcast.
34	repeat broadcast every 18 hours with no echo.
35	repeat broadcast every 18 hours with an echo 6 minutes after each broadcast.
18 (or 26; or 44)	repeat broadcast every 24 hours with no echo.
19 (or 27; or 45)	repeat broadcast every 24 hours with an echo 6 minutes after each broadcast.
54	repeat broadcast every 30 hours with no echo.
55	repeat broadcast every 30 hours with an echo 6 minutes after each broadcast.
36	repeat broadcast every 36 hours with no echo.
37	repeat broadcast every 36 hours with an echo 6 minutes after each broadcast.
28 (or 46)	repeat broadcast every 48 hours with no echo.
29 (or 47)	repeat broadcast every 48 hours with an echo 6 minutes after each broadcast.
56	repeat broadcast every 60 hours with no echo.
57	repeat broadcast every 60 hours with an echo 6 minutes after each broadcast.
38	repeat broadcast every 72 hours with no echo.
39	repeat broadcast every 72 hours with an echo 6 minutes after each broadcast.
48	repeat broadcast every 96 hours with no echo.
49	repeat broadcast every 96 hours with an echo 6 minutes after each broadcast.
58	repeat broadcast every 120 hours with no echo.
59	repeat broadcast every 120 hours with an echo 6 minutes after each broadcast.

Note – Not all codes may be provided by all service providers.

Annex 5

EGC receiver specifications

These technical requirements were defined by Inmarsat for equipment manufacturers and have been extracted from the System Definition Manual (SDM) for the Inmarsat-C communications system.

Enhanced Group Call (EGC) receive facilities are used by SOLAS Convention ships as well as ships not required to comply with the requirements of the SOLAS Convention, as amended. It should be noted that EGC receive facilities intended to meet SOLAS Convention requirements must comply with the IMO Recommendation on Performance Standards for Enhanced Group Call Equipment contained in IMO resolution [A.664(16), as amended].

The specific guidance given in this annex has been carefully coordinated to ensure that the automatic functions of the SafetyNET receiver work properly. Land Earth Stations providing Inmarsat-C services for the GMDSS must comply with all relevant aspects of the Inmarsat-C SDM, including provision of the EGC SafetyNET services.

Technical requirements for Enhanced Group Call receivers for SOLAS-compliant MESs

1 EGC SafetyNET receivers for SOLAS installations

1.1 Background

The global maritime distress and safety system (GMDSS) is a radiocommunication system based on satellite and terrestrial technology, designed to improve communications relating to distress and safety of life at sea. It was adopted by the International Maritime Organization (IMO) in 1988, in the form of Amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974 and came into effect on 1 February 1992. Implementation was completed on 1 February 1999.

It is the responsibility of national Administrations to determine whether a radio installation on board a ship meets the SOLAS requirements. This is done by national Type Acceptance or Approval testing of the sub-systems included in the installation and by inspection of the complete installation by a radio surveyor.

National Type Acceptance testing for SOLAS equipment is usually based on GMDSS specifications and procedures prepared by IMO and the International Electrotechnical Commission (IEC) on their behalf, although other national or regional specifications may be invoked as well.

IMO and IEC documents, which are identified in section 1.2, do not only summarize the general requirements for GMDSS equipment, but also the special requirements for EGC SafetyNET receivers for use in SOLAS installations, as specified by IMO/IEC.

A number of the Inmarsat specifications have been completely revised to reflect the latest IMO/IEC requirements, for example, electromagnetic compatibility and environmental requirements.

1.2 Principal relevant documents

For Inmarsat-C and mini-C GMDSS compliant MESs with EGC SafetyNET function, the principal relevant documents in addition to the Inmarsat-C SDM are:

.1 Performance Standards for Enhanced Group Call Equipment – Annex: Recommendation on Performance Standards for Enhanced Group Call Equipment, published by IMO as resolution [A.664(16), as amended].

.2 General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids, published by IMO as resolution A.694(17).

.3 Performance Standards for Inmarsat Standard-C Ship Earth Stations Capable of Transmitting and Receiving Direct-printing Communications – Annex: Recommendation on Performance Standards for Inmarsat Standard-C Ship Earth Stations Capable of Transmitting and Receiving Direct-printing Communications, published by IMO as resolution A.807(19), as amended by resolution MSC.68(68), annex 4.

.4 Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System and Marine Navigational Equipment, published by the IEC as IEC 60945.

.5 Global Maritime Distress and Safety System (GMDSS) – Part 4: Inmarsat-C Ship Earth Station and Inmarsat Enhanced Group Call (EGC) Equipment – Operational and Performance Requirements, Methods of Testing and Required Test Results, published by the IEC as IEC 61097-4.

.6 Maritime Design and Installation Guidelines (DIGs), Annex B, issue 6 of April 2008 published by Inmarsat at:
http://www.inmarsat.com/Maritimesafety/DIGs.pdf

2 Introduction

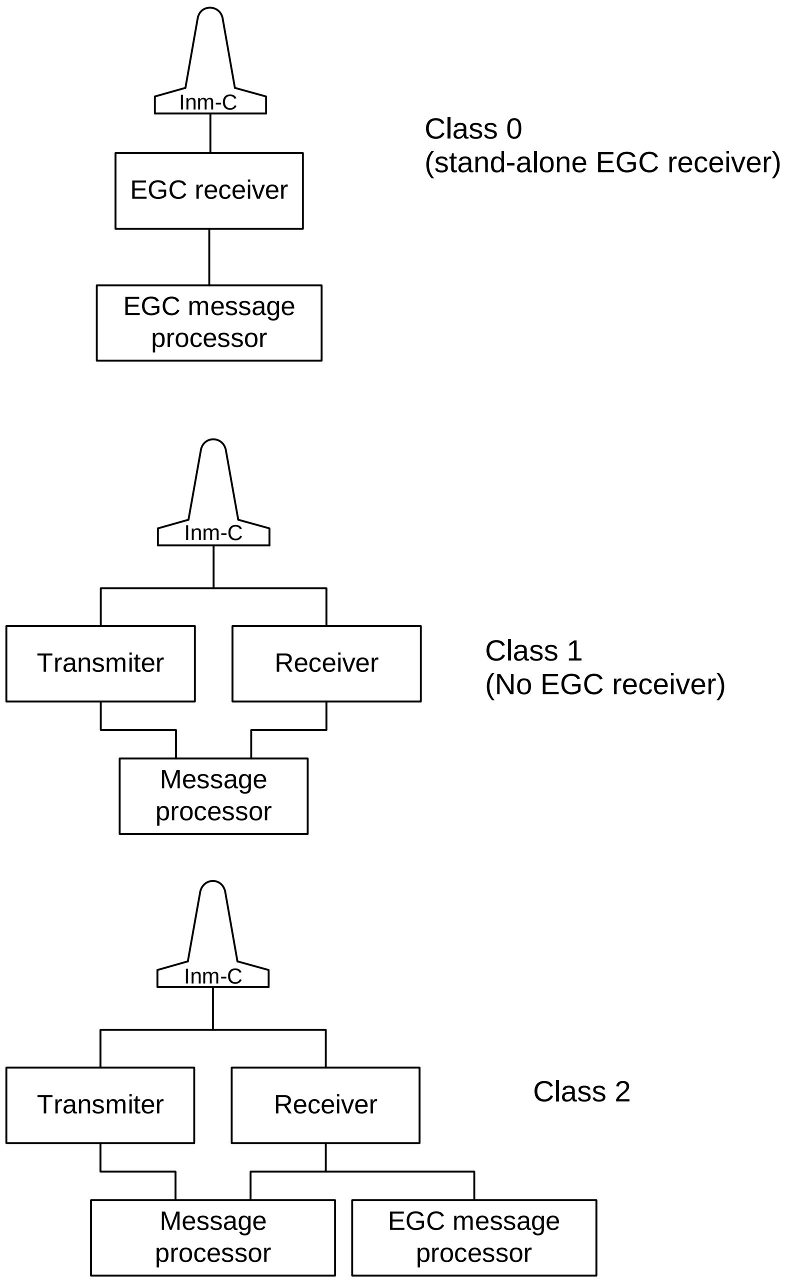
2.1 Enhanced Group Calls

Enhanced Group Calls are a message broadcast service transmitted over the Inmarsat-C communications system. The service allows terrestrial information providers to pass messages or data to Class 2 or Class 3 MESs with EGC receivers or Class 0 stand-alone EGC receivers through the Inmarsat-C LESs. The messages are processed at the addressed LES and forwarded to the NCS which transmits them on the common channel.

2.2 EGC receiver

An EGC receiver is defined as a single-channel receiver with a dedicated message processor. Mobile Earth Stations of Class 2 and 3 provide an EGC capability in addition to To-Ship and From-Ship messaging capabilities; class 0 MESs are self-contained EGC receivers as shown in Figure 9.

Note: Most of the existing models of Inmarsat-C and mini-C Maritime terminals on the market are Class 2 MESs.



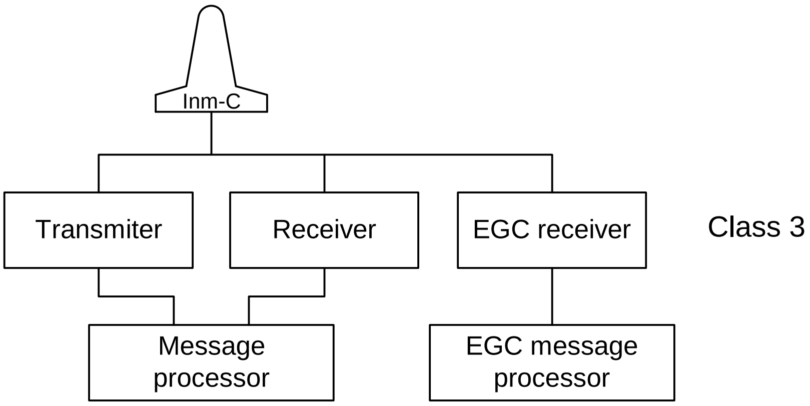


Figure 9 – Classes of Inmarsat-C Mobile Earth Stations

2.3 Type approval

The Inmarsat-C SDM presents the technical requirements and recommendations for an EGC receiver. These requirements must be satisfied before the equipment can be utilized in the Inmarsat system. Procedures for type approval by Inmarsat of a manufacturer's design are provided in a complementary document entitled Type Approval Procedures for Inmarsat-C and mini-C Ship Earth Stations published by Inmarsat.

3 General requirements

3.1 Mandatory capabilities

The mandatory capabilities of SafetyNET receivers for SOLAS applications are:

.1 Continuous reception of an NCS common channel and processing of the information according to the EGC message protocol; a Class 2 Inmarsat-C MES continuously receives the NCS common channel when not engaged in general communications;

.2 Automatic recognition of messages directed to fixed and absolute geographical areas and service codes as selected by the receiver operator or based upon input(s) from navigational equipment;

.3 SafetyNET receivers meet the requirements of IEC 61097-4 and IEC 60945; and

.4 Where automatic updates are not available, provision is made for a visual indication if the ship's position has not been updated during the last 12 hours. It is only possible to reset this indication by revalidating the ship's position.

4 NCS common channel selection

4.1 General

EGC receivers are equipped with facilities for storing up to 20 NCS channel numbers. Four of these are permanently assigned global beam channel numbers and frequencies as follows:

NCS	NSC common channel	
	Channel No.	Frequency
AOR-West	11080	1537.70 MHz
AOR-East	12580	1541.45 MHz
POR	12580	1541.45 MHz
IOR	10840	1537.10 MHz

These four channel numbers are stored in ROM and are not alterable.

4.2 NCS scanning

Automatic NCS scanning on a regular basis is prohibited in SOLAS SafetyNET receivers. In the event of low signal strength from the satellite, an alarm is raised and the operator is advised to initiate NCS scanning manually.

5 Message-processing requirements

5.1 General

Acceptance or rejection of the EGC service code types is under operator control except that receivers always receive navigational warnings; meteorological warnings, SAR information and To-Ships distress alerts which are directed to a fixed or absolute geographical area within which the receiver is situated.

5.2 Display devices

5.2.1 Message display

The display is capable of presenting at least 40 characters per line of text. The EGC receiver ensures that if a word cannot be accommodated in full on one line it is transferred to the next line.

5.2.2 Status display

An indication of EGC carrier frame synchronization (or loss of synchronization) is provided.

5.3 Printer requirements

A printer is required for a SOLAS SafetyNET receiver. Received EGC messages may be stored for later printing with an indication to the operator that the message has been received. However, distress or urgency priority calls are directly printed as well as stored. Means are also provided not to print or store the same EGC message after it has been received error-free and printed.

Messages are not printed until completely received.

A local audible alarm is sounded to give advanced warning of a printer "paper-low" condition.

All SafetyNET messages are annotated with the date and time (UTC) of reception. This information is displayed or printed with the message.

5.4 Character codes

For the EGC service, the International Reference Version of the International Alphabet 5 (IA5), also known as ASCII (a standard alphanumerical character set based on 7-bit codes) is used.

5.5 Operator control

The following control functions and displays are provided as a minimum:

.1 selection of EGC carrier frequency;

For SOLAS SafetyNET receivers:

.2 means of inputting the following information:

- **.1** MES's position co-ordinates;
- **.2** current and planned (additional) NAVAREA(s)/METAREA(s);
- **.3** current and planned coastal warning area (B_1 Code); and
- **.4** coastal warning subject indicator character (B_2 Code).

Receivers are fitted with operator controls to allow the operator to select desired geographical areas and message categories. Details of the geographical areas and message categories which have been selected for reception by the operator are readily available.

5.6 EGC receiver memory capacity requirements

Both temporary and non-volatile memory is required in an EGC receiver for the following purposes:

.1 message buffering;

.2 maintaining message identification records;

.3 storing position co-ordinates and NAVAREA(s)/METAREA(s) data; and

.4 storing expansion of NCS common channel numbers.

5.7 EGC receiver addressing

The five basic methods of addressing EGC receivers are:

.1 all-mobiles call;

.2 Inmarsat system message addressing;

.3 group addressing;

.4 unique addressing; and

.5 geographical area addressing including coastal addressing.

The type of address used in the header of an EGC packet is uniquely determined by the "C2" service code field.

5.8 Message identification

All messages are transmitted with a unique sequence number, originating LES ID and service code. Each subsequent transmission of the message contains the original sequence number. This facility allows multiple printing of repeated messages to be inhibited.

5.9 Geographical area addressing

Geographical area addressing refers to messages transmitted to MESs in a particular area. The area may be expressed in terms of a fixed, pre-defined area such as the NAVAREA/METAREA, or satellite coastal warning area, or in terms of an absolute geographical address expressed as latitude and longitude coordinates on the surface of the earth. An absolute geographical area address is a representation of a closed boundary on the surface of the earth given in the address field of the message header. The receiver recognizes two forms of absolute geographical addressing: rectangular and circular. Each form is specified in terms of an absolute position in latitude and longitude and further parameters that completely specify the boundary.

In order to process a geographical area address, the receiver shall be programmed with the MES's current position. The position may be entered automatically from an integrated or external navigation aid or entered manually. The receiver provides notification to the operator when the position has not been updated for four hours. If the MES's position has not been updated for more than 12 hours, or is unknown, all SafetyNET messages will be printed or stored in memory.

A geographical area address is considered valid for a particular MES if its current position falls inside or on the boundary specified by the address. It is a mandatory requirement that the operator be able to select more than one area, so that messages directed to other area(s) of interest can be provided. It is recommended that the operator be able to select at least four areas.

6 Link performance monitoring

The SafetyNET EGC receiver continuously monitors the received bulletin board error rate (BBER) as a measure of link performance whenever it is tuned and synchronized to a NCS (or LES) TDM. The receiver stores a count of the number of bulletin boards received in error out of the last 100 received. This count is continuously updated frame by frame.

7 Alarms and indications

The following alarms and indications are provided at a SOLAS SafetyNET receiver and meet the operational requirements for alarms stated in IEC 61097-4.

7.1 Distress/Urgency priority call alarm

For SOLAS SafetyNET receivers:

Provision is made for a specific audible alarm and visual indication at the position from which the ship is normally navigated to indicate receipt of SafetyNET messages with distress or urgency priority. It is not possible to disable this alarm and it is only possible to re-set it manually, and then only from the position where the message is displayed or printed.

7.2 Other alarms and indications

.1 High BBER;

.2 Printer paper low;

.3 Receiver fault indication;

.4 Loss of receiver synchronization; and

.5 Position update.

Additional alarms and indications may be provided at the manufacturer's discretion.

8 Electromagnetic compatibility

The interference and electromagnetic compatibility requirements of IEC 60945-applies.

9 Environmental conditions

SOLAS SafetyNET receivers shall operate satisfactorily under the environmental conditions specified in the SDM. The latest issues of IEC 61097-4 and IEC 60945 apply.

10 Navigational interface

In order that a receiver's position may be automatically updated, receivers may be equipped with an interface to navigational instruments. A suggested standard interface is in IEC 61162, Part 1 (NMEA 0183) Standard for Interfacing Electronic Marine Navigational Devices.

Note: The majority of modern maritime MESs have an integrated navigational receiver.

Annex 6

Procedure for amending the International SafetyNET Manual

1 Proposals for amendment or enhancement of the International SafetyNET Manual should be submitted to the IMO Maritime Safety Committee through the Sub-Committee on Radiocommunications and Search and Rescue.

2 Amendments to this Manual should normally come into force at intervals of approximately two years or at such longer periods as determined by the Maritime Safety Committee at the time of adoption. Amendments adopted by Maritime Safety Committee will be notified to all concerned, will provide at least 12 months' notification and will come into force on 1 January of the following year.

3 The agreement of the International Hydrographic Organization, International Mobile Satellite Organization, the World Meteorological Organization and the active participation of other bodies should be sought, according to the nature of the proposed amendments.

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Ref. T2-OSS/1.4

MSC.1/Circ.1365
24 May 2010

COMMERCIALLY AVAILABLE LOCATING, TRACKING AND EMERGENCY NOTIFICATION DEVICES

1 The Maritime Safety Committee (MSC), at its eighty-seventh session (12 to 21 May 2010), recognizing the recent proliferation of non-406 MHz locating, tracking and emergency notification devices and the challenges these devices present to SAR services, approved the information on the availability of commercially available locating, tracking and emergency notification devices and services, prepared by the Sub-Committee on Radiocommunications and Search and Rescue (COMSAR), at its fourteenth session, as set out in the annex.

2 Member Governments are invited to bring the annexed guidance to the attention of all parties concerned.

***

ANNEX

COMMERCIALLY AVAILABLE LOCATING, TRACKING AND EMERGENCY NOTIFICATION DEVICES

RECOGNIZING the recent proliferation of non-406 MHz locating, tracking and emergency notification devices, and

CONSIDERING the challenges these devices present to SAR services, ICAO and IMO wish to provide the following information to IMO Member Governments and ICAO Contracting States.

These commercially available locating, tracking and emergency notification devices are not compliant with internationally accepted performance standards and operational criteria for global distress alerting and therefore may be ineffective in emergency situations.

The following information may be made available to providers, users[1] and potential users of emergency notification devices by ICAO Contracting States and IMO Member Governments, and may be included in State public relations campaigns on the subject.

1 Users subject to IMO/ICAO regulations carry as a minimum a 406 MHz distress beacon that is compatible with the established international Cospas-Sarsat system and compliant with ICAO and IMO provisions.

2 Non-regulated users may, as a matter of choice and in lieu of a 406 MHz distress beacon, carry emergency notification devices. These devices, and the services offered in conjunction with them, should meet performance standards and operational criteria equivalent to 406 MHz beacons if they are expected to provide equivalent functionality.

3 If an emergency notification device or service falls short of these performance standards and operational criteria, transparency would require that the limitations are clearly indicated to the user by the manufacturer. These limitations may include, but not be limited to reduced, diminished or lack of:

.1 global coverage;

.2 timeliness of alert to the responsible SAR authority;

.3 location accuracy and homing signal;

.4 automatic activation and survivability in the aeronautical and maritime environments; and

.5 distressed user identifier capability.

---

1 The "provider" is the commercial operator marketing the emergency notification device or service. The "user" is the person buying/leasing the device or service.

4 In order to ensure seamless, timely and effective alert notification to the responsible SAR authority[2], States may require providers of non-406 MHz emergency notification devices and services to:

.1 establish and maintain a user database that can be correlated with the transmitted data;

.2 establish and maintain reliable contacts with relevant SAR authorities;

.3 agree to procedures and protocols with the State concerned, including but not limited to test procedures, provision of SAR and user data on demand, acceptable information format and efficient resolution of false alerts;

.4 demonstrate that they can alert the relevant SAR authorities 24/7/365 within 5 minutes of a confirmed distress situation, with positive confirmation of receipt by the responsible SAR authority; and

.5 demonstrate that they have robust processes and effective procedures for distribution of alert notifications. This would appropriately include training processes and backup systems to ensure resilience.

5 In order to give users a clear indication of actual effectiveness in emergency situations in specific areas, States may require providers of non-406 MHz emergency notification devices and services to provide potential users with a list of those States with which systemized arrangements have been made and in whose territories claims of coverage have been made.

___

[2] "SAR authority" is the organization with State-recognized responsibility for aeronautical, maritime and/or terrestrial response coordination. This includes a JRCC, ARCC, or MRCC as appropriate and if available.

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MSC.1/Circ.1367
24 May 2010

AMENDMENTS TO THE INTERNATIONAL AERONAUTICAL AND MARITIME SEARCH AND RESCUE (IAMSAR) MANUAL

1 The Maritime Safety Committee (MSC), at its eighty-seventh session (12 to 21 May 2010), having been informed that the International Civil Aviation Organization (ICAO) had approved the amendments to the IAMSAR Manual prepared by the ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue, and that they had been endorsed by the Sub-Committee on Radiocommunications and Search and Rescue (COMSAR) at its fourteenth session, approved the annexed amendments in accordance with the procedure laid down in resolution A.894(21).

2 The Committee decided that the amendments should become applicable on 1 June 2011.

***

ANNEX

SECTION I

AMENDMENTS TO IAMSAR MANUAL – VOLUME I

1 Abbreviations and Acronyms

- Add the following text on page vii:

AIS ………… Automatic Identification System
LRIT ……..... Long Range Identification and Tracking

- Add the following text on page viii:

SRS ………. Ship Reporting System
VMS ………. Vessel Monitoring System
VTS ………. Vessel Traffic Services

2 Glossary

- Add the following text on page ix:

Automatic Identification System (AIS) A system used by ships and vessel traffic services (VTS), principally for identifying and locating vessels.

Geographic Information System (GIS) A system which captures, stores, analyses, manages and presents data that is linked to location.

Long Range Identification and Tracking (LRIT) A system which requires certain vessels to automatically transmit their identity, position and date/time at 6-hour intervals in accordance with SOLAS regulation V/19-1.

Maritime Domain Awareness (MDA) The effective understanding of any activity associated with the maritime environment that could impact upon the security, safety, economy or environment.

Ship Reporting System (SRS) Reporting systems which contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. They are established under SOLAS regulation V/11 or for SAR purposes under chapter 5 of the International Convention on Maritime Search and Rescue, 1979.

Vessel Tracking A generic term applied to all forms of vessel track data derived from multiple sources such as ship reporting systems, AIS, LRIT, SAR aircraft, VMS and VTS.

Vessel Monitoring System (VMS) A tracking system which provides for environmental and fisheries regulatory organizations to monitor the position, time at a position, course and speed of commercial fishing vessels.

Vessel Traffic Services (VTS) A marine traffic monitoring system established by harbour or port authorities to keep track of vessel movements and provide navigational safety in a limited geographical area.

3 Chapter 2

- Add the following text in paragraph 2.3.7, Table, "Desired" column:

  - Vessel tracking information including: AIS, LRIT, VMS and SRS

- Add the following text in paragraph 2.7.2, at the end of first sentence after "search plan":

  - and gaining access to vessel tracking information such as AIS, LRIT, VMS used by fisheries and Ship Reporting Systems (SRS).

4 Chapter 3

- Add the following text in paragraph 3.2.11, at the bottom of second column:

  - Vessel tracking systems (AIS, LRIT, VMS)

5 Chapter 4

- Delete the last sentence on page 4-4 (a), which reads:

  - "Satellite beacons have demonstrated superior performance to those that alert on 121.5 MHz"

- Amend the title of paragraph 4.5.25 by adding after "Ship Reports for SAR":

  - "and Vessel Tracking"

- Add new paragraph after paragraph 4.5.26:

  "4.5.27 As well as ship reporting systems, other vessel tracking systems and services are valuable for search and rescue. AIS, LRIT, VMS and Vessel Traffic Services (VTS) are all valuable sources of vessel position data and can be displayed to provide a surface picture (SURPIC). The surface picture can assist in the identification and location of suitable rescue vessels and be used to locate potential rescue vessels. In accordance with SOLAS regulation V/19-1, Contracting Governments should make provision to receive LRIT vessel position data for SAR in accordance with applicable IMO guidance."

6 Chapter 5

- Add in paragraph 5.4.4, dash point 7, after "ship reporting systems":

  - and vessel tracking systems

7 Chapter 6

- Add in paragraph 6.5.3, after dash point 3, new dash point:

  "- provide access to ship reporting and vessel tracking systems (AIS, LRIT, VMS, VTS)"

8 Appendix C

- Add in paragraph C.5.2, third sentence, after "Ship reporting systems":

  "- and vessel tracking systems enable"

9 Appendix G

- Delete in paragraph G.6.1 the second dash point referring to Inmarsat-E.

- Reword G.6.1 to read:

  - Maritime Satellite Emergency Position Indicating Radio Beacons (EPIRBs) have been accepted into the GMDSS. These beacons operate on 406 MHz and may have a 121.5 MHz final homing signal. The signals are relayed via Cospas-Sarsat satellites, local user terminals (LUTs) and mission control centres (MCCs) to SAR Points of Contact (SPOCs) which include RCCs.

- Delete the second sentence of paragraph G.6.2.

- Delete in paragraph G.7.2, third sentence:

  - "A" and "E (E is the EPIRB)"; and

- Add in paragraph G.7.2, third sentence:

  - "Mini-C" and "F77".

SECTION II

AMENDMENTS TO THE IAMSAR MANUAL – VOLUME II

1 Content

- Add on page vii (new last appendix):

  - Appendix [X] Search Planning for 121.5 MHz Distress Beacon Alerts

2 Abbreviations and Acronyms

- Add the following text on page ix:

  "**AIS** ………. Automatic Identification System"

- Add the following text on page xi:

  "**LRIT** …….. Long Range Identification and Tracking"

- Add the following text on page xiii:

  "**SRS** ……… Ship Reporting System"

- Add the following text on page xiv:

  "**VMS** ……… Vessel Monitoring System
  VTS ……….. Vessel Traffic Services"

3 Glossary

- Add the following text on page xv:

  "**Automatic Identification System (AIS)** A system used by ships and vessel traffic services (VTS), principally for identifying and locating vessels.

  Geographic Information System (GIS) A system which captures, stores, analyses, manages and presents data that is linked to location.

  Long Range Identification and Tracking (LRIT) A system which requires certain vessels to automatically transmit their identity, position and date/time at 6-hour intervals in accordance with SOLAS regulation V/19-1.

  Maritime Domain Awareness (MDA) The effective understanding of any activity associated with the maritime environment that could impact upon the security, safety, economy or environment.

  Ship Reporting System (SRS) Reporting systems which contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. They are established under SOLAS regulation V/11 or for SAR purposes under chapter 5 of the International Convention on Maritime Search and Rescue, 1979.

Vessel Tracking A generic term applied to all forms of vessel track data derived from multiple sources such as ship reporting systems, AIS, LRIT, SAR aircraft, VMS and VTS.

Vessel Monitoring System (VMS) A tracking system which provides for environmental and fisheries regulatory organizations to monitor the position, time at a position, course and speed of commercial fishing vessels.

Vessel Traffic Services (VTS) A marine traffic monitoring system established by harbour or port authorities to keep track of vessel movements and provide navigational safety in a limited geographical area."

4 Chapter 1

- Add on page 1-4 to heading "Ship Reporting System":

"- and Vessel Tracking"

- Add new paragraph 1.3.6:

"1.3.6 As well as ship reporting systems (SRS), RCCs can use vessel position data from various vessel tracking systems to support SAR operations. These may include the Long-range Identification and Tracking (LRIT) system, the Automatic Identification System (AIS) system, fisheries and other Vessel Monitoring Systems (VMS) and Vessel Traffic Services (VTS) established to monitor port operations or to cover focal areas or sensitive areas. Data from each of these systems can be displayed by RCCs using Geographic Information Systems (GIS) to produce a surface picture (SURPIC). SURPICS can be used to identify and locate potential rescue vessels as well as improve maritime domain awareness (MDA). In accordance with SOLAS regulation V/19-1, Contracting Governments should make provision to receive LRIT vessel position data for SAR. In accordance with IMO guidance material, RCCs can request LRIT data for SAR operations within their own SRR and for SAR coordination requirements outside it as appropriate. Data on all vessels can be requested within a circular or rectangular area at no charge to the RCC."

- Add in paragraph 1.3.11, to final sentence:

"- and operate on 406 MHz and 121.5 MHz for final homing."

- Add in paragraph 1.8.15, to "Ship reporting systems for SAR":

"- and Vessel tracking (AIS, LRIT, VMS and VTS)"

- Add new paragraph after paragraph 1.11.9:

"1.11.10 *Display of Vessel Tracking Data*

A computer system with Geographic Information System (GIS) display capability is important for displaying vessel tracking data sourced from AIS, LRIT, VMS, VTS and other sources. The location of SAR Units can also be tracked and displayed, as can search areas and other information."

5 Chapter 2

- Delete in paragraph 2.6.1 the second dash point about Inmarsat-E.

- Reword the remainder of paragraph 2.6.1 to read:

  "- Maritime Satellite Emergency Position Indicating Radio Beacons (EPIRBs) have been accepted into the GMDSS. These beacons operate on 406 MHz and may have a 121.5 MHz final homing signal. The signals are relayed via Cospas-Sarsat satellites, local user terminals (LUTs) and mission control centres (MCCs) to SAR Points of Contact (SPOCs) which include RCCs."

- Amend second sentence of paragraph 2.6.3 as follows:

  "- Signals are also relayed via over flying aircraft and satellite from 121.5 and 243 MHz ELTs and EPIRBs, but signals from these beacons are not processed by satellites and are not ~~not specifically designed for satellite compatibility nor considered~~ part of GMDSS."

- Delete final sentence in brackets of paragraph 2.6.6.

- Delete whole paragraph 2.6.9.

- Renumber paragraph 2.6.10 as 2.6.9.

- Delete whole paragraph 2.6.11.

- Renumber paragraph 2.6.12 as 2.6.10.

- Delete in paragraph 2.7.6 at start of first sentence after the word Inmarsat:

  - "-A and" At the end of the last sentence, Delete: "and E (E is the EPIRB)" and Add after the letter "M" ", Mini-C and F77."

- Delete in paragraph 2.9.2 second sentence about Inmarsat-E.

- Amend in paragraph 2.9.4 the first sentence to read:

  "- Many civil aircraft worldwide, especially operating over ocean areas, carry an ELT which operates on 406 MHz for alerting and 121.5 MHz for final homing."

- Delete in paragraph 2.9.4, third sentence, the words:

  - "alert and", so that the sentence reads: "Many ELTs also provide homing signals on 243 MHz ..."

- Delete in paragraph 2.9.4 the final sentence.

- Amend in paragraph 2.9.7 the first sentence to read:

  "- When carried aboard vessels or other craft, EPIRBs can send signals on 406 MHz for alerting and 121.5 and 243.0 MHz for final homing."

- Delete in paragraph 2.9.7 the final sentence.

- Amend in paragraph 2.13.1 the end of the first sentence to read:

  "- … or a seven or nine digit identity for Inmarsat terminals."

- Delete in paragraph 2.13.1 the second last sentence.

- Add at the end of paragraph 2.13.2 the following:

  - MMSIs are also used in the AIS for vessels, base stations, aids to navigation, SAR aircraft and AIS SARTs. The various platforms can be differentiated by reference to the MMSI format and from databases.

- Add new paragraph after paragraph 2.32.4:

  "2.33 Vessel Tracking Communications

  Various forms of communication can be used for vessel tracking. Ship reporting systems can use voice reporting over VHF and HF, DSC and Inmarsat. Many ship reporting systems use Inmarsat-C polling or Inmarsat automated position reporting (APR). AIS uses a time-division multiple access (TDMA) scheme to share the VHF frequency, also known as the VHF Data Link (VDL). There are two dedicated frequencies used for AIS – AIS 1 (161.975 MHz) and AIS 2 (162.025 MHz). LRIT can employ any form of communication which meets the required functional specification, but most vessels use Inmarsat equipment to report every six hours to their Data Centre via a communications provider and application service provider. Vessel Monitoring Systems (VMS) can use various systems for tracking, including Inmarsat, Iridium and Argos."

6 Chapter 3

- Add in paragraph 3.5.3(b), second paragraph, after the words "ship reporting systems":

  - "and vessel tracking systems."

- Add in paragraph 3.5.9(c) a second sentence as follows:

  "- Check vessel tracking systems (AIS, LRIT, VMS, VTS) for vessels which may be able to assist."

7 Chapter 5

- Renumber existing subparagraph 5.6.4(b) as 5.6.4(c).

- Add new subparagraph 5.6.4(b):

  "5.6.4(b) When reports are received of detections of 121.5 MHz or 243 MHz from over flying aircraft (these signals are not processed by Cospas-Sarsat), a search area will need to be established so that an electronic search can be conducted for the beacon. Appendix **[X]** can be used for guidance on determining a search area and how that area should be searched."

8 Appendix B

- Delete on Page B-7 "Sample 121.5 MHz Initial Alert" and the format.

- Delete on Page B-10 "Inmarsat-E Format".

9 Add new last appendix:

Appendix R

Search Planning for 121.5 MHz Distress Beacon Alerts

1. Searching for beacons is often difficult, and may be impossible without additional information. However, the methods in this Appendix should be followed as practicable.

2. Search planning for 121.5 MHz beacon alerts typically result from reports received from commercial aircraft flying at high altitude. The beacon could be located anywhere within a large search area. Reports might also be received via low-flying aircraft and ground stations. The methods that follow will help define and reduce beacon search areas. Maximum detection ranges for beacon signals are assumed to be limited by line-of-sight.

3. Figure 1 depicts the geometry when an aircraft receives a beacon signal, and shows labelling used in planning a search for the beacon. *However, potential scenarios discussed in the cautionary notes below may limit the applicability of Figure 1 and should be taken into account when deemed appropriate.*

CAUTIONARY NOTES:

Only a single report and reporting aircraft location might be received. Unless the aircraft can provide additional information, the search area would have to be assumed to include the area within a single circle centred on the reporting aircraft's location.

Reports of *first heard* and *last heard* information may not be accurate. The person monitoring the radio may not immediately hear or recognize the 121.5 MHz distress beacon swept tone, causing the reported time and location to be incorrect.

- The beacon may have started transmitting after the reporting aircraft was already well within the maximum detection range, or the beacon may cease transmitting well before the aircraft is beyond the maximum detection range. Try to determine whether the signal: seemed strong when first acquired and then faded; was getting stronger and then abruptly ceased; or started suddenly, stopped suddenly, and seemed to be about the same strength the whole time it was heard. In such cases, the search planning procedure in this Appendix should still work, although the overlapping area where the two circles intersect will be enlarged; the centres of the circles would be closer together than they would be if signal acquisition and loss were solely due to the reporting aircraft coming within and then moving beyond maximum detection range while the beacon was transmitting.

- As a part of the report data gathering process it should also be ascertained that the receiving radio was already on (did not receive the signal when it was first turned on) and that detection of the signal did not occur while squelch was being adjusted. These situations may occur when seeking reports from additional aircraft when they first turn on or adjust their radios to listen. In such cases, the position for the last heard point could be more useful that the position of when the beacon was first heard.

Reports from a single aircraft may occur at different altitudes or courses. Aircraft, particularly those under instrument flight rules, may be ascending, descending and/or changing course according to their flight plan and air route traffic control needs. The first heard and last heard reports could be from different altitudes or on different courses. For a course change, knowing the turn point would allow drawing another range circle to combine with the first heard and last heard generated range circles to more narrowly define the area. When the reports occur at different altitudes, range circles should be drawn for each altitude to identify their intersect points.

The transmitting beacon antenna may have some height above sea level or above its surrounding terrain. The height of the sending antenna should be added to the height of the radio receiver when estimating the detection range.

In areas involving an island, the island should be considered as a possible forced landing site. The first heard and last heard positions may be affected by the forced landing site's altitude and the terrain surrounding the site, which could block the signal in some directions.

The radio horizon range circle may cross land. The altitude of the reporting aircraft should be assumed to be the aircraft altitude above that elevation of the terrain at the lowest land horizon rather than above sea level, as discussed below in this Appendix.

The detected beacon may be aboard an in-flight aircraft, and the aircraft, course, speed or altitude could change. The procedures in this Appendix do not account for an in-flight beacon scenario, but the search planner should be aware that apparently conflicting data or unexpected search planning outcomes could be caused by this situation.

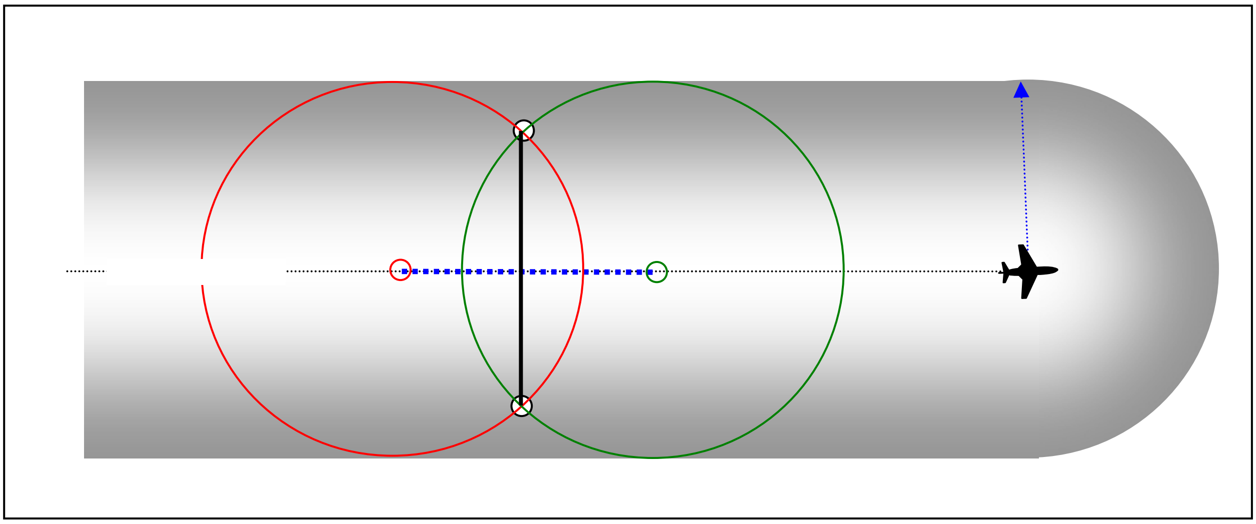


Figure 1 – Geometry where reporting aircraft passes within reception range of beacon signal

SEARCH PLANNING PROCEDURE

4. **Record reported data.** Use Table 1 to record data received about a transmitting 121.5 MHz beacon. Of all data collected about the beacon signal, the position and height of the receiving antenna for points first heard (PFH) and last heard (PLH) are most important.

Note: Obviously, reports from multiple sources can help substantially in narrowing down the search area for a 121.5 MHz beacon. The SAR Mission Coordinator (SMC) should use all reports, and also solicit additional reports from other aircraft in the area, either directly or via the appropriate flight services as appropriate. Aircraft should be asked to report their own altitudes and positions where the signal was first heard, when the maximum signals were heard, and when the signal faded or was lost. Flight services, communications authorities, maritime SAR authorities or others might also be able to obtain fixes or bearings on activated beacons. When receiving multiple reports, consider the possibility that more than one activated 121.5 MHz beacon might be heard. The authorities might also be able to help locate and silence an inadvertently activated beacon.

Point	Date-Time	Position (lat/long)	Aircraft Altitude (h) (ft)	Course (degrees true)
PFH (first heard)		N/S E/W		
PLH (last heard)		N/S E/W		

Table 1 – 121.5 MHz beacon alert report data

5. **Plot the reporting aircraft track.** Use a rhumb line or great circle navigation depending on the track being followed by the reporting aircraft, as depicted in Figure 2.

NOTE: The geographic area used as an example in Figures 2, 3, 4, 5, 8 and 10 is Hawaii and the surrounding area. The illustration shows a Lockheed C-130 search aircraft from Air Station Barbers Point in response to a report from an aircraft at high altitude, but similar plots could be developed for any area and other situations.

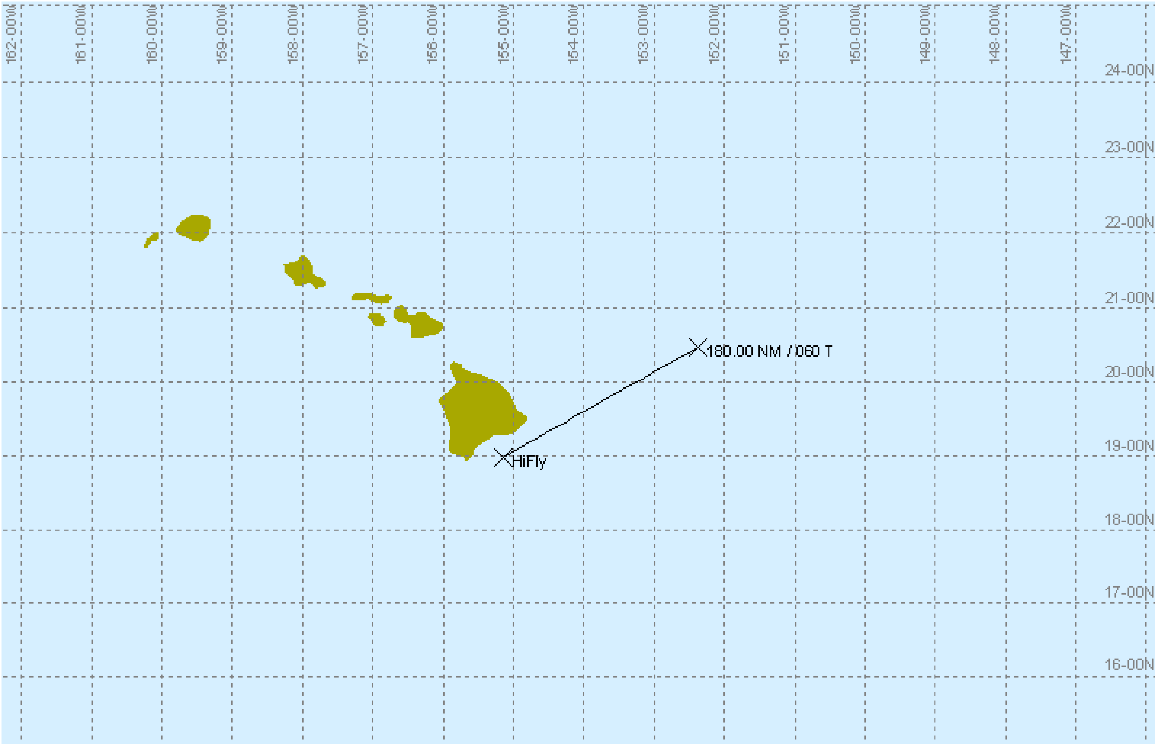


Figure 2 – Plot of PFH and PLH

6. **Plot the radio horizons.** Compute and plot the distance to the radio (VHF/UHF) horizon for the reporting aircraft at PFH and PLH.

a. The radio horizon distance is estimated using Table 3 at the end of this appendix or by using the following equation:

$$d = 1.23 \times \sqrt{h}$$

Where:

h is the antenna height in feet above the water (e.g., mean sea level) or above ground level (AGL); and

d is the Radio Horizon Distance (reception range) for the reporting aircraft in nautical miles (nm).

b. Use Table 3 and its associated equations to determine the radio range to the horizon from a receiving antenna at various altitudes, where the altitude is measure above Mean Sea Level (MSL) in oceanic environments. If the elevation of the horizon varies in different directions from the aircraft, perfect circles will not accurately represent the potential areas containing the beacon. The conservative approaches are as follows:

- When the horizon is only partly over an oceanic area, plot a circle using altitude above MSL;

- When the horizon is entirely over land, use the Above Ground Level (AGL) altitude, where AGL is the altitude of the reporting aircraft above the elevation of the horizon at its lowest point; and

- Be aware that over jungle areas, mountainous terrain, or where similar signal obstructions exist, the radio detection range may be as little as one-tenth of the horizon range (in mountainous terrain or areas covered with dense vegetation, the range of the signal will be reduced considerably compared to the range over water or flat land as discussed in the IAMSAR Manual, Volume 2, Section 5.6).

c. Record the results in Table 2 below.

Point	Aircraft Altitude (h) (ft)	Radio Horizon Distance (*d*) (nm)
PFH		
PLH		

Table 2 – Radio horizon distance

d. Draw circles centred on the PFH and PLH with a radius equal to the computed radio horizon distance for each point at the given altitude for each as recorded in Table 2 (shown in Figure 3).

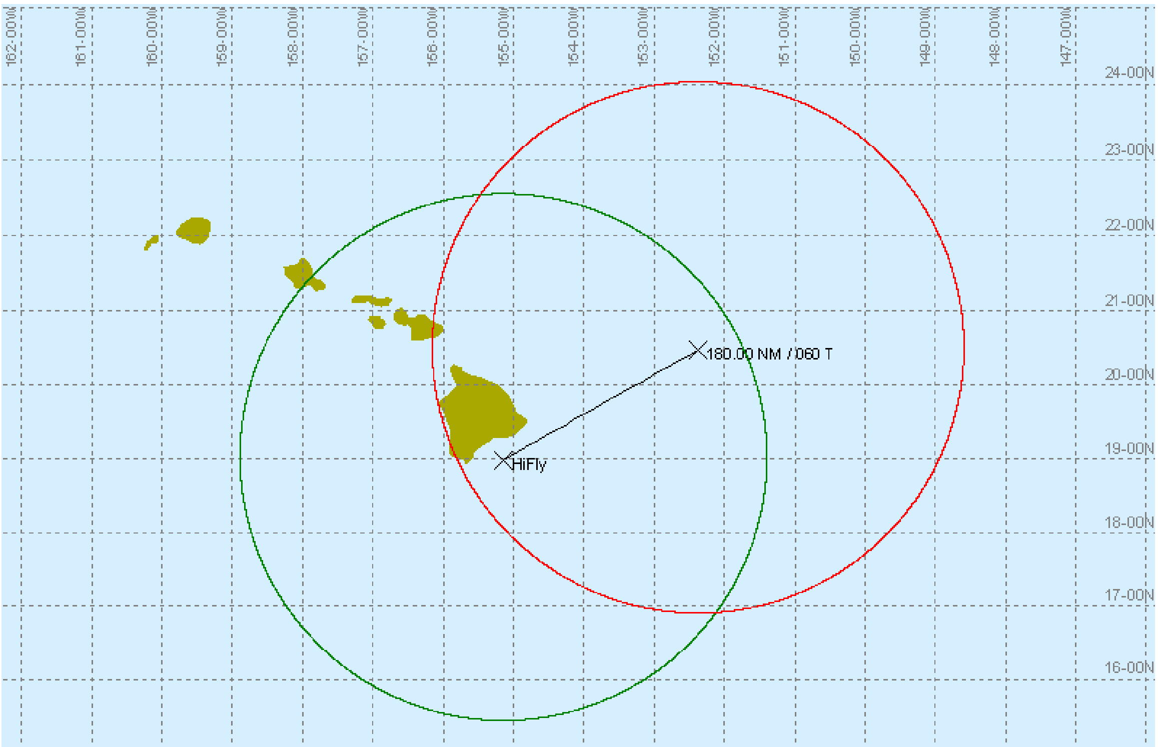


Figure 3 – Plot of computed radio horizon distances for PFH and PLH

7. **Plot the intersect line.** The circles should intersect in two places. Draw a line between the two points where the circles intersect. This line will bisect the line connecting PFH and PLH positions as indicated in Figure 4.

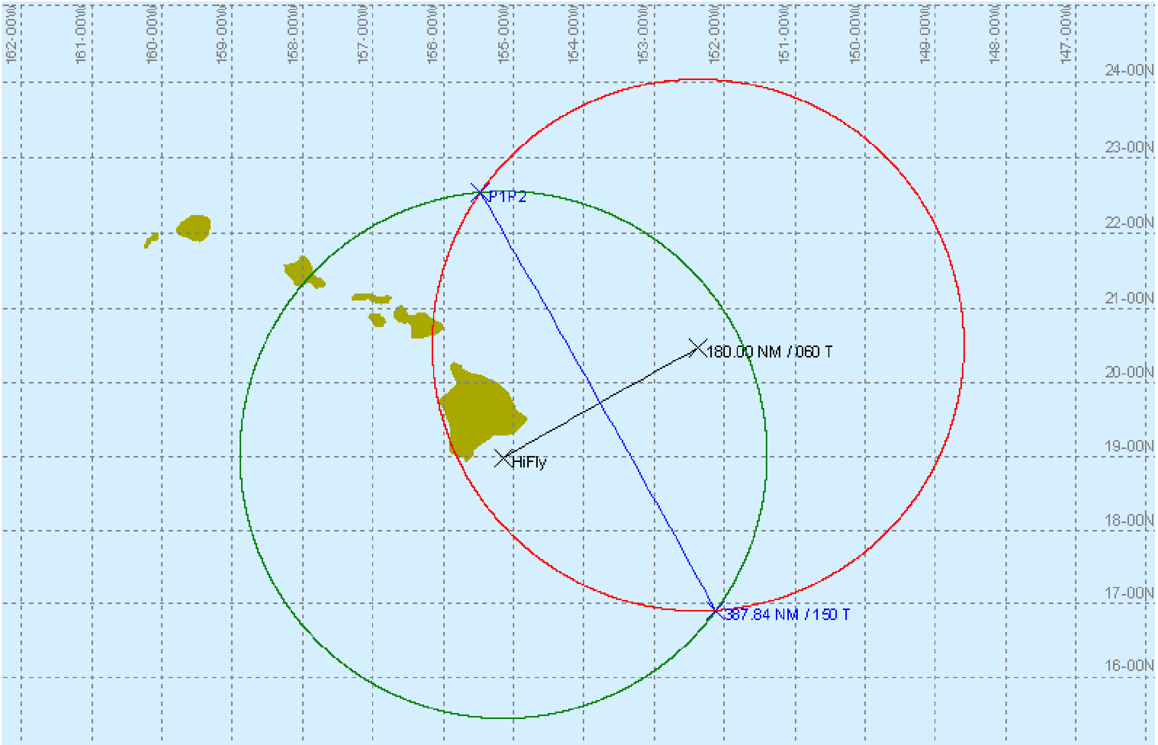


Figure 4 – Plot of the intersect line

8. **Plan the search.** With only a single report from a high-flying aircraft and the associated long distances, large search areas will result and search options will be limited.

a. Generally, with a single report, an electronic search will be needed to attempt to reacquire and home on the beacon signal. An electronic search can often be accomplished reasonably fast with a single aircraft SAR unit (SRU) search track.

b. The aircraft SRU should proceed to the nearest point where the two circles intersect and then fly at a high altitude to the other point where the two circles intersect as illustrated in Figure 5. This should allow the beacon signal to be detected so the SRU can home on it.

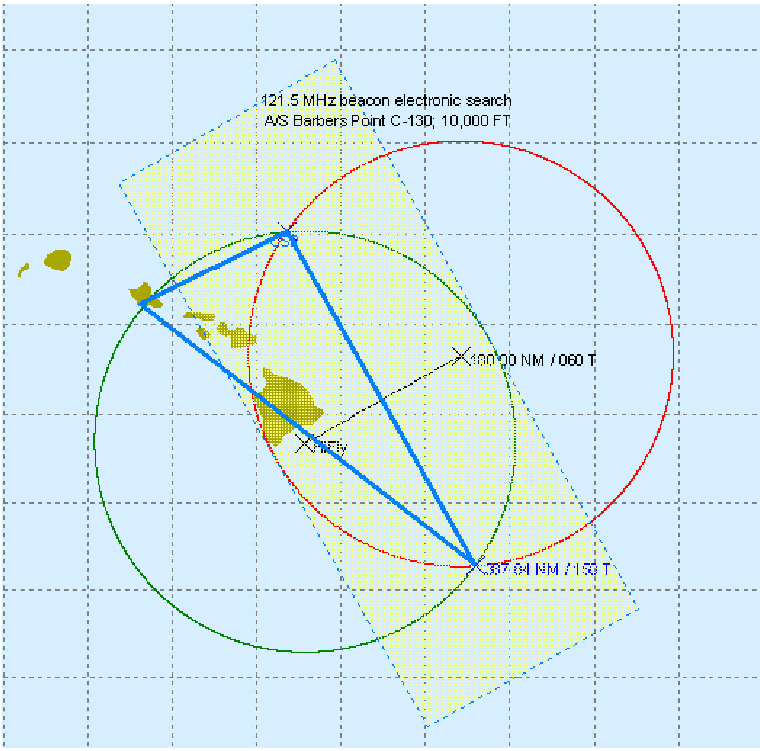


Figure 5 – Aircraft SRU search down the intersect line at an altitude of 10,000 feet with a radio horizon range of 123 nm

NOTE: The other two blue legs are flight from the base to commence search point (CSP) and also return to base from the second intersection point/end of the intersect line.

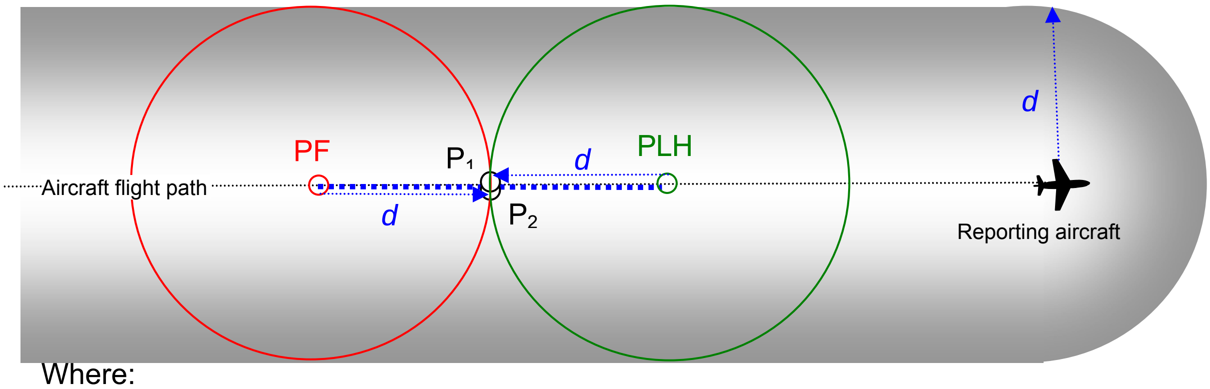
c. The area where the two circles overlap could also be covered with a multi-leg track line pattern. This might be necessary if the maximum altitude of the SRU limits its detection range to less than half the width of the overlapping area of the two circles. A parallel sweep or creeping line search pattern could also be used as discussed in Section 5.6 of this Volume of the IAMSAR Manual.

9. **Reporting aircraft position.** When the reporting aircraft passes directly over or nearly over the beacon position as shown in Figure 6, the search aircraft may proceed along the reporting aircraft's trackline. This special case is indicated when the distance over which the beacon was heard is twice (or nearly so) the radio horizon distance ***d***. However, if the reporting aircraft was not near the beacon position and the search aircraft's altitude is substantially lower than the reporting aircraft's altitude, a simple trackline electronic search may provide inadequate coverage to detect the beacon signal.

a. As shown in Figures 7 and 8, with the reporting aircraft at 30,000 feet and the search aircraft at 10,000 feet, two primary locations would be missed by a search along the reporting aircraft's track; even a search at 20,000 feet would not cover the entire area.

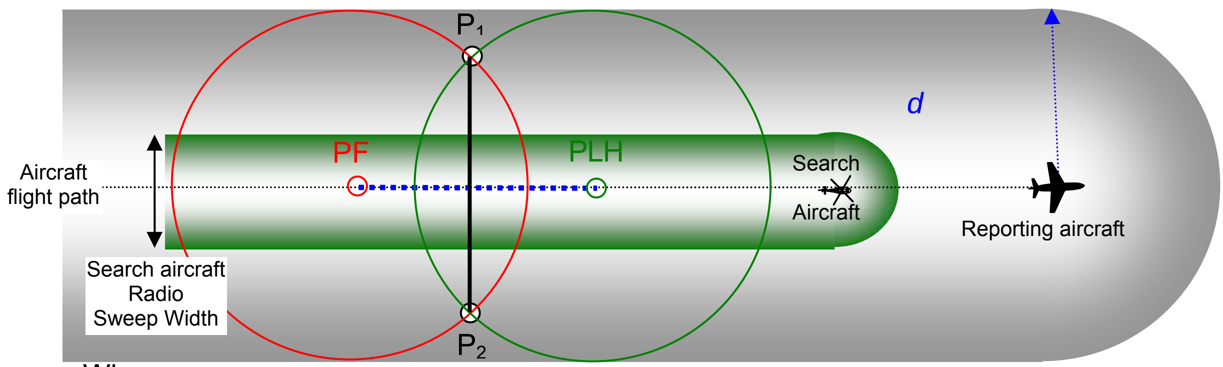
b. In most situations it would be best to search along the intersect line (Figures 5 and 9), with the search aircraft at 10,000 feet.

c. If searching along and perpendicular to the track does not succeed, a decision will be needed on if conducting a multiple leg track search is warranted based on all available information.



Where:
PFH = point first heard
PLH = point last heard
d = horizon distance for radio reception at a given height of antenna (aircraft altitude)
P_1 = Intersect position one
P_2 = Intersect position two

Figure 6 – Basic geometry for special case where reporting aircraft passes directly over the beacon position



Where:
PFH = point first heard
PLH = point last heard
d = horizon distance for radio reception at a given height of antenna (aircraft altitude)
P_1 = Intersect position one
P_2 = Intersect position two

Figure 7 – Search aircraft at lower altitude than reporting aircraft – same track; beacon signal not heard

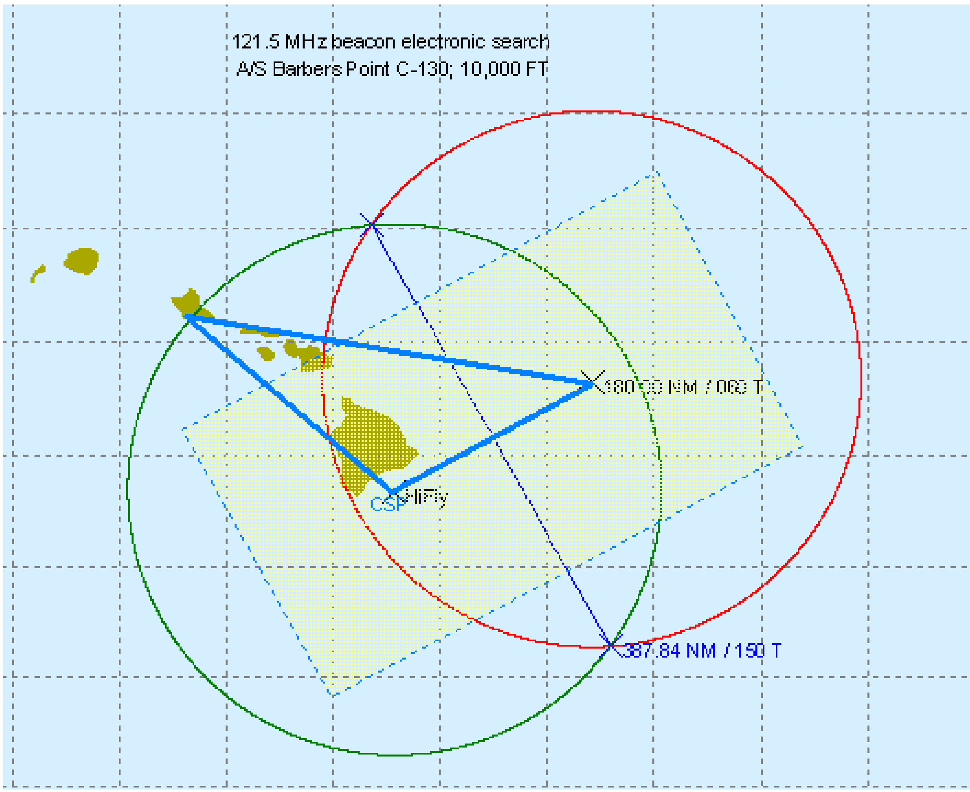


Figure 8 – Search aircraft at 10,000 feet, reporting aircraft at 30,000 feet – same track; beacon signal not heard

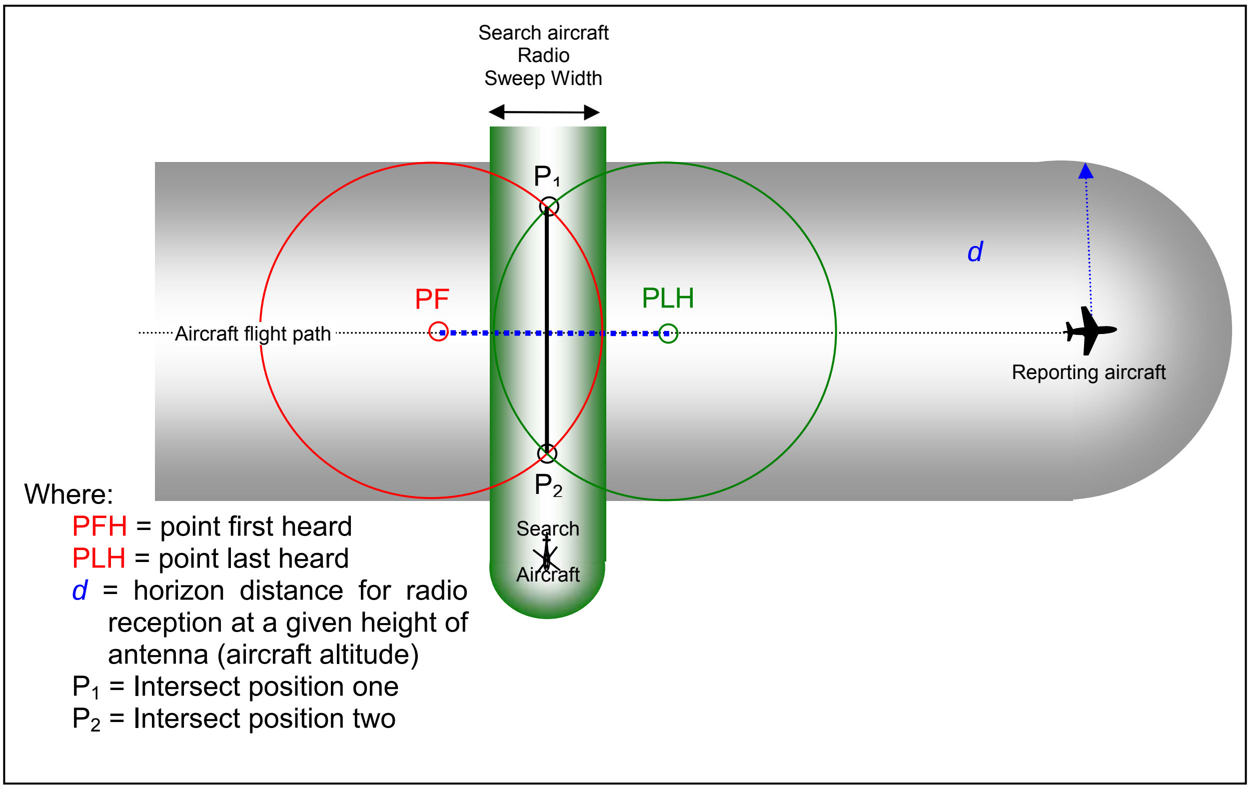


Figure 9 – Searching the intersect line by search aircraft at lower altitude than the reporting aircraft

10. **Visual search.** If no beacon signal is detected by the search aircraft conducting an electronic search or by other high-flying aircraft, a visual search will usually be impractical based on a single report. A visual search may be practical when the report comes from a low-flying aircraft which results in a smaller search area. If no other information is available besides a single report, the SMC should follow the SAR agency's guidance for responding to uncorrelated reports.

11. **Multiple Reports.** Multiple reports make it easier to reduce the area of the probable location for the distress beacon. (This situation is very similar to uncorrelated distress calls on VHF-FM and the reception by multiple radio towers (without direction finding).)

a. Plot each report; identify the intersections and areas of overlap of the pairs of radio horizon circles; and, eliminate those areas not covered by the multiple reports.

b. Figure 10 shows a plot of reports from two aircraft. The first report is from an aircraft at 30,000 feet on a course of 060 degrees T, and the second report is from a descending aircraft on a course of 242 degrees T from 20,000 feet to 10,000 feet when the signal is last heard. (The smaller search area in this case would reduce the search time needed for an electronic search and could result in a reasonable visual search.)

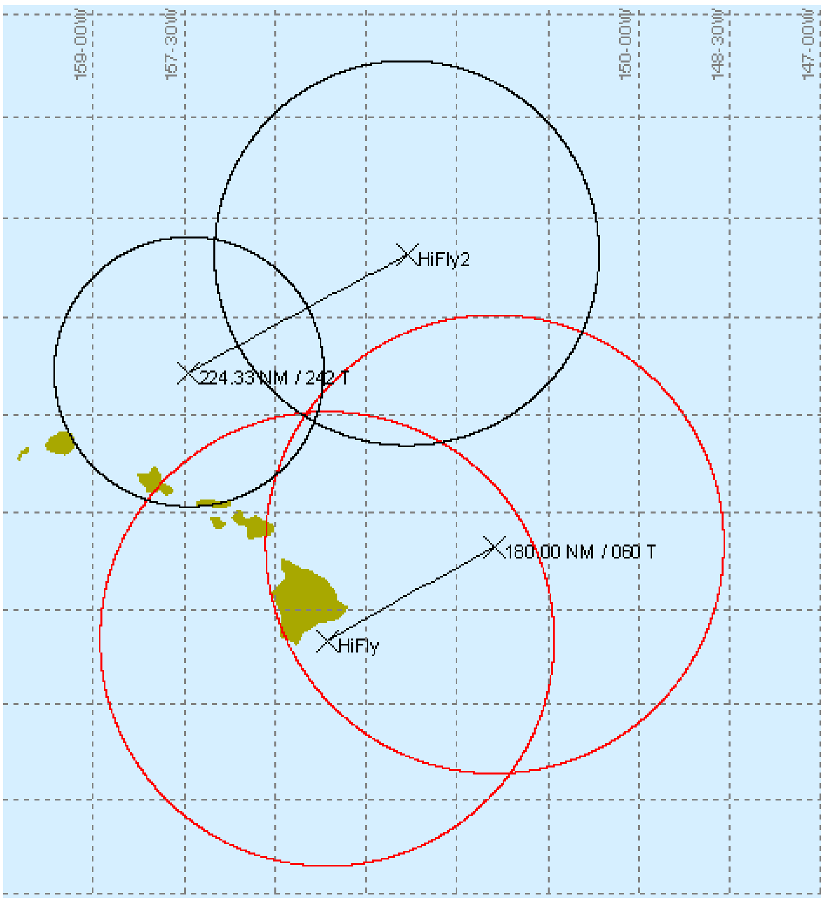


Figure 10 – Plot of PFH, PLH and respective radio horizon range circles; Hifly at 30,000 feet and course of 060 degrees T; Hifly2 at 20,000 feet and descending to 10,000 feet and course of 242 degrees T

Altitude in feet	Radio distance in nautical miles	Altitude in metres	Radio distance in kilometres
500	28	152	52
1,000	39	305	72
2,000	55	610	102
3,000	67	914	124
4,000	78	1,219	145
5,000	87	1,524	161
6,000	95	1,829	176
7,000	103	2,134	191
8,000	110	2,438	204
9,000	117	2,743	217
10,000	123	3,048	228
11,000	129	3,353	239
12,000	135	3,658	250
13,000	140	3,962	259
14,000	146	4,267	271
15,000	151	4,572	280
16,000	156	4,877	289
17,000	160	5,182	297
18,000	165	5,486	306
19,000	170	5,791	315
20,000	174	6,100	322
21,000	178	6,400	330
22,000	182	6,706	337
23,000	187	7,010	347
24,000	191	7,315	354
25,000	195	7,620	361
26,000	198	7,925	367
27,000	202	8,230	374
28,000	206	8,534	382
29,000	210	8,839	389
30,000	213	9,150	395
31,000	217	9,450	402
32,000	220	9,754	408
33,000	223	10,058	413
34,000	227	10,363	421
35,000	230	10,668	426
36,000	233	10,973	432
37,000	237	11,278	439
38,000	240	11,582	445
39,000	243	11,887	450
40,000	246	12,192	456

Table 3 – Distance to Radio Horizon

SECTION III

AMENDMENTS TO THE IAMSAR MANUAL – VOLUME III

1 Glossary

- Amend the following text on page xi:

  Cospas-Sarsat System A satellite system designed to detect distress beacons transmitting on the ~~frequencies of 121.5 MHz and~~ frequency of 406 MHz

2 Section 1

- Amend on page 1-4, the heading "Ship Reporting Systems" to read:
  - Ship Reporting Systems and Vessel Tracking
- Add on page 1-4, new dot point:
  - Automatic Identification System (AIS) and Long Range Identification and Tracking (LRIT) transmissions are also important for providing shore authorities with vessel tracking data to support search and rescue.

3 Section 2

- Amend on page 2-2, the first two entries at the top as follows:
  - maintain a continuous watch on the associated distress frequencies, if equipped to do so:
    - ~~500 kHz (radiotelephony)~~
    - 2182 kHz (radiotelephony)
    - 156.8 MHz FM (Channel 16, radiotelephony) for vessel distress
    - 121.5 MHz AM (radiotelephony) for aircraft distress
  - ~~After 1 February 1999~~, Vessels subject to the SOLAS Convention must comply with applicable equipment carriage and monitoring requirements
- Delete on page 2-53, second dot point:
  - "500 kHz"

4 Section 3

- Delete on page 3-11, in table, Alerting frequencies:
  - "Inmarsat-E EPIRB 1644.3-1644.5 MHz (earth to space)"
- Delete on page 3-11, in Maritime Safety Information (MSI) row:
  - footnote 8 on 490[8] kHz

- Renumber footnote 9 as number 8 (4209.5 kHz[8])

- Delete on page 3-12, at the bottom of the page:

  - "[8] Frequency 490 kHz cannot be used for MSI employing NBDP transmission until 1 February 1999"

- Renumber footnote 9 as 8

- Delete on page 3-13:

  - "*" from the 490.0 kHz* entry in the Table; and

  - its entire associated footnote shown as the second line from bottom of the page ("* For use after full implementation of GMDSS (1 February 1999).")

- Amend on page 3-13, second row from bottom of table "406.025" to read:

  - 406.0-406.1 band

- Delete on page 3-37, last dot point:

  - "L-band is used for Inmarsat-E EPIRBs"

- Delete on page 3-38, first bullet from the top:

  - "500 kHz (telegraphy)"

- Amend on page 3-38, second bullet from the top:

  - Many civil aircraft worldwide, especially operating on international flights and over ocean areas, carry ~~a 121.5 MHz ELT for alerting and homing~~ the 406 MHz distress beacon for alerting and homing. Some national regulations may allow for 121.5 MHz distress beacons on domestic flights.

    - o SAR aircraft should be able to home on~~on this frequency to locate survivors~~ the 121.5 MHz homing frequency on the 406 MHz distress beacon, and the capability exists to home on the 406 MHz signal itself.

    - o ~~an increasing number of ELTs use 406 MHz alerting signals with 121.5 MHz or 243.0 MHz or both for homing signals.~~

- Add on page 3-38, a new bullet 3 from the top:

  - EPIRBs and ELTs operate on the 406 MHz frequency and are required to be carried on board certain vessels and aircraft, respectively. The 406 MHz PLB is not required internationally but can be carried on a person.

- Amend on page 3-38, third bullet (which becomes bullet 4):

  - 406 MHz ~~ELTs and 406 MHz and Inmarsat E satellite EPIRBs~~ distress beacons (ELTs, EPIRBs and PLBs) offer coded identities and other advantages which can reduce SAR response time by up to several hours over what would be possible with non-coded ELTs beacons.

- Amend on page 3-38, fourth bullet (which becomes bullet 5):

  - ~~After January 1999:~~ Additional capability on board vessels:

- Amend on page 3-38, fourth bullet (which becomes bullet 5), second sub-bullet:

  - Ships of 300 gross tons and over are not ~~will no longer be~~ required by SOLAS to carry radio apparatus for survival craft capable of transmitting and receiving on ~~500 kHz (telegraphy)~~ 2182 kHz (telephony), but ~~these frequencies~~ this frequency can be expected to still be used.

- Amend on page 3-39, first bullet entry at the top of the page as follows:

  - ~~EPIRB~~ Distress beacon (ELT and EPIRB) signals indicate that a distress exists and facilitate location of survivors during SAR operations. To be effective, searching craft should be able to home on signals intended for this purpose, or on the alerting frequency itself (which will be non-continuous if it is 406 MHz).

5 Section 4

- Amend on page 4-3, first full bullet entry at the top of the page as follows:

  - Use any one or more of the following international maritime distress frequencies to transmit a distress call:

    - ~~500 kHz (radio telegraphy), the use of which will be phased out when GMDSS is implemented~~

    - 2182 kHz (radiotelephony)

    - 156.8 MHz FM (VHF, channel 16)

      - o any distress transmissions on the frequency ~~500 kHz or~~ 2182 kHz could be preceded by ~~the appropriate~~ a digital selective call

      - o in remote oceans areas, the distress call should also be transmitted on a ship-to-shore HF circuit to a CRS, especially when distress calls on ~~500 kHz~~, 2182 kHz, or channel 16 are not replied to by other stations.

- Amend on page 4-4 and page 4-5, the entire sub-section called "EPIRBS and ELTs" as follows:

  - **EPIRBs ~~and ELTs~~, ELTs and Personal Locator Beacons (PLBs) Distress Beacons**

    - EPIRBs ~~and ELTs~~, ELTs and PLBs are another means of alerting. They are distress beacons intended for alerting when other available means of alerting are inadequate.

- **EPIRB**: An EPIRB transmits a signal that alerts SAR authorities and allows rescue facilities to home in on the distressed vessel.

  - o activated automatically upon exposure to the sea, or manually

  - o 406 MHz EPIRB for use with Cospas-Sarsat satellites and is required on board certain vessels

  - ~~o types of maritime satellite EPIRBs:~~
    ~~406 MHz satellite EPIRBs whose signals are relayed via Cospas-Sarsat satellites InmarsatE EPIRBs whose signals are relayed via Inmarsat satellites~~
    ~~Non satellite VHF EPIRBs on channel 70, used close to shore in lieu of satellite EPIRBs where receiving stations are available.~~

    - **ELT**: Most civil aircraft carry one of two types of ELT to alert SAR authorities to a distress situation.

      - o 406 MHz ~~satellite~~ ELT ~~intended~~ for use with Cospas-Sarsat satellites and is required on aircraft on international flights

      - o 121.5 MHz ELT might be allowed on domestic flights and is intended to be heard by ~~high flying~~ other aircraft.

    - **PLB**: The 406MHz PLB is not a mandated international carriage requirement, but may be carried on a person and has similar characteristics to EPIRBs and ELTs. However, the PLB has different specifications.

    - Cospas-Sarsat calculates the position information for ~~EPIRBs and ELTs~~ the 406 MHz distress beacons.

    - Most ELTs and EPIRBs provide homing signals on 121.5 MHz; some also use 243 MHz, and some EPIRBs may also integrate SARTs into their designs.

    - Most EPIRBs and all ELTs are designed to activate automatically when a vessel sinks or an aircraft crashes (EPIRB alerts may indicate whether the beacon was activated automatically or manually).

    - Some ELTs and EPIRBs may also have integral GPS capabilities.

    - ~~Inmarsat-E EPIRBs transmit messages via Inmarsat geostationary satellites and CESs to RCCs. These beacons have registered coded signal identities.~~

    - ~~Position information from InmarsatE EPIRBs is derived either from integral equipment such as GPS, or via interfaces with shipboard navigation equipment (positions~~

~~from shipboard equipment cannot be updated after the EPIRB floats free).~~

- ~~InmarsatE EPIRB operates only within Inmarsat's coverage area, generally between 70 latitude north and south.~~

- It is recommended that an activated EPIRB, even if inadvertently activated (false alarm), be kept on until the RCC is informed.

  o This enables the RCC to work with a more accurate position and identification, allowing resolution of the alert without dispatching SAR facilities needlessly.

  o Immediately attempt to notify the RCC by other means that the alert is false.

- Add on page 4-29, new section as follows:

■ 121.5 MHz Distress Beacon Alerts

- 121.5 MHz distress beacons are still in use and send out distress alerts heard on the radio as a WOW WOW sound of two alternating tones.

- Aircraft in flight are the primary means of detecting these alerts. Pilots-in-command should advise ATS units when this distress alert is heard.

- When in flight and reporting an alert from a 121.5 MHz distress beacon, the pilot-in-command should expect the ATS unit to request the following information:

  - Your aircraft altitude above ground level, where and when the signal was first heard

  - Your aircraft altitude above ground level, where and when maximum signal was heard

  - Your aircraft altitude above ground level, where and when signal faded or was lost.

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Ref. T2-OSS/1.4

MSC.1/Circ.1366
24 May 2010

MEDICAL ASSISTANCE AT SEA – YACHT RACING

1 The Maritime Safety Committee (MSC), at its eighty-seventh session (12 to 21 May 2010), approved the attached Guidance on the issue of medical assistance at sea with respect to yacht racing. The guidance contains recommendations for the organization of medical assistance for offshore racing to ensure that the telemedical assistance service (TMAS) can provide the best possible telemedical assistance together with the MRCC in charge of a SAR operation.

2 Member Governments are invited to bring the information to the attention of all parties concerned.

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ANNEX

"MEDICAL ASSISTANCE AT SEA – YACHT RACING"

Offshore and oceanic yacht races

A race organizer when appropriate should, in addition to supplying relevant SAR authorities in advance of the event with details of a race including the dates, the course, the boats, their equipment and the crews, also supply:

- to a telemedical assistance service (TMAS) or inform a TMAS that the organizers have available on demand the following information:

for each boat:

- a list of medicines and medical equipment
- details of any TMAS or private medical service arranged by the boat

for each crew member:

- name and contact details of physician who certified the person fit for the race
- name and contact details of the crew member's home physician
- method for gaining quick access to medical records if necessary
- details of first aid and medical training received.

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MSC.1/Circ.1351
15 June 2010

INTERPRETATION OF STOWAGE AND SEGREGATION REQUIREMENTS FOR BROWN COAL BRIQUETTES AND COAL RELATED TO "HOT AREAS" IN THE IMSBC CODE

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), noting that the provisions of the IMSBC Code may be applied from 1 January 2009 on a voluntary basis and are envisaged to become mandatory under the SOLAS Convention on 1 January 2011, recognized the need for clarification of the following stowage and segregation requirements:

.1 "This cargo shall not be stowed adjacent to hot areas." in paragraph 5 in the section for "STOWAGE & SEGREGATION" in the appendix to the individual schedule for BROWN COAL BRIQUETTES; and

.2 "The master shall ensure that this cargo is not stowed adjacent to hot areas." in paragraph 4 in the section for "Segregation and stowage requirements" in the appendix to the individual schedule for COAL.

2 The Committee agreed that the words "adjacent to hot areas" in these provisions should be interpreted as "boundary areas of the cargo hold in contact with the cargo, having a temperature consistently greater than 55°C during carriage of the cargo, such as can sometimes be experienced when heated fuel oil service tanks and fuel oil settling tanks have a common boundary with the cargo hold".

3 The Committee recommends that, in applying the aforementioned interpretation, the following is taken into account:

> "Heated fuel oil tanks adjacent to cargo spaces carrying these cargoes should not normally be considered as "hot areas" when the fuel oil temperature is controlled at less than 55°C; this temperature is not exceeded for periods greater than 12 hours in any 24-hour period; and the maximum temperature of the fuel oil reached does not exceed 65°C."

4 Member Governments are invited to use the aforementioned interpretation as guidance when applying the provisions of the IMSBC Code and to bring it to the attention of all parties concerned.

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ANNEX 2

DRAFT MSC CIRCULAR

AMENDMENTS TO THE CODE OF SAFE PRACTICE FOR CARGO STOWAGE AND SECURING (CSS CODE)

1 The Maritime Safety Committee, at its [eighty-seventh session (12 to 21 May 2010)], approved amendments to the Code of Safe Practice for Cargo Stowage and Securing (CSS Code), set out in the annex.

2 Member Governments are invited to bring the annexed Amendments to the CSS Code to the attention of shipowners, ship operators, shipmasters and crews and all other parties concerned and, in particular, encourage shipowners and terminal operators to:

.1 apply the annexed amendments in its entirety for containerships, the keels of which were laid or which are at a similar stage of construction on or after 1 January 2015;

.2 apply sections 4.4 (Training and familiarization), 7.1 (Introduction), 7.3 (Maintenance) and section 8 (Specialized container safety design) to existing containerships, the keels of which were laid or which are at a similar stage of construction before 1 January 2015; and

.3 apply the principles of this guidance contained in sections 6 (Design) and 7.2 (Operational procedures) to existing containerships as far as practical by the flag State Administration with the understanding that existing ships would not be required to be enlarged or undergo other major structural modifications as determined.

ANNEX

AMENDMENTS TO THE CODE OF SAFE PRACTICE FOR CARGO STOWAGE AND SECURING (CSS CODE)

1 The following new annex 14 is inserted after the existing annex 13:

"ANNEX 14

GUIDANCE ON PROVIDING SAFE WORKING CONDITIONS FOR SECURING OF CONTAINERS ON DECK

1 AIM

To ensure that persons engaged in carrying out container securing operations on deck have safe working conditions and, in particular safe access, appropriate securing equipment and safe places of work. These guidelines should be taken into account at the design stage when securing systems are devised. These guidelines provide shipowners, ship builders, classification societies, Administrations and ship designers with guidance on producing or authorizing a Cargo Safe Access Plan (CSAP).

2 SCOPE

Ships which are specifically designed and fitted for the purpose of carrying containers on deck.

3 DEFINITIONS

3.1 *Administration* means the Government of the State whose flag the ship is entitled to fly.

3.2 *Fencing* is a generic term for guardrails, safety rails, safety barriers and similar structures that provide protection against the falls of persons.

3.3 *Lashing positions* include positions:

- in between container stows on hatch covers;
- at the end of hatches;
- on outboard lashing stanchions/pedestals;
- outboard lashing positions on hatch covers; and
- any other position where people work with container securing.

3.4 *SATLs* are semi-automatic twistlocks.

3.5 *Securing* includes lashing and unlashing.

3.6 *Stringers* are the uprights or sides of a ladder.

3.7 *Turnbuckles and lashing rods*[*] include similar cargo securing devices.

4 GENERAL

4.1 Introduction

4.1.1 Injuries to dockworkers on board visiting ships account for the majority of accidents that occur within container ports, with the most common activity that involves such injuries being the lashing/unlashing of deck containers. Ships' crew engaged in securing operations face similar dangers.

4.1.2 During the design and construction of containerships the provision of a safe place of work for lashing personnel is essential.

4.1.3 Container shipowners and designers are reminded of the dangers associated with container securing operations and urged to develop and use container securing systems which are safe by design. The aim should be to eliminate or at least minimize the need for:

.1 container top work;

.2 work in other equally hazardous locations; and

.3 the use of heavy and difficult to handle securing equipment.

4.1.4 It should be borne in mind that providing safe working conditions for securing containers deals with matters relating to design, operation, and maintenance, and that the problems on large containerships are not the same as on smaller ones.

4.2 Revised Recommendations on safety of personnel during container securing operations (MSC.1/Circ.1263)

Shipowners, ship designers and Administrations should take into account the recommendations on safe design of securing arrangements contained in these guidelines, and in the Recommendations on safety of personnel during container securing operations (MSC.1/Circ.1263).

4.3 Cargo Safe Access Plan (CSAP)

4.3.1 The Guidelines for the preparation of the Cargo Securing Manual (MSC/Circ.745) requires ships which are specifically designed and fitted for the purpose of carrying containers to have an approved Cargo Safe Access Plan (CSAP) on board, for all areas where containers are secured.

4.3.2 Stakeholders, including, but not limited to shipowners, ship designers, ship builders, administrations, classification societies and lashing equipment manufacturers,

[*] Refer to standard ISO 3874, Annex D Lashing rod systems and tensioning devices.

should be involved at an early stage in the design of securing arrangements on containerships and in the development of the CSAP.

4.3.3 The CSAP should be developed at the design stage in accordance with [chapter 5 of the annex to MSC/Circ....].

4.3.4 Designers should incorporate the recommendations of this annex into the CSAP so that safe working conditions can be maintained during all anticipated configurations of container stowage.

4.4 Training and familiarization

4.4.1 Personnel engaged in cargo securing operations should be trained in the lashing and unlashing of containers as necessary to carry out their duties in a safe manner. This should include the different types of lashing equipment that are expected to be used.

4.4.2 Personnel engaged in cargo securing operations should be trained in the identification and handling of bad order or defective securing gear in accordance with each ship's procedures to ensure damaged gear is segregated for repair and maintenance or disposal.

4.4.3 Personnel engaged in cargo securing operations should be trained to develop the knowledge and mental and physical manual handling skills that they require to do their job safely and efficiently, and to develop general safety awareness to recognize and avoid potential dangers.

4.4.4 Personnel should be trained in safe systems of work. Where personnel are involved in working at heights, they should be trained in the use of relevant equipment. Where practical, the use of fall protection equipment should take precedence over fall arrest systems.

4.4.5 Personnel who are required to handle thermal cables and/or connect and disconnect temperature control units should be given training in recognizing defective cables, receptacles and plugs.

4.4.6 Personnel engaged in containership cargo operations should be familiarized with the ship's unique characteristics and potential hazards arising from such operations necessary to carry out their duties.

5 RESPONSIBILITIES OF INVOLVED PARTIES

5.1 Administrations should ensure that:

.1 lashing plans contained within the approved Cargo Securing Manual are compatible with the current design of the ship and the intended container securing method is both safe and physically possible;

.2 the Cargo Securing Manual, lashing plans and the CSAP are kept up to date; and

.3 lashing plans and the CSAP are compatible with the design of the vessel and the equipment available.

5.2 Shipowners and operators should ensure that:

.1 portable cargo securing devices are certified and assigned with a maximum securing load (MSL). The MSL should be documented in the cargo securing manual as required by the CSS Code;

.2 the operational recommendations of this annex are complied with;

.3 correction, changes or amendments of the Cargo Securing Manual, lashing plans and the Cargo Safe Access Plan (CSAP) should be promptly sent to the competent authority for approval; and

.4 only compatible and certified equipment in safe condition is used.

5.3 Designers should follow design recommendations of these guidelines.

5.4 Shipbuilders should follow design recommendations of these guidelines.

5.5 Containership terminal operators should ensure that the recommendations of relevant parts of this annex are complied with.

6 DESIGN

6.1 General design considerations

6.1.1 *Risk assessment*

6.1.1.1 Risk assessments should be performed at the design stage taking into account the recommendations of this annex to ensure that securing operations can be safely carried out in all anticipated container configurations. This assessment should be conducted with a view toward developing the Cargo Safe Access Plan (CSAP). Hazards to be assessed should include but not be limited to:

.1 slips, trips and falls;

.2 falls from height;

.3 injuries whilst manually handling lashing gear;

.4 being struck by falling lashing gear or other objects;

.5 potential damage due to container operations. High-risk areas should be identified in order to develop appropriate protection or other methods of preventing significant damage;

.6 adjacent electrical risks (temperature controlled unit cable connections, etc.);

.7 the adequacy of the access to all areas that is necessary to safely perform container securing operations;

.8 ergonomics (e.g., size and weight of equipment) of handling lashing equipment; and

.9 implications of lashing 9'6" high, or higher, containers and mixed stows of 40' and 45' containers.

6.1.1.2 Shipbuilders should collaborate with designers of securing equipment in conducting risk assessments and ensure that the following basic criteria are adhered to when building containerships.

6.1.2 Ship designers should ensure that container securing operations performed in outer positions can be accomplished safely. As a minimum, a platform should be provided on which to work safely. This platform should have fencing to prevent workers falling off it.

6.1.3 The space provided between the containers stows for workers to carry out lashing operations should provide:

.1 a firm and level working surface;

.2 a working area, excluding lashings in place, to provide a clear sight of twist lock handles and allow for the manipulation of lashing gear;

.3 sufficient spaces to permit the lashing gear and other equipment to be stowed without causing a tripping hazard;

.4 sufficient spaces between the fixing points of the lashing bars on deck, or on the hatch covers, to tighten the turnbuckles;

.5 access in the form of ladders on hatch coamings;

.6 safe access to lashing platforms;

.7 protective fencing on lashing platforms; and

.8 adequate lighting in line with these guidelines.

6.1.4 Ship designers should aim to eliminate the need to access and work on the tops of deck stows.

6.1.5 Platforms should be designed to provide a clear work area, unencumbered by deck piping and other obstructions and take into consideration:

.1 containers must be capable of being stowed within safe reach of the workers using the platform; and

.2 the work area size and the size of the securing components used.

6.2 Provisions for safe access

6.2.1 *General provisions*

6.2.1.1 The minimum clearance for transit areas should be at least 2 m high and 600 mm wide.

6.2.1.2 All relevant deck surfaces used for movement about the ship and all passageways and stairs should have non-slip surfaces.

6.2.1.3 Where necessary for safety, walkways on deck should be delineated by painted lines or otherwise marked by pictorial signs.

6.2.1.4 All protrusions in accessways, such as cleats, ribs and brackets that may give rise to a trip hazard should be highlighted in a contrasting colour.

6.2.2 *Lashing position design (platforms, bridges and other lashing positions)*

6.2.2.1 Lashing positions should be designed to eliminate the use of three high lashing bars and be positioned in close proximity to lashing equipment stowage areas. Lashing positions should be designed to provide a clear work area which is unencumbered by deck piping and other obstructions and take into consideration:

.1 the need for containers to be stowed within safe reach of the personnel using the lashing position so that the horizontal operating distance from the securing point to the container does not exceed 1,100 mm and not less than 220 mm for lashing bridges and 130 mm for other positions;

.2 the size of the working area and the movement of lashing personnel; and

.3 the length and weight of lashing gear and securing components used.

6.2.2.2 The width of the lashing positions should preferably be 1,000 mm, but not less than 750 mm.

6.2.2.3 The width of permanent lashing bridges should be:

.1 750 mm between top rails of fencing; and

.2 a clear minimum of 600 mm between storage racks, lashing cleats and any other obstruction.

6.2.2.4 Platforms on the end of hatches and outboard lashing stations should preferably be at the same level as the top of the hatch covers.

6.2.2.5 Toe boards (or kick plates) should be provided around the sides of elevated lashing bridges and platforms to prevent securing equipment from falling and injuring people. Toe boards should preferably be 150 mm high, however, where this is not possible they should be at least 100 mm high.

6.2.2.6 Any openings in the lashing positions through which people can fall should be possible to be closed.

6.2.2.7 Lashing positions should not contain obstructions, such as storage bins or guides to reposition hatch covers.

6.2.2.8 Lashing positions which contain removable sections should be capable of being temporarily secured.

6.2.3 ***Fencing design***

6.2.3.1 Bridges and platforms, where appropriate, should be fenced. As a minimum, fencing design should take into consideration:

.1 the strength and height of the rails should be designed to prevent workers from falling;

.2 flexibility in positioning the fencing of gaps. A horizontal unfenced gap should not be greater than 300 mm;

.3 provisions for locking and removal of fencing as operational situations change based on stowage anticipated for that area;

.4 damage to fencing and how to prevent failure due to that damage; and

.5 adequate strength of any temporary fittings. These should be capable of being safely and securely installed.

6.2.3.2 The top rail of fencing should be 1 m high from the base, with two intermediate rails. The opening below the lowest course of the guard rails should not exceed 230 mm. The other courses should be not more than 380 mm apart.

6.2.3.3 Where possible fences and handrails should be highlighted with a contrasting colour to the background.

6.2.3.4 Athwartships cargo securing walkways should be protected by adequate fencing if an unguarded edge exists when the hatch cover is removed.

6.2.4 ***Ladder and manhole design***

6.2.4.1 Where a fixed ladder gives access to the outside of a lashing position, the stringers should be connected at their extremities to the guardrails of the lashing position, irrespective of whether the ladder is sloping or vertical.

6.2.4.2 Where a fixed ladder gives access to a lashing position through an opening in the platform, the opening shall be protected with either a fixed grate with a lock back mechanism, which can be closed after access, or fencing. Grabrails should be provided to ensure safe access through the opening.

6.2.4.3 Where a fixed ladder gives access to a lashing position from the outside of the platform, the stringers of the ladder should be opened above the platform level to give a clear width of 700 to 750 mm to enable a person to pass through the stringers.

6.2.4.4 A fixed ladder should not slope at an angle greater than 25° from the vertical. Where the slope of a ladder exceeds 15° from the vertical, the ladder should be provided with suitable handrails not less than 540 mm apart, measured horizontally.

6.2.4.5 A fixed vertical ladder of a height exceeding 3 m, and any fixed vertical ladder, from which a person may fall into a hold, should be fitted with guard hoops, which should be constructed in accordance with paragraphs 6.2.4.6 and 6.2.4.7.

6.2.4.6 The ladder hoops should be uniformly spaced at intervals not exceeding 900 mm and should have a clearance of 750 mm from the rung to the back of the hoop and be connected by longitudinal strips secured to the inside of the hoops, each equally spaced round the circumference of the hoop.

6.2.4.7 The stringers should be carried above the floor level of the platform by at least 1 m and the ends of the stringers should be given lateral support and the top step or rung should be level with the floor of the platform unless the steps or rungs are fitted to the ends of the stringers.

6.2.4.8 As far as practicable, access ladders and walkways, and work platforms should be designed so that workers do not have to climb over piping or work in areas with permanent obstructions.

6.2.4.9 There should be no unprotected openings in any part of the workplace. Access opening must be protected with handrails or access covers that can be locked back during access.

6.2.4.10 As far as practicable, manholes should not be situated in transit areas, however, if they are, proper fencing should protect them.

6.2.4.11 Access ladders and manholes should be large enough for persons to safely enter and leave.

6.2.4.12 A foothold at least 150 mm deep should be provided.

6.2.4.13 Handholds should be provided at the top of the ladder to enable safe access to the platform to be gained.

6.2.4.14 Manhole openings that may present a fall hazard should be highlighted in contrasting colour around the rim of the opening.

6.2.4.15 Manhole openings at different levels of the lashing bridge should not be located directly below one another, as far as practicable.

6.3 Lashing systems

6.3.1 *General provisions*

Lashing systems, including tensioning devices, should:

.1 conform to international standards[¤], where applicable;

.2 be compatible with the planned container stowages;

.3 be compatible with the physical ability of persons to safely hold, deploy and use such equipment;

.4 be uniform and compatible, e.g., twistlocks and lashing rod heads should not interfer with each other;

.5 be subject to a periodic inspection and maintenance regime. Non-conforming items should be segregated for repair or disposal; and

.6 be according to the CSM.

6.3.2 *Twistlock design*

6.3.2.1 Shipowners should ensure that the number of different types of twistlocks provided for cargo securing is kept to a minimum and clear instructions are provided for their operation. The use of too many different types of twistlocks may lead to confusion as to whether the twistlocks are locked.

6.3.2.2 The design of twistlocks should ensure the following:

.1 positive locking with easy up and down side identification;

.2 dislodging from corner fitting is not possible even when grazing a surface;

.3 access and visibility of the unlocking device is effective in operational situations;

.4 unlocked positions are easily identifiable and do not relock inadvertently due to jolting or vibration; and

.5 unlocking poles are as light as possible, of a simple design for ease of use.

6.3.2.3 Where it is not feasible to entirely eliminate working on the tops of container stows, the twistlock designs used should minimize the need for such working, e.g., use of SATLs, fully automatic twistlocks or similar design.

[¤] Refer to standard ISO 3874 – The Handling and Securing of Type 1 Freight Containers, annex A-D.

6.3.3 ***Lashing rod design***

6.3.3.1 The design of containership securing systems should take into account the practical abilities of the workers to lift, reach, hold, control and connect the components called for in all situations anticipated in the cargo securing plan.

6.3.3.2 The maximum length of a lashing rod should be sufficient to reach the bottom corner fitting of a container on top of two high cube containers and be used in accordance with the instructions provided by the manufacturers.

6.3.3.3 The weight of lashing rods should be minimized as low as possible consistent with the necessary mechanical strength.

6.3.3.4 The head of the lashing rod that is inserted in the corner fitting should be designed with a pivot/hinge or other appropriate device so that the rod does not come out of the corner fitting accidentally.

6.3.3.5 The rods length in conjunction with the length and design of the turnbuckle should be such that the need of extensions is eliminated when lashing high cube (9' 6") containers.

6.3.3.6 Light weight rods should be provided where special tools are needed to lash high-cube containers.

6.3.4 ***Turnbuckle design***

6.3.4.1 Turnbuckle end fittings should be designed to harmonize with the design of lashing rods.

6.3.4.2 Turnbuckles should be designed to minimize the work in operating them.

6.3.4.3 Anchor points for turnbuckles should be positioned to provide safe handling and to prevent the bending of rods.

6.3.4.4 To prevent hand injury during tightening or loosening motions, there should be a minimum distance of 70 mm between turnbuckles.

6.3.4.5 The turnbuckle should incorporate a locking mechanism which will ensure that the lashing does not work loose during the voyage.

6.3.4.7 The weight of turnbuckles should be minimized as low as possible consistent with the necessary mechanical strength.

6.3.5 ***Storage bins and lashing equipment stowage design***

6.3.5.1 Bins or stowage places for lashing materials should be provided.

6.3.5.2 All lashing gear should be stowed as close to its intended place of use as possible.

6.3.5.3 The stowage of securing devices should be arranged so they can easily be retrieved from their stowage location.

6.3.5.4 Bins for faulty or damaged gear should also be provided and appropriately marked.

6.3.5.5 Bins should be of sufficient strength.

6.3.5.6 Bins and their carriers should be designed to be lifted off the vessel and restowed.

6.4 Lighting design

A lighting plan should be developed to provide for:

.1 the proper illumination of access ways, not less than 10 lux (1 foot candle)*, taking into account the shadows created by containers that may be stowed in the area to be lit, for example different length containers in or over the work area;

.2 a separate fixed or temporary (where necessary) lighting system for each working space between the container bays, which is bright enough, not less than 50 lux (5 foot candle)*, for the work to be done, but minimizes glare to the deck workers;

.3 such illumination should, where possible, be designed as a permanent installation and adequately guarded against breakage; and

.4 the illumination intensity should take into consideration the distance to the uppermost reaches where cargo securing equipment is utilized.

7 OPERATIONAL AND MAINTENANCE PROCEDURES

7.1 Introduction

7.1.1 Procedures for safe lashing and securing operations should be included in the ships Safety Management System as part of the ISM Code documentation.

7.1.2 Upon arrival of the ship, a safety assessment of the lashing positions and the access to those positions should be made before securing work commences.

7.2 Operational procedures

7.2.1 *Container deck working*

7.2.1.1 Transit areas should be safe and clear of cargo and all equipment.

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* Refer to Safety and Health in Ports, ILO Code of Practice, section 7.1.5.

7.2.1.2 Openings that are necessary for the operation of the ship, which are not protected by fencing, should be closed during cargo securing work. Any necessarily unprotected openings in work platforms (i.e. those with a potential fall of less than 2 m), and gaps and apertures on deck should be properly highlighted.

7.2.1.3 The use of fencing is essential to prevent falls. When openings in safety barriers are necessary to allow container crane movements, particularly with derricking cranes, removable fencing should be used whenever possible.

7.2.1.4 It should be taken into account that when lifting lashing bars that can weigh between 11 and 21 kg and turnbuckles between 16 and 23 kg, there may be a risk of injury and severe illness as a result of physical strain if handled above shoulder height with the arms extended. It is therefore recommended that personnel work in pairs to reduce the individual workload in securing the lashing gear.

7.2.1.5 The company involved with cargo operation should anticipate, identify, evaluate and control hazards and take appropriate measures to eliminate or minimize potential hazards to prevent in particular with harmful lumbar spinal damage and severe illness as a result of physical strain.

7.2.1.6 Personnel engaged in containership cargo operations should wear appropriate Personnel Protective Equipment (PPE) whilst carrying out lashing operations. The PPE should be provided by the company.

7.2.1.7 Manual twistlocks should only be used where safe access is provided.

7.2.1.8 Containers should not be stowed in spaces configured for larger sized containers unless they can be secured under safe working conditions.

7.2.2 *Container top working*

7.2.2.1 When work on container tops can not be avoided, safe means of access should be provided by the container cargo operation terminal, unless the ship has appropriate means of access in accordance with the CSAP.

7.2.2.2 Recommended practice involves the use of a safety cage lifted by a spreader to minimize the risk to personnel.

7.2.2.3 A safe method of work should be developed and implemented to ensure the safety of lashers when on the top of container stows on deck. Where practical, the use of fall prevention equipment should take precedence over fall arrest equipment.

7.2.3 *Failure to provide safe lashing stations on board/carry out lashing by port workers*

7.2.3.1 Where there are lashing and unlashing locations on board ship where no fall protection, such as adequate handrails are provided, and no other safe method can be found, the containers should not be lashed or unlashed and the situation should be reported to shoreside supervisor and the master or deck officer immediately.

7.2.3.2 If protective systems cannot be designed to provide safe protected access and lashing work positions, in all cargo configurations then cargo should not be stowed in that location. Neither crew nor shore workers should be subjected to hazardous working conditions in the normal course of securing cargo.

7.3 Maintenance

7.3.1 In line with section 2.3 (Inspection and maintenance schemes) of the Revised Guidelines for the preparation of the cargo securing manual [(MSC.1/Circ....)] all ships should maintain a record book, which should contain the procedures for accepting, maintaining and repairing or rejecting of cargo securing devices. The record book should also contain a record of inspections.

7.3.2 Lighting should be properly maintained.

7.3.3 Walkways, ladders, stairways and fencings should be subject to a periodic maintenance programme which will reduce/prevent corrosion and prevent subsequent collapse.

7.3.4 Corroded walkways, ladders, stairways and fencings should be repaired or replaced as soon as practicable. The repairs should be effected immediately if the corrosion could prevent safe operations.

7.3.5 It should be borne in mind that turnbuckles covered with grease are difficult to handle when tightening.

7.3.6 Storage bins and their carriers should be maintained in a safe condition.

8 SPECIALIZED CONTAINER SAFETY DESIGN

8.1 Temperature controlled unit power outlets should provide a safe, watertight electrical connection.

8.2 Temperature controlled unit power outlets should feature a heavy duty, interlocked and circuit breaker protected electrical power outlet. This should ensure the outlet can not be switched “live” until a plug is fully engaged and the actuator rod is pushed to the “On” position. Pulling the actuator rod to the “Off” position should manually de-energize the circuit.

8.3 The temperature controlled unit power circuit should de-energize automatically if the plug is accidentally withdrawn while in the “On” position. Also, the interlock mechanism should break the circuit while the pin and sleeve contacts are still engaged. This provides total operator safety and protection against shock hazard while eliminating arcing damage to the plug and receptacle.

8.4 Temperature controlled unit power outlets should be designed to ensure that the worker is not standing directly in front of the socket when switching takes place.

8.5 The positioning of the temperature controlled unit feed outlets should not be such that the flexible cabling needs to be laid out in such a way as to cause a tripping hazard.

8.6 Stevedores or ships crew who are required to handle temperature controlled unit cables and/or connect and disconnect reefer units should be given training in recognizing defective wires and plugs.

8.7 Means or provisions should be provided to lay the temperature controlled unit cables in and protect them from lashing equipment falling on them during lashing operations.

8.8 Defective or inoperative temperature controlled unit plugs/electrical banks should be identified and confirmed as "locked out/tagged out" by the vessel.

9 REFERENCES

ILO Code of Practice – Safety and Health in Ports

ILO Convention 152 – Occupational Safety and Health in Dock Work

ISO Standard 3874 – The Handling and Securing of Type 1 Freight Containers

International Convention on Load Lines, 1966, as modified by the 1988 Protocol

Revised Recommendation on safety of personnel during container securing operations (MSC.1/Circ.1263)

Revised Guidelines for the preparation of the Cargo Securing Manual ([MSC.1/Circ....])".

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ANNEX 3

DRAFT MSC CIRCULAR

REVISED GUIDELINES FOR THE PREPARATION OF THE CARGO SECURING MANUAL

1 In accordance with regulations VI/5 and VII/6 of the 1974 SOLAS Convention, as amended, cargo units and cargo transport units shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration, which shall be drawn up to a standard at least equivalent to the guidelines developed by the Organization.

2 The Maritime Safety Committee, at its [eighty-seventh session (12 to 21 May 2010)], considered the proposal by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its thirteenth session (21 to 25 September 2009), and approved the Revised Guidelines for the preparation of the Cargo Securing Manual, as set out in the annex.

3 These Revised Guidelines are based on the provisions contained in the annex to MSC/Circ.745 but have been expanded to include the safe access for lashing of containers, taking into account the provisions of the Code of Safe Practice for Cargo Stowage and Securing (CSS Code), as amended. They are of a general nature and intended to provide guidance on the preparation of such Cargo Securing Manuals, which are required on all types of ships engaged in the carriage of cargoes other than solid and liquid bulk cargoes.

4 Member Governments are invited to bring these Guidelines to the attention of all parties concerned, with the aim of having Cargo Securing Manuals carried on board ships prepared appropriately and in a consistent manner, and to:

.4.1 apply the revised guidelines in its entirety for containerships, the keels of which were laid or which are at a similar stage of construction on or after 1 January 2015; and

.4.2 apply chapters 1 to 4 of the revised guidelines to existing containerships, the keels of which were laid or which were at a similar stage of construction before 1 January 2015.

5 This circular supersedes MSC/Circ.745.

ANNEX

REVISED GUIDELINES FOR THE PREPARATION OF THE CARGO SECURING MANUAL

PREAMBLE

In accordance with the International Convention for the Safety of Life at Sea, 1974 (SOLAS) chapters VI, VII and the Code of Safe Practice for Cargo Stowage and Securing (CSS Code), cargo units, including containers shall be stowed and secured throughout the voyage in accordance with a Cargo Securing Manual, approved by the Administration.

The Cargo Securing Manual is required on all types of ships engaged in the carriage of all cargoes other than solid and liquid bulk cargoes.

The purpose of these guidelines is to ensure that Cargo Securing Manuals cover all relevant aspects of cargo stowage and securing and to provide a uniform approach to the preparation of Cargo Securing Manuals, their layout and content. Administrations may continue accepting Cargo Securing Manuals drafted in accordance with Containers and cargoes (BC) – Cargo Securing Manual (MSC/Circ.385) provided that they satisfy the requirements of these guidelines.

If necessary, those manuals should be revised explicitly when the ship is intended to carry containers in a standardized system.

It is important that securing devices meet acceptable functional and strength criteria applicable to the ship and its cargo. It is also important that the officers on board are aware of the magnitude and direction of the forces involved and the correct application and limitations of the cargo securing devices. The crew and other persons employed for the securing of cargoes should be instructed in the correct application and use of the cargo securing devices on board the ship.

CHAPTER 1 – GENERAL

1.1 Definitions

Cargo securing devices are all fixed and portable devices used to secure and support cargo units.

Maximum securing load (MSL) is a term used to define the allowable load capacity for a device used to secure cargo to a ship. *Safe working load (SWL)* may be substituted for MSL for securing purposes, provided this is equal to or exceeds the strength defined by MSL.

Standardized cargo means cargo for which the ship is provided with an approved securing system based upon cargo units of specific types.

Semi-standardized cargo means cargo for which the ship is provided with a securing system capable of accommodating a limited variety of cargo units, such as vehicles, trailers, etc.

Non-standardized cargo means cargo which requires individual stowage and securing arrangements.

1.2 Preparation of the manual

The Cargo Securing Manual should be developed, taking into account the recommendations given in these Guidelines, and should be written in the working language or languages of the ship. If the language or languages used is not English, French or Spanish, a translation into one of these languages should be included.

1.3 General information

This chapter should contain the following general statements:

.1 "The guidance given herein should by no means rule out the principles of good seamanship, neither can it replace experience in stowage and securing practice."

.2 "The information and requirements set forth in this Manual are consistent with the requirements of the vessel's trim and stability booklet, International Load Line Certificate (1966), the hull strength loading manual (if provided) and with the requirements of the International Maritime Dangerous Goods (IMDG) Code (if applicable)."

.3 "This Cargo Securing Manual specifies arrangements and cargo securing devices provided on board the ship for the correct application to and the securing of cargo units, containers, vehicles and other entities, based on transverse, longitudinal and vertical forces which may arise during adverse weather and sea conditions."

.4 "It is imperative to the safety of the ship and the protection of the cargo and personnel that the securing of the cargo is carried out properly and that only appropriate securing points or fittings should be used for cargo securing."

.5 "The cargo securing devices mentioned in this manual should be applied so as to be suitable and adapted to the quantity, type of packaging, and physical properties of the cargo to be carried. When new or alternative types of cargo securing devices are introduced, the Cargo Securing Manual should be revised accordingly. Alternative cargo securing devices introduced should not have less strength than the devices being replaced."

.6 "There should be a sufficient quantity of reserve cargo securing devices on board the ship."

.7 "Information on the strength and instructions for the use and maintenance of each specific type of cargo securing device, where applicable, is provided in this manual. The cargo securing devices should be maintained in a satisfactory condition. Items worn or damaged to such an extent that their quality is impaired should be replaced."

.8 The Cargo Safe Access Plan (CSAP) is intended to provide detailed information for persons engaged in work connected with cargo stowage and securing. Safe access should be provided and maintained in accordance with this plan.

CHAPTER 2 – SECURING DEVICES AND ARRANGEMENTS

2.1 Specification for fixed cargo securing devices

This sub-chapter should indicate and where necessary illustrate the number, locations, type and MSL of the fixed devices used to secure cargo and should as a minimum contain the following information:

.1 a list and/or plan of the fixed cargo securing devices, which should be supplemented with appropriate documentation for each type of device as far as practicable. The appropriate documentation should include information as applicable regarding:

- Name of manufacturer
- Type designation of item with simple sketch for ease of identification
- Material(s)
- Identification marking
- Strength test result or ultimate tensile strength test result
- Result of non destructive testing
- Maximum Securing Load (MSL);

.2 fixed securing devices on bulkheads, web frames, stanchions, etc. and their types (e.g., pad eyes, eyebolts, etc.), where provided, including their MSL;

.3 fixed securing devices on decks and their types (e.g., elephant feet fittings, container fittings apertures, etc.) where provided, including their MSL;

.4 fixed securing devices on deckheads, where provided, listing their types and MSL; and

.5 for existing ships with non-standardized fixed securing devices, the information on MSL and location of securing points is deemed sufficient.

2.2 Specification for portable cargo securing devices

This sub-chapter should describe the number of and the functional and design characteristics of the portable cargo securing devices carried on board the ship, and should be supplemented by suitable drawings or sketches if deemed necessary. It should contain the following information as applicable:

.1 a list for the portable securing devices, which should be supplemented with appropriate documentation for each type of devices as far as practicable. The appropriate documentation should include information as applicable regarding:

- Name of manufacturer
- Type designation of item with simple sketch for ease of identification
    - Material(s), including minimum safe operational temperature
    - Identification marking
    - Strength test result or ultimate tensile strength test result

* Result of non destructive testing
* Maximum Securing Load (MSL);

.2 container stacking fittings, container deck securing fittings, fittings for interlocking of containers, bridge-fittings, etc., their MSL and use;

.3 chains, wire lashings, rods, etc., their MSL and use;

.4 tensioners (e.g., turnbuckles, chain tensioners, etc.), their MSL and use;

.5 securing gear for cars, if appropriate, and other vehicles, their MSL and use;

.6 trestles and jacks, etc., for vehicles (trailers) where provided, including their MSL and use; and

.7 anti-skid material (e.g., soft boards) for use with cargo units having low frictional characteristics.

2.3 Inspection and maintenance schemes

This sub-chapter should describe inspection and maintenance schemes of the cargo securing devices on board the ship.

2.3.1 Regular inspections and maintenance should be carried out under the responsibility of the master. Cargo securing devices inspections as a minimum should include:

.1 routine visual examinations of components being utilized; and

.2 periodic examinations/re-testing as required by the Administration. When required, the cargo securing devices concerned should be subjected to inspections by the Administration.

2.3.2 This sub-chapter should document actions to inspect and maintain the ship's cargo securing devices. Entries should be made in a record book, which should be kept with the Cargo Securing Manual. This record book should contain the following information:

.1 procedures for accepting, maintaining and repairing or rejecting cargo securing devices; and

.2 record of inspections.

2.3.3 This sub-chapter should contain information for the master regarding inspections and adjustment of securing arrangements during the voyage.

2.3.4 Computerized maintenance procedures may be referred to in this sub-chapter.

CHAPTER 3 – STOWAGE AND SECURING OF NON-STANDARDIZED AND SEMI-STANDARDIZED CARGO

3.1 Handling and safety instructions

This sub-chapter should contain:

.1 instructions on the proper handling of the securing devices; and

.2 safety instructions related to handling of securing devices and to securing and unsecuring of units by ship or shore personnel.

3.2 Evaluation of forces acting on cargo units

This sub-chapter should contain the following information:

.1 tables or diagrams giving a broad outline of the accelerations which can be expected in various positions on board the ship in adverse sea conditions and with a range of applicable metacentric height (GM) values;

.2 examples of the forces acting on typical cargo units when subjected to the accelerations referred to in paragraph 3.2.1 and angles of roll and metacentric height (GM) values above which the forces acting on the cargo units exceed the permissible limit for the specified securing arrangements as far as practicable;

.3 examples of how to calculate number and strength of portable securing devices required to counteract the forces referred to in 3.2.2 as well as safety factors to be used for different types of portable cargo securing devices. Calculations may be carried out according to Annex 13 to the CSS Code or methods accepted by the Administration;

.4 it is recommended that the designer of a Cargo Securing Manual converts the calculation method used into a form suiting the particular ship, its securing devices and the cargo carried. This form may consist of applicable diagrams, tables or calculated examples; and

.5 other operational arrangements such as electronic data processing (EDP) or use of a loading computer may be accepted as alternatives to the requirements of the above paragraphs 3.2.1 to 3.2.4, providing that this system contains the same information.

3.3 Application of portable securing devices on various cargo units, vehicles and stowage blocks

3.3.1 This sub-chapter should draw the master's attention to the correct application of portable securing devices, taking into account the following factors:

.1 duration of the voyage;

.2 geographical area of the voyage with particular regard to the minimum safe operational temperature of the portable securing devices;

.3 sea conditions which may be expected;

.4 dimensions, design and characteristics of the ship;

.5 expected static and dynamic forces during the voyage;

.6 type and packaging of cargo units including vehicles;

.7 intended stowage pattern of the cargo units including vehicles; and

.8 mass and dimensions of the cargo units and vehicles.

3.3.2 This sub-chapter should describe the application of portable cargo securing devices as to number of lashings and allowable lashing angles. Where necessary, the text should be supplemented by suitable drawings or sketches to facilitate the correct understanding and proper application of the securing devices to various types of cargo and cargo units. It should be pointed out that for certain cargo units and other entities with low friction resistance, it is advisable to place soft boards or other anti-skid material under the cargo to increase friction between the deck and the cargo.

3.3.3 This sub-chapter should contain guidance as to the recommended location and method of stowing and securing of containers, trailers and other cargo carrying vehicles, palletized cargoes, unit loads and single cargo items (e.g., woodpulp, paper rolls, etc.), heavy weight cargoes, cars and other vehicles.

3.4 Supplementary requirements for ro-ro ships

3.4.1 The manual should contain sketches showing the layout of the fixed securing devices with identification of strength (MSL) as well as longitudinal and transverse distances between securing points. In preparing this sub-chapter further guidance should be utilized from IMO Assembly resolutions A.533(13) and A.581(14), as appropriate.

3.4.2 In designing securing arrangements for cargo units, including vehicles and containers, on ro-ro passenger ships and specifying minimum strength requirements for securing devices used, forces due to the motion of the ship, angle of heel after damage or flooding and other considerations relevant to the effectiveness of the cargo securing arrangement should be taken into account.

3.5 Bulk carriers

If bulk carriers carry cargo units falling within the scope of chapter VI/5 or chapter VII/5 of SOLAS Convention, this cargo shall be stowed and secured in accordance with a Cargo Securing Manual, approved by the Administration.

CHAPTER 4 – STOWAGE AND SECURING OF CONTAINERS AND OTHER STANDARDIZED CARGO

4.1 Handling and safety instructions

This sub-chapter should contain:

.1 instructions on the proper handling of the securing devices; and

.2 safety instructions related to handling of securing devices and to securing and unsecuring of containers or other standardized cargo by ship or shore personnel.

4.2 Stowage and securing instructions

This sub-chapter is applicable to any stowage and securing system (i.e. stowage within or without cellguides) for containers and other standardized cargo. On existing ships the relevant documents regarding safe stowage and securing may be integrated into the material used for the preparation of this chapter.

4.2.1 Stowage and securing plan

This sub-chapter should consist of a comprehensive and understandable plan or set of plans providing the necessary overview on:

.1 longitudinal and athwartship views of under deck and on deck stowage locations of containers as appropriate;

.2 alternative stowage patterns for containers of different dimensions;

.3 maximum stack masses;

.4 permissible vertical sequences of masses in stacks;

.5 maximum stack heights with respect to approved sight lines; and

.6 application of securing devices using suitable symbols with due regard to stowage position, stack mass, sequence of masses in stack and stack height. The symbols used should be consistent throughout the Cargo Securing Manual.

4.2.2 Stowage and securing principle on deck and under deck

This sub-chapter should support the interpretation of the stowage and securing plan with regard to container stowage, highlighting:

.1 the use of the specified devices; and

.2 any guiding or limiting parameters as dimension of containers, maximum stack masses, sequence of masses in stacks, stacks affected by wind load, height of stacks.

It should contain specific warnings of possible consequences from misuse of securing devices or misinterpretation of instructions given.

4.3 Other allowable stowage patterns

This sub-chapter should provide the necessary information for the master to deal with cargo stowage situations deviating from the general instructions addressed to under sub-chapter 4.2, including appropriate warnings of possible consequences from misuse of securing devices or misinterpretation of instructions given.

Information should be provided with regard to, *inter alia*:

.1 alternative vertical sequences of masses in stacks;

.2 stacks affected by wind load in the absence of outer stacks;

.3 alternative stowage of containers with various dimensions; and

.4 permissible reduction of securing effort with regard to lower stacks masses, lesser stack heights or other reasons.

4.4 Forces acting on cargo units

This sub-chapter should present the distribution of accelerations on which the stowage and securing system is based, and specify the underlying condition of stability. Information on forces induced by wind and sea on deck cargo should be provided.

It should further contain information on the nominal increase of forces or accelerations with an increase of initial stability. Recommendations should be given for reducing the risk of cargo losses from deck stowage by restrictions to stack masses or stack heights, where high initial stability cannot be avoided.

CHAPTER 5 – CARGO SAFE ACCESS PLAN (CSAP)

5.1 Ships which are specifically designed and fitted for the purpose of carrying containers should be provided with a Cargo Safe Access Plan (CSAP) in order to demonstrate that personnel will have safe access for container securing operations. This plan should detail arrangements necessary for the conducting of cargo stowage and securing in a safe manner. It should include the following for all areas to be worked by personnel:

.1 hand rails;

.2 platforms;

.3 walkways;

.4 ladders;

.5 access covers;

.6 location of equipment storage facilities;

.7 lighting fixtures;

.8 container alignment on hatch covers/pedestals;

.9 fittings for specialized containers, such as reefer plugs/receptacles;

.10 first aid stations and emergency access/egress;

.11 gangways; and

.12 any other arrangements necessary for the provision of safe access.

5.2 Guidelines for specific requirements are contained in annex [14] to the CSS Code.

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MSC.1/Circ.1354
30 June 2010

AMENDMENTS TO THE ELEMENTS TO BE TAKEN INTO ACCOUNT WHEN CONSIDERING THE SAFE STOWAGE AND SECURING OF CARGO UNITS AND VEHICLES IN SHIPS (RESOLUTION A.533(13))

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its fourteenth session (21 to 25 September 2009), approved amendments to the Elements to be taken into account when considering the safe stowage and securing of cargo units and vehicles in ships (resolution A.533(13)), set out in the annex.

2 Member Governments are invited to apply the annexed amendments to the Elements (resolution A.533(13)) and bring them to the attention of shipowners, ship operators, shipmasters and crews and all other parties concerned.

3 Member Governments are invited to bring these amendments to the attention of all parties concerned, with the aim of applying them in a consistent manner, and to implement them for containerships, the keels of which were laid or which are at a similar stage of construction on or after 1 January 2015.

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ANNEX

AMENDMENTS TO THE ELEMENTS TO BE TAKEN INTO ACCOUNT WHEN CONSIDERING THE SAFE STOWAGE AND SECURING OF CARGO UNITS AND VEHICLES IN SHIPS (RESOLUTION A.533(13))

2 General elements

1 A new subparagraph .3 is added to paragraph 2.1 as follows:

".3 safe access and safe places of work are provided for persons engaged in work connected with cargo stowage and securing."

3 Elements to be considered by the shipowner and shipbuilder

2 A new subparagraph .9 is added to paragraph 3.1 as follows:

".9 safe access, safe place of work, illumination and working conditions for persons engaged in work connected with cargo stowage and securing."

3 A new paragraph 3.4 is added as follows:

"3.4 Ships which are specifically designed and fitted for the purpose of carrying containers should be provided with a Cargo Safe Access Plan (CSAP) in order to demonstrate that personnel will have safe access for container securing operations."

4 Elements to be considered by the master

4 A new subparagraph .6 is added to paragraph 4.1 as follows:

".6 where applicable, safe access to be provided in accordance with the CSAP and maintained throughout cargo operations."

5 Elements to be considered by the shipper, forward agents, road hauliers and stevedores (and, where appropriate, by the port authorities)

5 A new subparagraph .5 is added to paragraph 5.1 as follows:

".5 the CSAP, when applicable, and the lashing plan as required for by the CSM should be provided to the terminal operator in adequate time prior to the arrival of the ships."

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30 June 2010

AMENDMENTS TO THE GUIDELINES FOR SECURING ARRANGEMENTS FOR THE TRANSPORT OF ROAD VEHICLES ON RO-RO SHIPS (RESOLUTION A.581(14))

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its fourteenth session (21 to 25 September 2009), approved amendments to the Guidelines for securing arrangements for the transport of road vehicles on ro-ro ships (resolution A.581(14)), as amended by MSC/Circ.812, set out in the annex.

2 Member Governments are invited to apply the annexed amendments to the Guidelines and bring them to the attention of shipowners, ship operators, shipmasters and crews and all other parties concerned.

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ANNEX

AMENDMENTS TO THE GUIDELINES FOR SECURING ARRANGEMENTS FOR THE TRANSPORT OF ROAD VEHICLES ON RO-RO SHIPS (RESOLUTION A.581(14))

1 The existing paragraph 6.1 is replaced by the following:

"6.1 The maximum securing load (MSL) of lashings should not be less than 100 kN and they should be made of material having suitable elongation characteristics. However, for vehicles not exceeding 15 tonnes (GVM), lashings with lower MSL values may be used. The required number and MSL of lashings may be calculated according to annex 13 to the Code of Safe Practice for Cargo Stowage and Securing (CSS Code), taking into consideration the criteria mentioned in paragraph 1.5.1 of the Code."

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MSC.1/Circ.1356
30 June 2010

AMENDMENTS TO THE MANUAL ON LOADING AND UNLOADING OF SOLID BULK CARGOES FOR TERMINAL REPRESENTATIVES

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered a proposal by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its fourteenth session, approved the Amendments to the Manual on Loading and Unloading of Solid Bulk Cargoes for Terminal Representatives (MSC/Circ.1160), set out in the annex.

2 Member Governments are invited to bring the annexed amendments to the attention of the parties concerned.

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ANNEX

AMENDMENTS TO THE MANUAL ON LOADING AND UNLOADING OF SOLID BULK CARGOES FOR TERMINAL REPRESENTATIVES (MSC/CIRC.1160)

FOREWORD

1 Paragraph 1 is replaced by the following:

"1 In response to the continuing loss of ships carrying solid bulk cargoes – sometimes without trace and with heavy loss of life – the Code of Safe Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) was developed by IMO as one of a number of measures to enhance the operational and structural safety of bulk carriers. It was adopted as a recommendatory instrument by the International Maritime Organization's Assembly at its twentieth session in November 1997 by resolution A.862(20) and amended by resolutions MSC.238(82) and MSC.304(87).

DEFINITIONS

2 The definition for "Dry or solid bulk cargo" is deleted.

Section 1 – Definitions

3 The following definitions in section 1 in the left-hand column (BLU Code column) are added in alphabetical order:

"*Bulk Cargo Shipping Name (BCSN)* identifies a bulk cargo during transport by sea. When a cargo is listed in the IMSBC Code, the Bulk Cargo Shipping Name of the cargo is identified by capital letters in the individual schedules or in the index. When the cargo is a dangerous good, as defined in the International Maritime Dangerous Goods (IMDG) Code, as defined in regulation VII/1.1 of the SOLAS Convention, the Proper Shipping Name of that cargo is the Bulk Cargo Shipping Name."

"*IMSBC Code* means the International Maritime Solid Bulk Cargoes Code as defined in regulation VI/1.1 of the SOLAS Convention."

"*Solid bulk cargo* means any cargo, other than a liquid or a gas, consisting of a combination of particles, granules or any larger pieces of material generally uniform in composition which is loaded directly into the cargo spaces of a ship without any intermediate form of containment."

Section 3 – Procedures between ship and shore prior to ship's arrival

4 Subparagraph 2 of paragraph 3.1.4 (right-hand column) is replaced by the following:

".2 The transportable moisture limit and average moisture content in the case of a concentrate or other cargo which may liquefy".

5 Subparagraph .3 of paragraph 3.2.2 (left-hand column) is replaced by the following:

".3 nature and stowage of cargo already on board and, when solid bulk cargoes are on board, the Bulk Cargo Shipping Name (BCSN), the IMSBC Code Class and UN Number, when applicable".

6 The footnote corresponding to 3.2.2 (left-hand column) is deleted.

Section 5 – Cargo loading and handling of ballast

7 In paragraph 5.1.4 (left-hand column), the words "IMO Code of Safe Practice for Solid Bulk Cargoes (BC Code)" are replaced with "IMSBC Code".

Section 6 – Unloading cargo and handling of ballast

8 In paragraph 6.2.2 (right-hand column), the words "BC Code (Code of Safe Practice for Solid Bulk Cargoes) recommendations" are replaced with the words "IMSBC Code".

ANNEX 4 – TRAINING OF TERMINAL PERSONNEL INVOLVED IN LOADING AND/OR UNLOADING OF BULK CARRIERS

9 In paragraph 1, the reference to "BC Code (Code of Safe Practice for Solid Bulk Cargoes)" is replaced with "the International Maritime Solid Bulk Cargoes (IMSBC) Code".

ANNEX 6 – EMERGENCY PROCEDURES

10 In bullet point 8, the reference to "BC Code" is replaced with "IMSBC Code".

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19 June 2010

ADDITIONAL CONSIDERATIONS FOR THE SAFE LOADING OF BULK CARRIERS

1 The Maritime Safety Committee, at its eighty-seventh (12 to 21 May 2010) session, noted concerns that the provisions of SOLAS chapter VI, regulation 7 (Loading, unloading and stowage of solid bulk cargoes), and the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) are not being universally applied. In particular, the Committee noted that these concerns may be attributed to the lack of a mutual agreement between terminal representatives and masters on appropriate loading and unloading rates for solid bulk cargoes to prevent over-stressing of the ship's structure. In addition, the Committee noted that an agreed loading/unloading plan between the terminal representative and master is a mandatory requirement under SOLAS regulation VI/7.3.

2 The Committee recognized the need to provide further guidance to supplement the Code of practice for the safe loading and unloading of bulk carriers (BLU Code) and agreed to the Additional considerations for the safe loading of bulk carriers, set out in the annex.

3 The Committee further noted IACS Recommendation No.46, which provides relevant guidance and information on bulk cargo loading and discharging to reduce the likelihood of over-stressing the hull structure for bulk carriers.

4 The Committee urges Member Governments, terminal representatives, shipowners, ship operators, ship masters, ship charterers, shippers, receivers and other relevant parties to consider IACS Recommendation No.46 and the annexed Additional consideration for the safe loading of bulk carriers when developing an agreed loading or unloading plan in accordance with SOLAS regulation VI/7 and the BLU Code (resolution A.862(20), as amended).

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ANNEX

ADDITIONAL CONSIDERATIONS FOR THE SAFE LOADING OF BULK CARRIERS

Introduction

1 SOLAS chapter VI, regulation 7.3 requires that before any solid bulk cargo is loaded or unloaded, the master and the terminal representative shall agree on a plan which shall ensure that the permissible forces and moments on the ship are not exceeded during loading and unloading. To facilitate the development of the plan, the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) (resolution A862(20), as amended) is referenced.

2 The BLU Code requires co-operation and mutual agreement between the terminal representative and master with regard to how the ship is to be loaded and unloaded. The basic requirement of the Code is an agreed plan detailing the loading, unloading, ballasting and de-ballasting sequences. The preparation of a plan and maintaining control of the loading and unloading process in accordance with the plan and the BLU Code is fundamental to the safe loading of dry bulk cargoes.

3 The BLU Code also advises that charterers and shippers should allocate ships to terminals at which the ship will be capable of safely loading or unloading. Ships should be maintained in a sound, seaworthy condition and be free of defects that may prejudice the ships' safe loading, unloading or navigation. Terminal equipment should be properly certified, maintained and operated by duly qualified and, if appropriate, certificated personnel. All personnel, on board ship and terminal, should be trained in all aspects of safe loading and unloading of bulk carriers, commensurate with their responsibilities, including knowledge of the adverse effect that failure to comply with the agreed loading/unloading plan may have on the safety of the ship.

4 To supplement the BLU Code, guidance for terminal representatives and others involved in the handing of solid bulk cargoes is given in the Manual on Loading and Unloading of Solid Bulk Cargoes for Terminal Representatives (MSC/Circ.1160, as amended).

5 This document is intended to provide further guidance for Member Governments, terminal representatives, shipowners, ship operators, ship masters, ship charterers, shippers, receivers and other relevant parties in the loading of bulk cargoes with the aim of supporting the safe operation of ships and terminals.

Time taken for loading

6 The total time to load and the nominal loading rate should be agreed to in advance of loading and should take into account the safe operational limits of the ship and the terminal. This agreement should be a part of the loading plan required under SOLAS, regulation VI/7.3, and should also be in line with the provisions of the BLU Code.

7 While a terminal may have a high nominal loading rate (the pour rate that can be achieved by the loading equipment), the total time taken for loading will also be influenced by the steps required to safely load a ship in order to keep the structural stresses within permissible limits.

Arrival condition

8 Arrival in port in a very lightly ballasted state should be avoided as such conditions can have detrimental consequences on manoeuvrability and structural strength. Manoeuvrability can be significantly affected by a large trim associated with a very light ballast condition, for example by increasing bodily drift and difficulty in swinging the ship in windy conditions, decreasing turning performance and increasing difficulty in maintaining the ship's course and position under the actions of wind and currents. In terms of hull structures, loading cargo in a shallow draught condition can impose high stresses in the double bottom, cross deck and transverse bulkhead structures if the cargo in the holds is not adequately supported by the buoyancy up thrust.

9 In developing the loading plan, and determining the arrival condition, consideration should be given to manoeuvrability issues and local loading criteria in the loading manual.

Loading sequences

10 The loading sequences should be agreed to in advance of loading and must take into account the safe operational limits of the ship and the terminal. This agreement should be a part of the loading plan required under SOLAS regulation VI/7.3, and should also be in line with the provisions of the BLU Code.

11 In developing loading sequences it should be noted that in general the stress range imposed on the ship can be reduced by increasing the number of pours.

12 It is recommended that the loading sequences consist of a minimum of two pours per hold plus two trim pours. When calculating the stresses at each step consideration may be given to using a margin (i.e. using less than 100% of the permissible limit) to allow for potential over-runs or decoupling of ballast synchronization; providing time to stop loading operations, and subsequently take corrective action, while remaining within permissible limits.

During loading

13 Ballast operations need to be synchronized with loading operations as laid down and agreed in the loading plan required under SOLAS regulation VI/7.3. Ballast and loading operations should be carried out in a controlled manner in accordance with the loading plan and the provisions of BLU Code.

14 If at any time during loading the safe operational limits of the ship are exceeded, or likely to become so if the loading continues, the ship master has the right to suspend loading operations in order to take corrective actions (see SOLAS regulation VI/7.7).

Consequences of failure to apply BLU Code

15 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.

16 It is important to be aware that over-stressing of local structural members can occur even when the hull girder still water shear forces and bending moments are within their permissible limits. In this regard particular attention should be given to double bottom loading utilizing local loading diagrams in the loading manual.

17 If time for ensuring the cargo in each hold is trimmed (evenly distributed) is not included in the loading plan there is an increased risk of asymmetric loading. Asymmetric loading in the fore-aft direction can increase the lateral cargo pressure acting on the transverse bulkhead and increase the loads carried by the transverse bulkhead structure and the magnitude of transverse compressive stresses in the cross deck. Transverse asymmetric loading will introduce torsional loads leading to warping of the hull section giving rise to shearing and bending of the cross deck structure.

18 For more guidance please refer to IACS Recommendation No.46 Guidance and Information on Bulk Cargo Loading and Discharging to Reduce the Likelihood of Over-stressing the Hull Structure.

References

19 International Maritime Organization (IMO), 4 Albert Embankment, London, SE1 7SR, United Kingdom.

The IMO Code of practice for the Safe Loading and Unloading of Bulk Carriers, also known as the "BLU Code", as adopted by resolution A.862(20) and amended by resolution MSC.238(82).

The IMO Manual on Loading and Unloading of Solid Bulk Cargoes for Terminal Representatives, MSC/Circ.1160, as amended by MSC.1/Circ.1230.

IMO publications are available for purchase from www.imo.org.

20 International Association of Classification Societies (IACS), 36 Broadway, London, SW1H 0BH, United Kingdom.

IACS Recommendation No.46: Guidance and Information on Bulk Cargo Loading and Discharging to Reduce the Likelihood of Over-stressing the Hull Structure, available for downloading from www.iacs.org.uk.

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INTERNATIONAL MARITIME ORGANIZATION

Ref. T3/1.02

MSC.1/Circ.1363
30 June 2010

INTERIM GUIDELINES FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING NATURAL GAS HYDRATE PELLETS (NGHP) IN BULK

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Bulk Liquids and Gases, at its fourteenth session, approved the Interim Guidelines for the construction and equipment of ships carrying natural gas hydrate pellets (NGHP) in bulk, set out in the annex, to provide the basis for determining the detailed requirements for such ships by relevant administrations.

2 The Committee, noting that the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) is under review by the Sub-Committee on Bulk Liquids and Gases, agreed to review the Interim Guidelines after the finalization of the revision of the Code.

3 Member Governments are invited to bring the annexed Interim Guidelines to the attention of all parties concerned.

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ANNEX

INTERIM GUIDELINES FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING NATURAL GAS HYDRATE PELLETS (NGHP) IN BULK

1 SCOPE

These Interim Guidelines provide the information on appropriate safety measures for ships solely intended for the carriage of natural gas hydrate pellets (NGHP) in bulk (NGHP carriers). For this purpose, these Interim Guidelines provide information on the appropriate application of the requirements of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) to NGHP carriers. Persons in charge of the design, construction and operation of NGHP carriers are invited to consult these Interim Guidelines.

2 APPLICATION

For the purpose of these Interim Guidelines, the provisions of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), as adopted by the Maritime Safety Committee of the Organization by resolution MSC.5(48), as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82), apply to the design, construction and operation of NGHP carriers, unless expressly provided otherwise.

3 DEFINITIONS

For the purpose of these Interim Guidelines, unless expressly provided otherwise, the following definitions should apply.

3.1 *Natural gas hydrate pellets (NGHPs)* means artificially formed pellets of "natural gas hydrate". Natural gas hydrate is a crystalline solid which consists of molecules of natural gas (mainly methane) each surrounded by a cage of water molecules.

3.2 *International Gas Carrier Code (IGC Code)* means the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk as adopted by the Maritime Safety Committee of the Organization by resolution MSC.5(48), as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82).

3.3 *Cargo hold* is a space intended for the stowage of NGHPs.

3.4 *Cargo hold cover space* is a space above cargo holds which may be filled with natural gas.

3.5 *Cargo hold cover* is a structure constituting cargo hold cover space for maintaining gas-tightness.

3.6 *Gas machinery room* is a space containing equipment for natural gas handling.

3.7 *Hatchway cover* is a cover for the opening of a cargo hold, which provides gas-tightness between a cargo hold and a cargo hold cover space, as necessary.

3.8 *MARVS* is the maximum allowable relief valve setting of a cargo hold.

3.9 *Area classification (Zones 0, 1 and 2)* is based on the standard IEC 60079 (Electrical apparatus for explosive gas atmospheres).

4 GENERAL REQUIREMENTS

4.1 Evaluation of properties of NGHPs

Prior to shipment, properties of NGHPs should be evaluated through procedures approved by the competent authority. In the evaluation, average dissociation rate during the voyage should be estimated based on data obtained through a test. The composition of gases contained in the NGHPs should be clarified. The possible lowest cargo temperature should be estimated taking into account the planned cargo temperature range at the time of loading and the temperature drop due to dissociation during the voyage.

4.2 Risk assessment

The design and operation of the NGHP carrier should be evaluated by risk analysis early in the design process. Hazard identification should be carried out based on the design. At a minimum, due consideration should be given to the risks owing to fire and explosion related to cargo holds, cargo handling systems, other systems related to cargo and special features of the NGHP carrier.

4.3 Survey and certificate of integrity of cargo containment systems

Prior to construction of an NGHP carrier, a programme for the survey of cargo-related systems should be established by the Administration. The programme should determine the detailed procedure for survey including tests during construction and at the time of completion. The structural integrity of NGHP carriers, in particular of cargo-related systems, should be certified by the Administration based on the results of the survey.

4.4 Ship survival capability and location of cargo holds

4.4.1 The requirements of chapter 2 of the IGC Code, i.e. ship survival capability and location of cargo tanks, should apply to NGHP carriers with the following conditions:

.1 the NGHP carrier is regarded as "A type 2G/2PG ship"; and

.2 "cargo tank" reads "cargo hold".

4.4.2 The requirements in chapter 2 of the IGC Code need not apply to cargo hold cover spaces. In other words, a cargo hold cover may be a single-skin construction*. Cargo hold cover spaces should be located at least 760 mm inboard from the outermost moulded lines of the weather deck.

4.5 Cargo containment system

4.5.1 NGHPs may be carried in cargo holds of "integral tank" type as defined in paragraph 4.2.1 of the IGC Code provided that the structures of cargo holds are evaluated through analyses taking into account thermal stresses neglecting insulation inside the cargo holds.

* Double skin construction of a cargo hold cover may cause fire/explosion in the intermediate space in the structure and makes it difficult to survey the structure for maintaining integrity.

4.5.2 A secondary barrier is not required for cargo containment systems for NGHPs.

Note: The requirements for cargo containment systems of types other than "integral type" may be considered later, as necessary.

4.6 Design loads and supporting structures

4.6.1 Design loads should be determined based on the methods accepted by the Administration, taking into account the representative loading conditions and reasonably worst ship motion. The provisions in paragraph 4.3 of the IGC Code need not apply to NGHP carriers.

4.6.2 Supporting structures for cargo containment systems should be designed based on the methods accepted by the Administration, taking into account the various loads acting on the structures. The provisions in paragraph 4.6 of the IGC Code need not apply to NGHP carriers.

4.7 Materials for cargo holds and ship's structure

The materials for cargo holds and ship's structure may be determined based on the recognized standards for ships carrying cargoes with low temperature. The provisions in paragraph 4.9 of the IGC Code need not apply to NGHP carriers.

4.8 Minimum requirements (IGC Code, chapter 19)

The requirements for "Methane (LNG)" specified in chapter 19 of the IGC Code should apply to NGHP carriers, except that NGHP carriers may be of "A type 2PG ship".

4.9 Requirements for spaces containing cargo handling systems other than cargo holds

The following requirements should apply to spaces containing mechanical cargo handling systems other than cargo holds.

4.9.1 ***Materials***

The materials for the structure of the spaces should be in accordance with recognized standards for the design temperature. The design temperature for the materials should be calculated for the design conditions accepted by the Administration.

4.9.2 ***Design pressure***

The design pressure of an enclosed space should be the maximum value of the following:

.1 MARVS of relevant cargo holds; or

.2 for an enclosed space which may be segregated from all pressure relief valves, an envisaged maximum pressure at the ambient temperature, at the discretion of the Administration, under the assumption that the total amount of NGHPs on the cargo handling system in the space dissociate and the natural gas is contained in the space.

In this context, the provision of paragraph 5.2.3.3 of the IGC Code, i.e. the requirement of design pressure for process pressure vessels and piping, need not apply to spaces containing cargo handling systems on NGHP carriers.

4.9.3 ***Gas-tightness of joints***

Gas-tightness of all joints between gas-tight spaces should be kept to the satisfaction of the Administration.

4.9.4 ***Means of closure for openings of gas-tight spaces***

Means of closure should be provided for all openings of the spaces to prevent unexpected ingress or outflow of gases or air. Each means of closure should have remote control function, at the discretion of the Administration, and be capable of being opened and shut at the position of the means of closure.

4.9.5 ***Testing***

The pressure test and other non-destructive tests for welded parts should be conducted, as necessary, at the discretion of the Administration.

4.10 Requirements for cargo handling systems

The following requirements should apply to cargo handling systems.

4.10.1 ***Materials***

The materials for cargo handling systems should be in accordance with recognized standards for the design temperature. The design temperature for the materials should be calculated for the design condition accepted by the Administration.

4.10.2 ***Securing***

All moving parts of cargo handling systems should be adequately secured to the NGHP carrier during voyage to prevent damage to the ship. Securing devices should be provided in accordance with the established securing plan for the cargo handling systems.

4.10.3 ***Emergency shutdown***

4.10.3.1 At least one set of emergency shutdown systems should be provided for the cargo handling systems. Activation of the shutdown systems should be controlled at a continuously manned station during cargo handling. An established shutdown procedure should be followed automatically or by remote control, following activation of the shutdown system. Cargo handling should be stopped automatically in case of activation of the emergency shutdown systems.

4.10.3.2 Appropriate means should be provided to suspend cargo handling. Suspension of cargo handling should be controlled at a continuously manned station during cargo handling.

4.10.3.3 In the case that a cargo hold cover space is filled with natural gas, temperatures of all moving parts of the cargo handling system in the space should be monitored, and the threshold temperature should be determined, based on the ignition temperature of natural gas.

4.10.3.4 Cargo handling should be suspended in the case that one of the following situations takes place:

.1 ingress of air to a space filled with natural gas is detected;

.2 pressure of the spaces containing the cargo handling system becomes below atmospheric pressure; or

.3 monitored temperature of any part of the cargo handling system exceeds the threshold.

In the context of ingress of air, the recommended alarm level is 30% of the Lower Explosive Limit (LEL).

Note: The LEL of air in methane is 85%, i.e. the complementary value of the Upper Explosive Limit (UEL) of methane in the air (15%). Thus, 30% of LEL means 25.5% air and the recommended alarm level of oxygen concentration is 5.4%, i.e. 21% of air concentration.

In the context of temperature, the recommended threshold is 450°C, i.e. the ignition temperature criterion "T1" in standard IEC 60079 (Electrical apparatus for explosive gas atmospheres), taking into account that the temperature class of methane is "T1".

4.11 Stability precaution

If the cargo flows freely like grain[*], the cargo should be carried according to the provisions applicable to the stowage of grain cargoes. The bulk density of the cargo should be taken into account when determining the scantlings and securing arrangements of divisions and bin bulkheads and the stability effect of free cargo surfaces.

5 DETAILED APPLICATION OF REQUIREMENTS OF THE IGC CODE

5.1 General

5.1.1 Unless expressly provided in these Interim Guidelines, the requirements for "cargo tanks" in the IGC Code should apply to "cargo holds" on NGHP carriers.

5.1.2 Unless expressly provided in these Interim Guidelines, the requirements for "cargo pump-rooms and cargo compressor rooms" in the IGC Code should apply to "gas machinery room".

5.1.3 For the purpose of these Interim Guidelines:

.1 "Boil-off vapours" and "cargo vapour" should be read as "dissociated gases"; and

.2 "Boiling point of the cargo" should be read as "the envisaged lowest cargo temperature".

5.2 Requirements in the IGC Code not applicable to NGHP carriers

The requirements in the IGC Code, listed in table 1 of these Interim Guidelines, need not apply to NGHP carriers. Table 1 does not refer to the requirements not relevant to NGHP carriers, including the following:

.1 requirements for types 1G and 3G ships; and

[*] The cargo is considered non-cohesive, having an angle of repose less than, or equal to, 30º. Refer to section 5 of the International Maritime Solid Bulk Cargoes (IMSBC) Code.

.2 requirements for cargo holds of types other than "integral tank".

5.3 Modification/clarification of the requirements in the IGC Code

The requirements in the IGC Code, listed in table 2 of these Interim Guidelines, should apply to NGHP carriers with modification/clarification specified in table 2. Table 2 does not refer to the modification of "PREAMBLE".

5.4 Additional requirements for NGHP carriers

In addition to the relevant requirements in the IGC Code other than that specified in paragraph 3 of these Interim Guidelines, and as modified in accordance with paragraph 5 of these Interim Guidelines, the requirements listed in table 3 should apply.

Note: Tables 1 to 3 should be reviewed after the revision of the IGC Code.

6 SPECIAL DESIGN FEATURE AND REQUIREMENTS

6.1 The installation of a special enclosed room for electro-hydraulic units[*], which should be filled with inert gas, near the "reclaimer unit" (on "trolley") has been considered in order to avoid using a flexible high-pressure oil piping system of extraordinary length, while placement of high-voltage electric power cables in the natural gas atmosphere (Zone 0) is indispensable in that case. In the case that a special enclosed room for electro-hydraulic units is installed, special requirements for high-voltage electric power cables in the natural gas atmosphere (Zone 0) may have to be developed.

6.2 Furthermore, the use of ballast tanks of NGHP carriers for dissociated water after dissociation of NGHPs has been considered[**]. Such water probably contains natural gas and the dissolved gas may be emitted from the water by temperature rise during voyage. In this context, special requirements for prevention of explosion should be developed to permit such use of ballast tanks.

[*] Refer to the Conceptual design of a natural gas hydrate pellet carrier (paragraph 2 in the annex to document BLG 13/12/1).

[**] Refer to the Conceptual design of a natural gas hydrate pellet carrier (paragraph 5 in the annex to document BLG 13/12/1).

Table 1 – List of requirements of the IGC Code which need not apply to NGHP carriers

IGC Code paragraph number	Note
1.1.2 to 1.1.4.1	These application provisions are not applicable to NGHP carriers.
1.1.6 to 1.1.8	These application provisions are not applicable to NGHP carriers.
1.5.4 to 1.5.6	The provisions for certificate is not necessary at this stage for the reason that NGHP carriers will be designed and constructed, based on the agreement of relevant authorities, at first.
3.1.5.3 and 3.1.5.4	Cargo handling systems for NGHP carriers will be completely different from cargo handling systems for liquid.
3.5.3.1.1	Provision for "direct access" from the open deck to cargo holds is not applicable to NGHP carriers.
3.7.2.1	This requirement is applicable only to liquid cargoes.
3.7.4	This provision allows the connection of ballast piping to pumps in the machinery spaces. Ballast pumps should be located outside the machinery spaces, similar to on oil tankers, for the reason that ballast tanks are situated adjacent to cargo holds of "integral tank" type on NGHP carriers (see table 3).
4.10.16	Inspection for cold spots is not effective for NGHP carriers.
5.2.3.3	Refer to paragraph 3.9 of these Interim Guidelines.
6.2	The requirements for materials in the IGC Code are not suitable for NGHP carriers (see table 3).
8.2.18	The Guidelines for the evaluation of the adequacy of type C tank vent systems (resolution A.829(19)) is not applicable to NGHP carriers.
8.3	"Liquid level control" is not necessary because NGHPs are in solid form.
13.2 and 13.3	The requirements for "level indicators for cargo tanks" and "overflow control" are not applicable to NGHP carriers.
15	The requirements for "filling limits for cargo tanks" are not applicable to NGHP carriers.

Table 2 – Modification/clarification of requirements of the IGC Code for the application to NGHP carriers

IGC Code paragraph number	Modification/Clarification
1.1.1	The paragraph should read as follows: "The Code applies to ships regardless of their size, including those of less than 500 gross tonnage, engaged in carriage of NGHPs when carried in bulk."
1.3.6	The first sentence of the paragraph should read as follows: ""Cargo area" is that part of the ship which contains the cargo containment system and gas machinery room, cargo handling system, cargo hold cover space and includes deck areas over the full length and breadth of the part of the ship over the above-mentioned spaces."
1.3.9	The paragraph should read as follows: ""Cargoes" are NGHPs."
1.3.11	The paragraph should read as follows: ""Cargo hold" is the gas-tight shell designed to be the primary container of the cargo and includes all such containers whether or not associated with insulation or secondary barriers or both."
2.6.1.2	The following text is added at the end of the paragraph: ""Shell plating" means outer hull other than bulkhead deck. Therefore, a cargo hold cover may be a single skin construction and the cargo holds may constitute the weather deck."
2.7.2	The paragraph should read as follows: "Permeability of cargo space should be determined by a competent authority."
3.1.2	The paragraph should read as follows: "Where cargo is carried in a cargo containment system not requiring a secondary barrier, segregation of hold spaces from spaces referred to in paragraph 3.1.1 of the IGC Code or spaces either below or outboard of the hold spaces, other than cargo hold cover space, may be effected by cofferdams, fuel oil tanks or a single gas-tight bulkhead of all-welded construction forming an A-60 class division. A gas-tight A-0 class division is satisfactory if there is no source of ignition or fire hazard in the adjoining spaces (see table 3)."
3.1.5.1	The paragraph should read as follows: "Any piping system and cargo handling system which may contain cargo or dissociated gas should be segregated from other piping systems, except where interconnections are required for cargo-related operations such as purging, gas-freeing or inerting. Notwithstanding this requirement, fire lines and other piping systems essential for safety need not be segregated from such a cargo handling system. In such cases, precautions should be taken to ensure that cargo or cargo vapour cannot enter such other piping systems through the interconnections (see table 3)."

IGC Code paragraph number	Modification/Clarification
3.1.5.2	The paragraph should read as follows: "Any piping system which may contain cargo or cargo vapour should, except as provided in chapter 16 of the IGC Code, not pass through any accommodation space, service space or control station or through a machinery space other than a gas machinery room."
3.7.4	The paragraph should read as follows: "Any piping in a space adjacent to a cargo hold should not be connected to pumps in a machinery space."
4.3	Refer to paragraph 3.6 of these Interim Guidelines.
4.6	Refer to paragraph 3.6 of these Interim Guidelines.
4.9	Refer to paragraph 3.7 of these Interim Guidelines.
5	Refer to paragraph 3.9 of these Interim Guidelines.
8.5	The paragraph should read as follows: "The capacity of the pressure relief valve for each cargo hold should be determined, to the satisfaction of the Administration, based on the anticipated dissociation rate of NGHPs, taking the following conditions into consideration: (1) dissociation heat of NGHPs; (2) ambient temperature; (3) insulation of the cargo hold."
9.1.2	The paragraph should read as follows: "A sufficient number of gas monitoring instruments should be provided for each cargo hold in order to adequately monitor the progress of purging and gas-freeing."
11.1.2	The paragraph should read as follows: "All sources of ignition should be excluded from spaces where flammable vapour may be present except as otherwise provided in chapters 10 and 16 of the IGC Code and in spaces not containing air/oxygen maintaining positive pressure."
11.2 to 11.4	Fire safety systems for cargo areas on NGHP carriers should be determined based on the properties of NGHPs and envisaged accident scenarios, taking into account the requirements in these paragraphs of the IGC Code.

IGC Code paragraph number	Modification/Clarification
11.5.1	The paragraph should read as follows: "The gas machinery room of any ship should be provided with a fixed fire extinguishing system at the discretion of the Administration. A notice should be exhibited at the controls stating that the system is only to be used for fire-extinguishing and not for inerting purposes, due to the electrostatic ignition hazard. The alarms referred to in regulation II-2/5.1.6 of the 1983 SOLAS amendments should be safe for use in a flammable cargo vapour-air mixture. For the purpose of this requirement, an extinguishing system should be provided which would be suitable for machinery spaces. However, in the case that a carbon dioxide system is used, the amount of carbon dioxide gas carried should be sufficient to provide a quantity of free gas equal to 45% of the gross volume of the gas machinery room in all cases."
12.1.2	The paragraph should read as follows: "Mechanical ventilation inlets and outlets should be arranged to ensure sufficient air movement through the space to avoid the accumulation of flammable or toxic vapours and to ensure a safe working environment, but in no case should the ventilation systems have total capacity of less than 30 changes of air per hour based upon the total volume of the space. As an exception, gas-safe cargo control rooms may have eight changes of air per hour.
13.1.1	The first sentence of the paragraph should read as follows: "Each cargo hold should be provided with means for indicating the pressure and temperature of the gas."
13.5.1	The paragraph should read as follows: "Each cargo hold should be provided with at least one device for indicating gas temperatures. The temperature-indicating devices should be marked to show the lowest temperature for which the cargo hold has been approved by the Administration."
13.6.11	The first sentence of the paragraph should read as follows: "In the case of flammable products, where cargo containment systems other than independent tanks are used, hold spaces, cargo hold cover space and interbarrier spaces should be provided with a permanently installed gas detection system capable of measuring gas concentration of 0% to 100% by volume."
16.1.1	The paragraph should read as follows: "Methane (NGHP) is the cargo whose dissociated gas may be utilized in machinery spaces of category A and in such spaces may be utilized only in boilers, inert gas generators, combustion engines and gas turbines."
18.2.1	The paragraph should read as follows: "The master should ascertain that the quantity and characteristics of each product to be loaded are within the limits indicated in the Loading and Stability Information booklet (as provided for in paragraph 2.2.5 of the IGC Code)."

Table 3 – Additional requirements for NGHP carriers

IGC Code paragraph number	Additional requirement
3.1.2 (New text)	Cargo hold cover space and cargo holds should be separated by A-0 class deck and hatchway covers which are resistant to fire and liquids and provide gas-tightness between these spaces, to the satisfaction of the Administration.
3.1.5.1 (New text)	Any piping system which does not contain cargo or cargo vapour, such as a fire main piping system, should be protected from ingress of natural gas into the piping system to the satisfaction of the Administration.
3.5.5 (New paragraph)	Any access way having doors should not be fitted on the cargo hold cover space unless all the following arrangements are provided: .1 the access way is designed for the dedicated purpose of providing access to inside the cargo hold cover space from the open space on a weather deck and not used for the other purpose; .2 the access way is provided with double-entry doors which are gas-tight, made of steel and self-closing type without holding back arrangements; .3 an interlock system is provided to prevent both doors being opened simultaneously; and .4 an audible and visual alarm system is provided to indicate if more than one door is moved from the closed position and the alarm system gives a warning on both sides and inside the access way. Note: "Bolted cover" is not an access door.
4.2.7 (New text)	Refer to paragraph 3.1 of these Interim Guidelines.
4.10.1.1 (New text)	Welded joints of the longitudinal inner side plating and inner bottoms of cargo holds should be of the butt weld, full penetration type. For connections among longitudinal inner side plating and transverse bulkheads near engine-rooms and fore construction, longitudinal inner side plating and upper deck should be the tee welds of the full penetration type.
4.10.6 (New text)	Gas-tightness of the cargo hold cover and at the hatchway covers should be tested to the satisfaction of the Administration.
6.2 (New text)	All materials of construction should be approved by the Administration.
6.3.6.1 (New text)	For all cargo holds, production weld tests should generally be performed for approximately each 50 m of butt weld joints and should be representative of each welding position. Tests, other than those specified in paragraph 6.3.6.4 of the IGC Code, may be required for cargo holds at the discretion of the Administration.
6.3.7.1 (New text)	Full penetration butt welds of the inner plating of cargo holds should be subjected to radiographic inspection at the discretion of the Administration.
8.2.1 (New text)	A cargo hold cover space should be provided with pressure relief devices complying with recognized standards.

IGC Code paragraph number	Additional requirement
9.2.1 (New text)	A shipboard inert gas generation system or shipboard inert gas storage which should be sufficient for normal consumption for at least 30 days should be installed to inert cargo holds and cargo hold cover space.
12.1.2 (New text)	A gas machinery room situated below the weather deck should be provided with at least two sets of ventilation systems having separated power source.
13.5.3 (New text)	If a cargo hold is provided with a cooling system, the cargo hold boundaries should be fitted with a sufficient number of thermometers to establish that an unsatisfactory temperature gradient does not occur.
13.6.15 (New paragraph)	Notwithstanding the requirements in section 13.6 of the IGC Code, a fixed gas monitoring system of other type, e.g., a system based on remote sensing technology, may be installed in lieu of the fixed gas monitoring equipment required by this section, at the discretion of the Administration, provided that the reliability and effectiveness of the system is not inferior to those of the equipment required by this section.
13.7 (New paragraph)	**Detection of oxygen** 13.7.1 Where a mechanical cargo handling system is installed in a cargo hold cover space, oxygen detection equipment acceptable to the Administration should be provided for continuous monitoring of oxygen level. 13.7.2 Audible and visual alarms from the oxygen detection equipment, if required by this section, should be located on the navigating bridge, in the control position required by paragraph 13.1.3 of the IGC Code, and at the gas detector readout location. 13.7.3 Oxygen detection equipment may be located in the control position required by paragraph 13.1.3 of the IGC Code, on the navigating bridge or at other suitable locations. 13.7.4 Oxygen detection equipment should be so designed that it may readily be tested. Testing and calibration should be carried out at regular intervals. Suitable equipment and span gas for this purpose should be carried on board. Where practicable, permanent connections for such equipment should be fitted. 13.7.5 A permanently installed system of oxygen detection should be provided for cargo holds and vicinity of doors on cargo hold cover. 13.7.6 For the spaces listed in paragraph 13.7.5 of the IGC Code, audible and visual alarms should be activated in the control positions at the threshold concentration determined by the Administration.
18.4.3.1 (New text)	Where insulation is provided inside a cargo hold, special fire precautions should be taken in the event of hot work carried out in the vicinity of the cargo hold. For this purpose, gas absorbing and de-absorbing characteristics of the insulation material should be taken into account.

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CSC.1/Circ.138
30 June 2010

REVISED RECOMMENDATIONS ON HARMONIZED INTERPRETATION AND IMPLEMENTATION OF THE INTERNATIONAL CONVENTION FOR SAFE CONTAINERS, 1972, AS AMENDED

1 The Maritime Safety Committee, at its sixty-second session (24 to 28 May 1993), approved Recommendations on harmonized interpretation and implementation of the International Convention for Safe Containers, 1972, as amended (CSC/Circ.100).

2 The Committee, at its seventy-fifth session (15 to 24 May 2002), agreed that information on the implementation of the requirements for material characteristics of the CSC Safety Plates should be circulated to all Contracting Parties to the CSC Convention (CSC/Circ.123).

3 The Committee, at its seventy-fifth session (15 to 24 May 2002), approved CSC/Circ.124 on Amendments to the harmonized interpretation and implementation of the International Convention for Safe Containers, 1972, as amended (CSC/Circ.100).

4 The Committee, at its eightieth session (11 to 20 May 2005), recognizing the need for guidance to the officer exercising control under the provisions of article VI of the International Convention for Safe Containers, 1972, as amended, approved the Guidance on serious structural deficiencies in containers (CSC/Circ.134).

5 The Committee, at its eighty-sixth session (27 May to 5 June 2009), approved CSC/Circ.137 on Amendments to the Guidance on serious structural deficiencies in containers (CSC/Circ.134).

6 The Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its fourteenth session (21 to 25 September 2009), reviewed the aforementioned circulars, in order to remove ambiguities on the maintenance and examination, and control requirements for containers, and prepared a consolidated document.

7 The Committee, at its eighty-seventh session (12 to 21 May 2010), after having considered the above proposal by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its fourteenth session, approved the Revised Recommendations on harmonized interpretation and implementation of the International Convention for Safe Containers, 1972, as amended, as set out in the annex.

8 Contracting Parties to the International Convention for Safe Containers, 1972, are invited to bring these Revised Recommendations to the attention of all parties concerned.

9 This circular supersedes CSC/Circ.100, CSC/Circ.123, CSC/Circ.124, CSC/Circ.134 and CSC/Circ.137.

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ANNEX

REVISED RECOMMENDATIONS ON HARMONIZED INTERPRETATION AND IMPLEMENTATION OF THE INTERNATIONAL CONVENTION FOR SAFE CONTAINERS, 1972, AS AMENDED

1 GENERAL

The various points concerning harmonized interpretation and implementation of the International Convention for Safe Containers (CSC), 1972, as amended on which consensus has been reached are given below.

2 DEFINITIONS (article II, paragraphs 8 to 10)

2.1 *New container and existing container.* Where necessary, individual Administrations should determine the date on which the construction of a container shall be deemed to have commenced for purposes of determining whether a container should be considered as "new" or as "existing".

2.2 *Owner*, for the purpose of these Revised Recommendations also includes the owner's local representative.

2.3 For the purposes of these Revised Recommendations, the following definitions are used:

.1 *depot* means a repair or storage facility or location; and

.2 *structurally sensitive components* means those container components that are significant in allowing the container to be safely used in transportation; they are listed under paragraph 10.4 below and shown in figures 1 to 5.

3 APPLICATION (article III, paragraph 1)

3.1 Swap bodies/demountables

3.1.1 It is agreed that the CSC does not have to be applied to containers known as swap bodies/demountables and designed and used for carriage by road only or by rail and road only and which are without stacking capability and top lift facilities.

3.1.2 It is also agreed that CSC does not have to be applied to such swap bodies/demountables transported by sea on condition that they are mounted on a road vehicle or rail wagon. However, CSC does apply to swap bodies/demountables used in transoceanic services.

3.2 Offshore containers

It is agreed that the CSC does not necessarily apply to offshore containers that are handled in open seas. Offshore containers are subject to different design, handling and testing parameters as determined by the Administration. Nonetheless offshore containers may be approved under the provisions of the CSC provided the containers meet all applicable provisions and requirements of the Convention[*].

[*] Refer to Guidelines for the approval of offshore containers handled in open seas (MSC/Circ.860).

3.3 Ship's gear carriers and bins

3.3.1 It is agreed that the CSC does not necessarily apply to ship's gear carriers and bins, as skeletal platform based containers with fixed end posts and associated storage bins used for the storage of twist-locks, lashing bars, etc., are not used for international transport as defined by this Convention and so are not containers as defined. However, these specialist containers are carried aboard container and other ships and are handled in the same way as all other containers, and therefore present the same risks during loading and discharging from the ship.

3.3.2 Consequently, it is recommended that these units should be included in a maintenance and examination scheme and subject to periodic inspections.

4 ENTRY INTO FORCE (articles III and VIII)

All containers should be inspected and affixed with Safety Approval Plates by the Administration of the Contracting Party not later than five years from the date of entry into force of the Convention for that Party.

5 TESTING, INSPECTION AND APPROVAL (article IV, paragraphs 1 and 2): SELECTION OF ORGANIZATIONS ENTRUSTED TO CARRY OUT THESE FUNCTIONS

Administrations will require a basic description of the organizations to be entrusted with testing, inspection and approval functions, together with evidence of their technical capability to carry this out, and will have to satisfy themselves as to the financial well-being of such organizations. The Administrations will, furthermore, have to satisfy themselves that the organizations are free from undue influence by any container owner, operator, manufacturer, lessor, repairer and other concerned party who may have a vested interest in obtaining container approval.

6 APPROVAL OF CONTAINERS FOR FOREIGN OWNERS OR MANUFACTURERS (article IV, paragraph 3) AND RECIPROCITY

6.1 Where possible, Contracting Parties should make every effort to provide facilities or means to grant approvals to foreign container owners or manufacturers seeking their approval of containers in accordance with the provisions of the Convention.

6.2 Approval of containers would be facilitated if classification societies or other organizations approved by one Contracting Party could be authorized to act for other contracting Parties under arrangements acceptable to the parties involved.

7 MAINTENANCE AND STRUCTURAL MODIFICATIONS (article IV)

7.1 Development of detailed guidelines on standards of maintenance will create an unnecessary burden for Administrations attempting to implement the Convention as well as for owners. However, in order to ensure uniformity in the inspection of containers and their ongoing operational safety, the Contracting Party concerned should ensure the following elements are covered in each prescribed periodic or approved continuous examination programme:

.1 methods, scope and criteria to be used during examinations;

.2 frequency of examinations;

.3 qualifications of personnel to carry out examinations;

.4 system of keeping records and documents (see section 12 below);

.5 a system for recording and updating the identification numbers for all containers covered by the appropriate examination scheme;

.6 methods and systems for maintenance criteria that addresses the design characteristics of the specific containers;

.7 provisions for maintaining leased containers if different than those used for owned containers; and

.8 conditions and procedures for adding containers into an already approved programme.

7.2 All prescribed periodic or approved continuous examination programmes should be subject to a period of validity of the approval and shall be reviewed by the Administration not later than 10 years after approval or re-approval to ensure their continued viability.

7.3 Administrations should periodically evaluate, by audits or other equivalent means, that the provisions of the approved programme are being fully followed. Such evaluations should occur as determined by the Administration, but at least once every five years.

7.4 The interpretation of the provision "the owner of the container shall be responsible for maintaining it in safe condition" (Annex I, regulation 2, paragraph 1 of the Convention) should be such that the owner of a container (as defined in article II, paragraph 10 of the Convention) should be held accountable to the Government of any territory on which the container is operated for the safe condition of that container.

7.5 The owner should be bound by the existing safety laws of such a territory and such law or regulation as may implement the control requirements of article VI of the Convention. Nevertheless the methods by which owners achieve, under the provisions of article IV, the safe condition of their containers, that is the appropriate combination of planned maintenance, procedures for refurbishment, refit and repair and the selection of organizations to perform this work, should be their own responsibility. If there is clear evidence for believing that an owner is repeatedly failing to achieve a satisfactory level of safety, the government of the territory in which the owner has his Head Office of domicile should be requested to ensure that appropriate corrective action is taken.

7.6 The responsibility of the owner to maintain his container in a safe condition includes the responsibility to ensure that any modifications carried out on an approved container do not adversely affect or render inaccurate the information recorded on the Safety Approval Plate. Under the provisions of Annex I, chapter V, regulation 11, the owner of a container which has been modified in a manner resulting in structural changes shall notify the Administration or an approved organization duly authorized by it of those changes. The Administration or authorized organization may determine whether the results of the original tests conducted in accordance with Annex II for the initial container approval remain valid for the modified container.

7.7 If an owner removes a container from service and it no longer requires to comply with the Convention or does not maintain that container in accordance with the provisions of the Convention, or makes structural modifications without following the procedures in paragraph 7.6 above, the owner must remove the Safety Approval Plate.

8 WITHDRAWAL OF APPROVAL (article IV, paragraph 5)

8.1 With regard to withdrawal of approval, the *Administration concerned* should be considered as the Administration that issued the approval. While any Contracting Party may exercise control over container movement pursuant to article VI, only the Administration that approved the container has the right to withdraw its approval. When approval has been withdrawn, the Administration concerned should require the removal of the Safety Approval Plate.

9 ACCEPTANCE OF APPROVALS (article V)

9.1 Records of approved Continuous Examination Programmes

Administrations should maintain a list of approved Continuous Examination Programmes (ACEP) and make the list publicly available.

10 CONTROL (article VI)

10.1 General

10.1.1 This section concerns the control of containers under the Convention and does not address maintenance and examination issues.

10.1.2 For the purposes of effecting control (as envisaged in article VI of the Convention) Contracting Parties should only appoint authorized control officers of government bodies. Article VI requires that such control should be limited to verifying that the container carries a valid Safety Approval Plate, and an ACEP or a valid Next Examination Date (NED) marking, unless there is significant evidence for believing that the condition of the container is such as to create an obvious risk to safety.

10.2 Training of authorized control officers

The Contracting Party exercising control should ensure that authorized control officers have received the necessary training. This training should involve both theoretical and practical instruction.

10.3 Unsafe containers

10.3.1 Control officers who find a container that is in a condition that creates an obvious risk to safety should stop the container until it can be ensured that it is in a safe condition to continue in service.

10.3.2 All containers with serious structural deficiencies in structurally sensitive components (see section 10.4) should be considered to be in a condition that creates an obvious risk to safety.

10.3.3 Control officers should notify the container owner whenever a container is placed under control.

10.3.4 Control officers may permit the onward movement of a container that has been stopped to its ultimate destination providing that it is not lifted from its current means of transport.

10.3.5 Empty containers with serious structural deficiencies to structurally sensitive components are also deemed to place a person in danger. Empty containers are typically repositioned for repair at an owner-selected depot provided they can be safely moved; this can involve either a domestic or an international move. Any damaged container being so repositioned should be handled and transported with due regard to its structural deficiency.

Clear signage should be placed on all sides and the top of the damaged container to indicate it is being moved for repairs only.

10.3.6 Empty containers with severe damage that prevents safe lifting of the container, e.g., damaged, misplaced or missing corner fittings or a failure of the connection between side walls and bottom side rails, should only be moved when carried on a platform-based container, such as a flatrack.

10.3.7 Major damage may be the result of significant impact which could have been caused by improper handling of the container or other containers, or significant movement of the cargo within the container. Therefore, special attention should be given to signs of recent impact damage.

10.3.8 Damage to a container may appear serious without creating an obvious risk to safety. Some damage, such as holes, may infringe customs requirements but may not be structurally significant.

10.4 Structurally sensitive components and definition of serious structural deficiencies for consideration by authorized control officers only

10.4.1 The structurally sensitive components of a container that should be examined for serious deficiencies are the:

.1 top rail;

.2 bottom rail;

.3 header;

.4 sill;

.5 corner posts;

.6 corner and intermediate fittings;

.7 understructure; and

.8 locking rods.

10.4.2 The following criteria should be used to make immediate out-of-service determinations by authorized control officers. They should not be used as repair and in-service criteria under a CSC ACEP or a periodic examination scheme. Figure 5 is a flow chart that illustrates the actions to be taken by an authorized control officer.

STRUCTURALLY SENSITIVE COMPONENT	**SERIOUS STRUCTURAL DEFICIENCY**
Top rail	Local deformation to the rail in excess of 60 mm or separation or cracks or tears in the rail material in excess of 45 mm in length. Note: On some designs of tank containers the top rail is not a structurally significant component.
Bottom rail	Local deformation perpendicular to the rail in excess of 100 mm or separation or cracks or tears in the rail's material in excess of 75 mm in length.
Header	Local deformation to the header in excess of 80 mm or cracks or tears in excess of 80 mm in length.
Sill	Local deformation to the sill in excess of 100 mm or cracks or tears in excess of 100 mm in length.
Corner posts	Local deformation to the post exceeding 50 mm or tears or cracks in excess of 50 mm in length.
Corner and intermediate fittings (Castings)	Missing corner fittings, any through cracks or tears in the fitting, any deformation of the fitting that precludes full engagement of securing or lifting fittings, any deformation of the fitting beyond 5 mm from its original plane, any aperture width greater than 66.0 mm, any aperture length greater than 127.0 mm, any reduction in thickness of the plate containing the top aperture that makes it less than 23.0 mm thick or any weld separation of adjoining components in excess of 50 mm in length.
Understructure	Two or more adjacent cross members missing or detached from the bottom rails. 20% or more of the total number of cross members missing or detached. Note: If onward transportation is permitted, it is essential that detached cross members are precluded from falling free.
Locking rods	One or more inner locking rods are non-functional. Note: Some containers are designed and approved (and so recorded on the CSC Plate) to operate with one door open or removed.

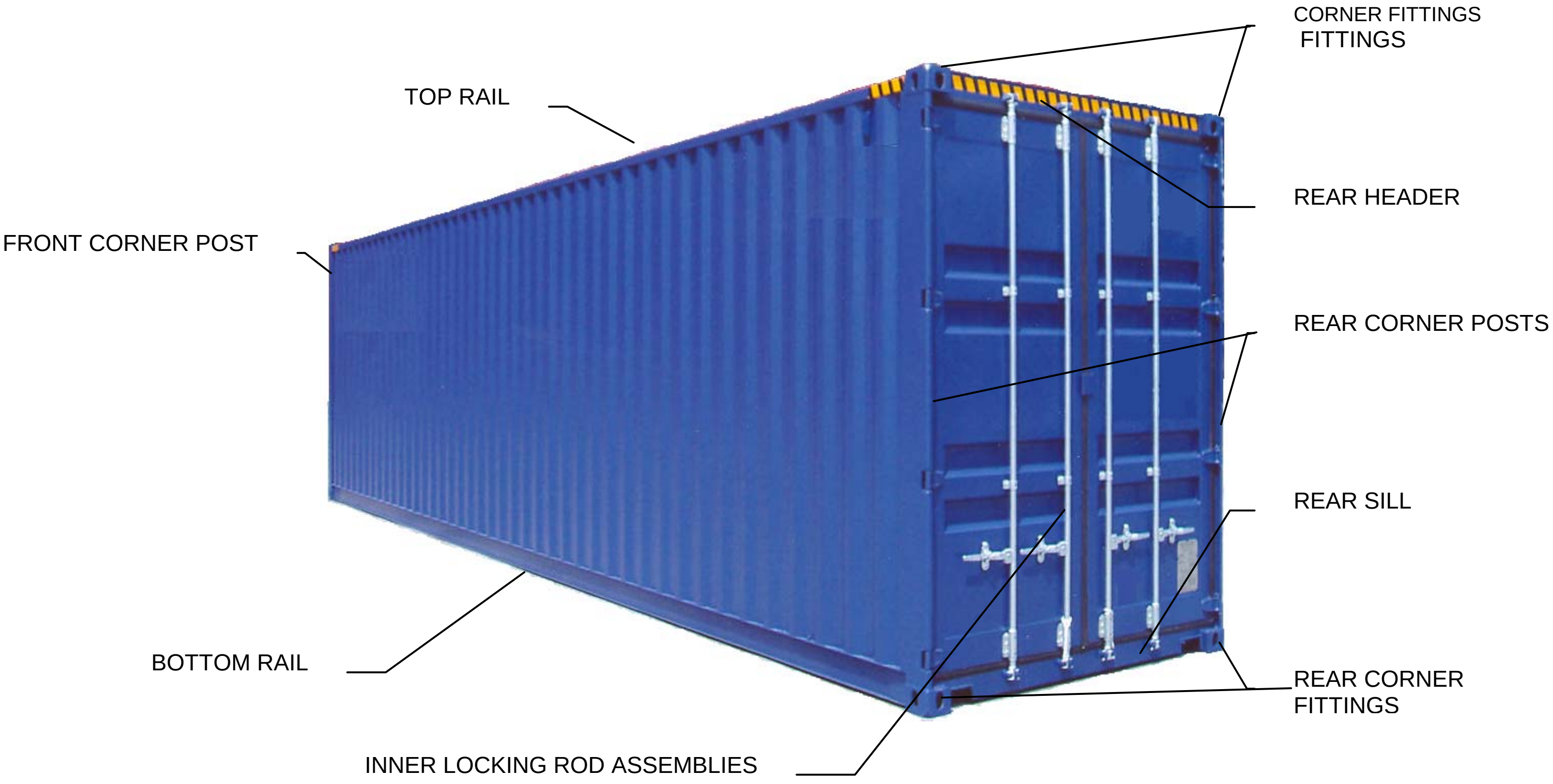

CORNER FITTINGS
FITTINGS
TOP RAIL
REAR HEADER
FRONT CORNER POST
REAR CORNER POSTS
REAR SILL
BOTTOM RAIL
REAR CORNER
FITTINGS
INNER LOCKING ROD ASSEMBLIES

Figure 1

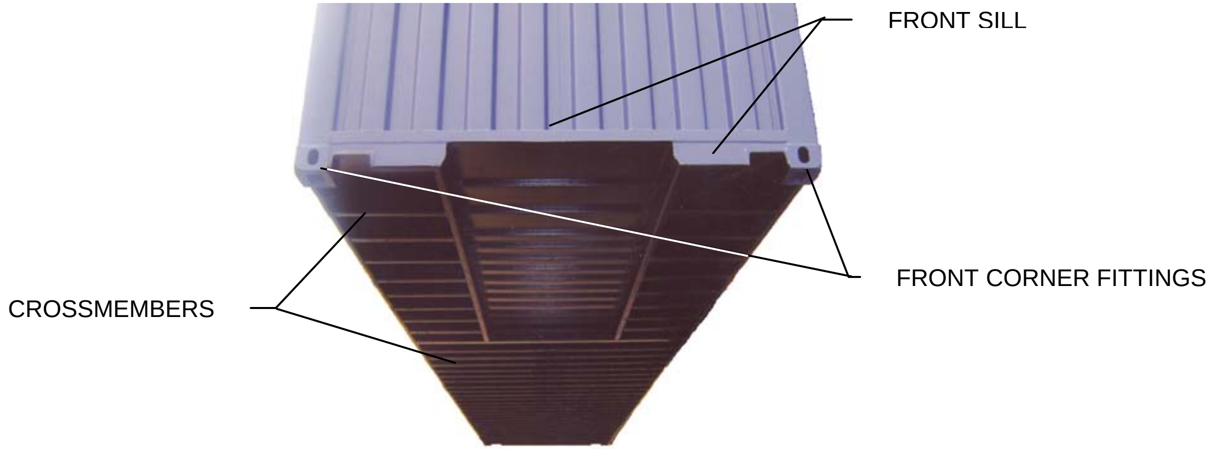


Figure 2

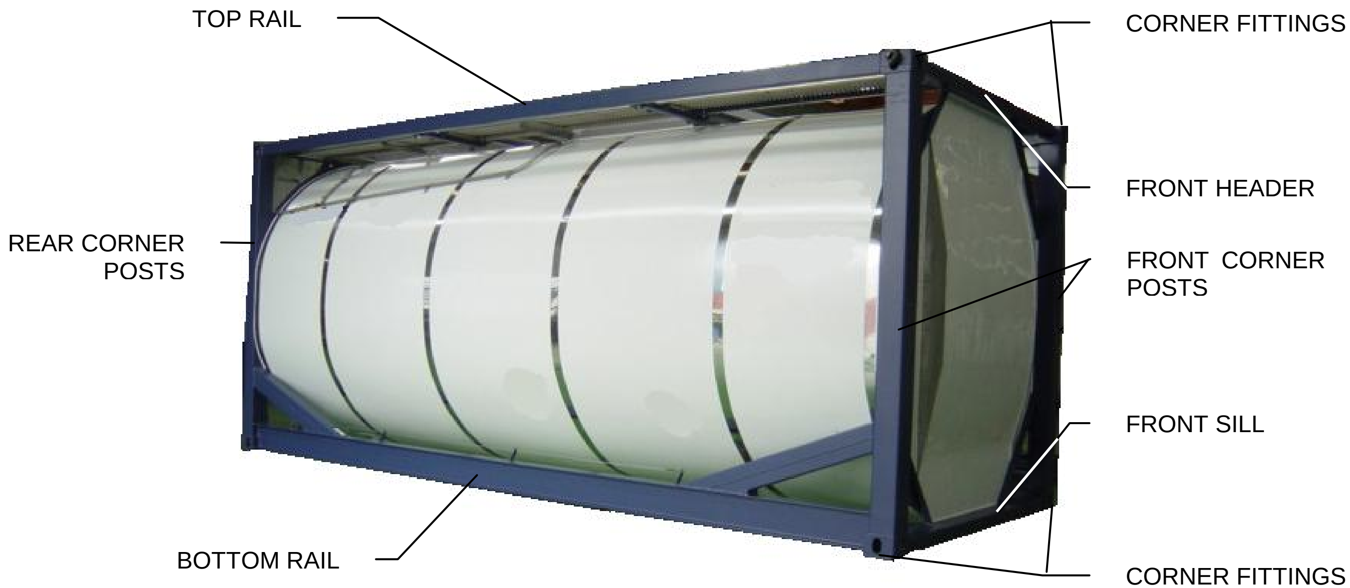
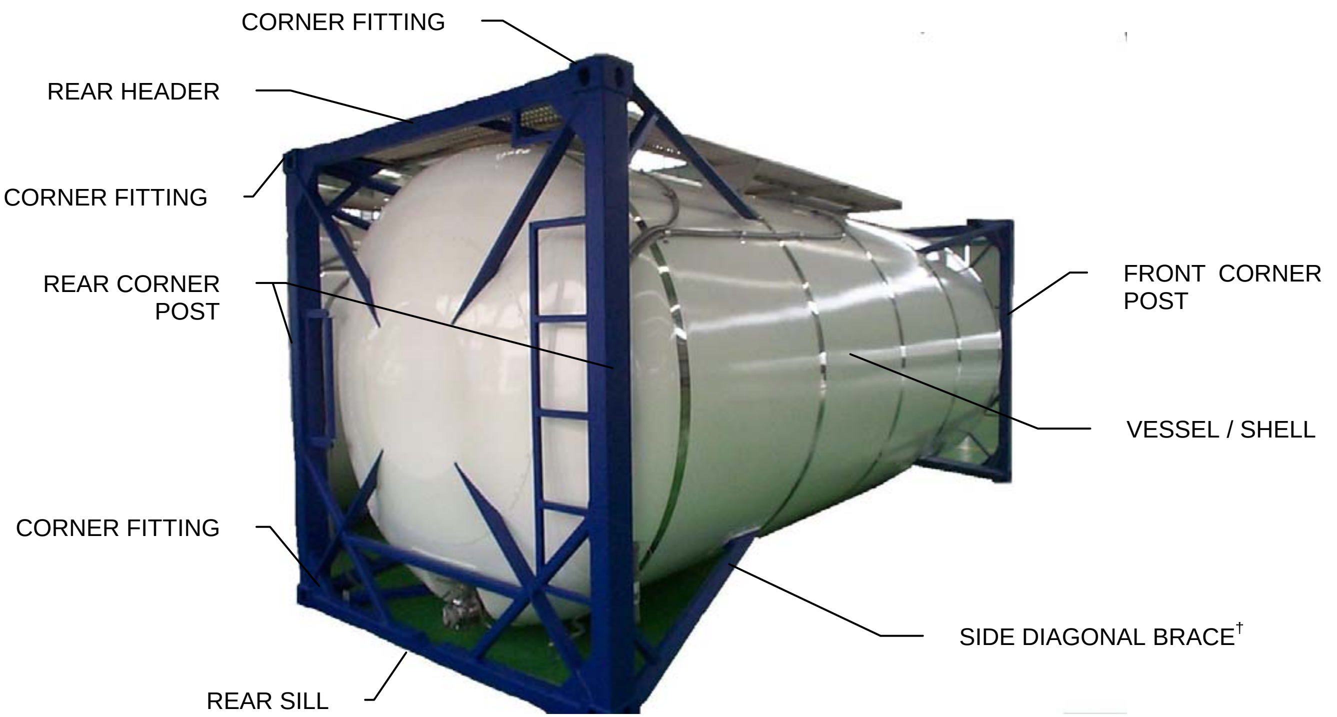

TOP RAIL
CORNER FITTINGS
FRONT HEADER
REAR CORNER POSTS
FRONT CORNER POSTS
FRONT SILL
BOTTOM RAIL
CORNER FITTINGS

Figure 3



† Treat as corner post

Figure 4

SERIOUS STRUCTURAL DEFICIENCIES IN CONTAINERS

Control flow chart for use by Authorized Control Officers

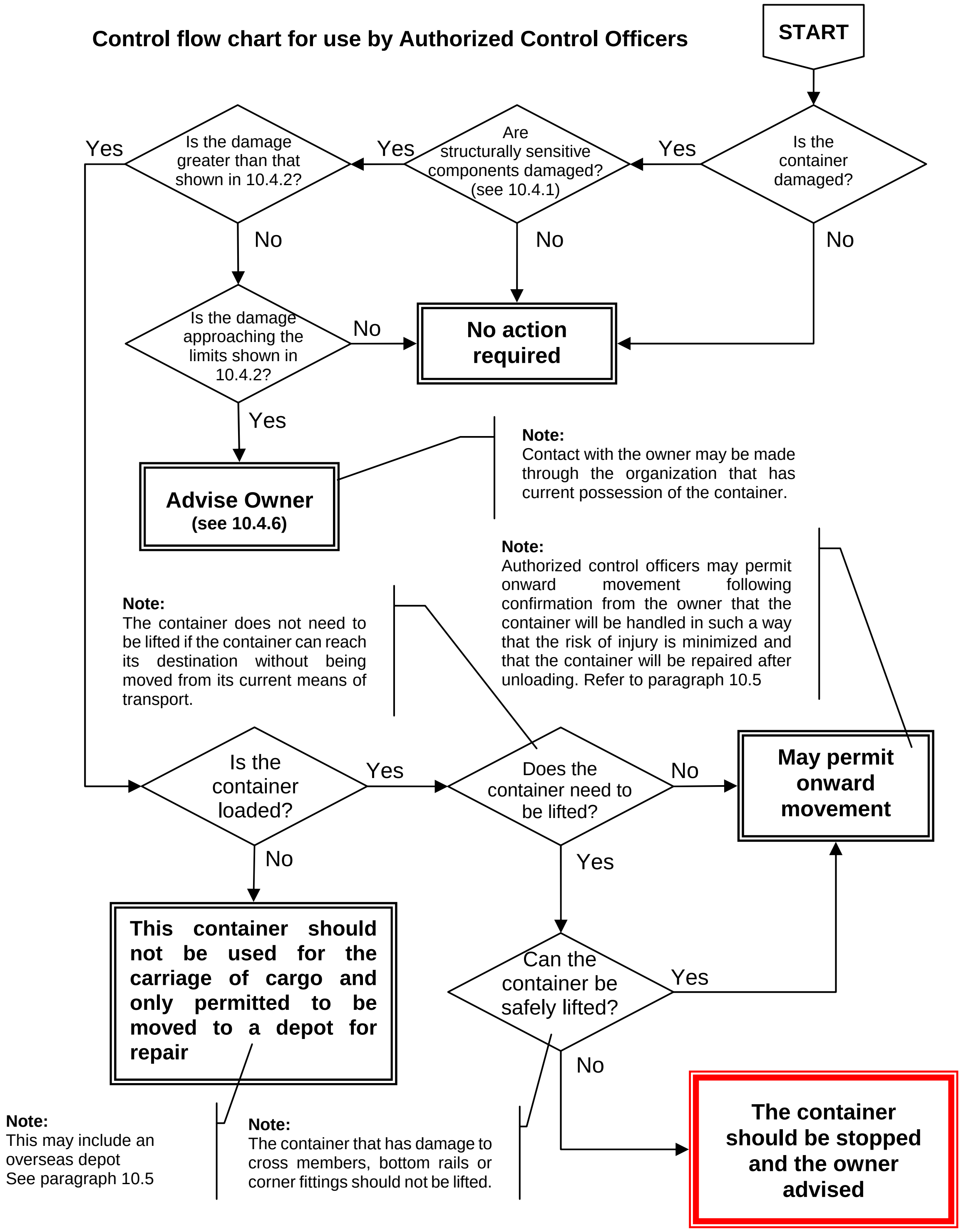


Figure 5

10.4.2 The effect of two or more items of damage in the same structurally sensitive component, even though each is less than that specified in the above table, could be equal to, or greater than, the effect of a single item of damage listed in the table. In such circumstances, the control officer may stop the container and seek further guidance from the Contracting Party.

10.4.3 For tank containers, the attachment of the shell to the container frame should also be examined for any readily visible serious structural deficiency comparable to that specified in the table. If any such serious structural deficiency is found in any of these attachments, the control officer should stop the container.

10.4.4 The end frame locking mechanism of platform containers with folding end frames and the hinge pins about which the end frame rotates are structurally sensitive components and should also be inspected for significant damage. Containers with folding end walls that cannot be locked in the erect position should not be moved with the end walls erect.

10.4.5 The deficiencies listed in paragraph 10.4.1 are not exhaustive for all types of containers or all possible deficiencies or combination of deficiencies.

10.4.6 When an authorized control officer is concerned that a container is found to be approaching the limit of a serious structural deficiency the officer should advise the owner to take precautions as necessary to allow container movement.

10.5 International movement of containers under control

It is recognized that in any of the cases covered by this section the owner may wish to move a container to another territory where the appropriate corrective action can be more conveniently carried out. Control officers may permit such movements, but should take such measures as may be reasonably practicable to ensure that the movement is carried out safely and that the appropriate corrective action is indeed taken. In particular, the control officer permitting such a movement should consider whether it would be necessary to inform the control officer or officers in the other territory or countries through which the container is to be moved.

10.6 Notification concerning unsafe containers of a given approved series

If a considerable number of containers in a given approved series is found to be unsafe as a result of defects which may have existed prior to approval (article VI, paragraph 2), Administrations should notify the Organization as well as the Contracting Party concerned.

10.7 Containers that are not defective but have no Safety Approval Plate or that have an incorrectly completed plate

Containers that have no Safety Approval Plate or an incorrectly completed Safety Approval Plate should be stopped. However, where evidence can be produced either to the effect that such a container has been approved under the terms of the Convention or to the effect that such a container meets the standards of the Convention, the authority exercising control may permit the container to proceed to its destination for unloading, with the proviso that it shall be plated as expeditiously as may be practicable and not reloaded before it has been correctly plated under the Convention.

10.8 Containers that are "out of date"

A container being maintained under a Periodic Examination Scheme (PES) that is found to have marked on or near to its Safety Approval Plate a next maintenance examination date that is in the past should be stopped. However, the competent authority exercising control may permit the container to proceed to its destination for unloading with the proviso that it should be examined and updated as expeditiously as may be practicable and not reloaded before this has been done.

10.9 Containers that are missing their ACEP or NED marking

When there is neither a NED nor an ACEP marking on or near the Safety Approval Plate, the container should be stopped until it can be proven that the container is being operated and maintained under a valid programme. If the container is being operated under an approved ACEP the container should be allowed to continue its journey and the operator should be notified. The missing marking should be applied after unloading the container at the final destination and prior to its next reloading or at its next interchange, whichever is earlier.

10.10 Containers with defects when approved

Where a container appears to have become unsafe as a result of a defect that may have existed when the design of the container was approved, the Contracting Party that detected the defect should inform the Administration responsible for that approval.

11 SAFETY APPROVAL PLATE (regulation 1)

11.1 The following approaches to complying with certain aspects of the data requirements of the Convention, listed in this section, are deemed to be in conformity therewith.

11.2 A single approval number may be assigned to each owner for all existing containers in a single application for approval which could be entered on line 1 of the plate.

11.3 The example given in line 1 of the model Safety Approval Plate (see appendix to Annex I of the Convention) should not be construed to require the inclusion of the date of approval in the approval reference.

11.4 The appendix to Annex I of the Convention allows the use of the owner's ISO alphanumeric identification codes or manufacturer's serial numbers on existing containers. Only the manufacturer's serial number should be used as the identification number (line 3) on the Safety Approval Plate for containers approved on or after 14 May 2010. Where the Safety Approval Plate forms part of a larger grouped or consolidated plate (see paragraph 10.9) the manufacturer's serial number may be marked elsewhere on that plate. The owner's ISO alphanumeric identification code may also be shown elsewhere on a consolidated plate.

11.5 Where marking of the end-wall or side-wall strength on the plate is not required (e.g., a container with the end-wall or side-wall strength equal to 0.4P or 0.6P, respectively) a blank space need not be retained on the Safety Approval Plate for such marking but can be used instead to meet other data requirements of the Convention, e.g., subsequent date marks.

11.6 Where end-wall or side-wall strength is required to be marked on the Safety Approval Plate, this should be done as follows:

- in the English language:

  END-WALL STRENGTH
  SIDE-WALL STRENGTH

- in the French language:

  RÉSISTANCE DE LA PAROI D'EXTRÉMITÉ
  RÉSISTANCE DE LA PAROI LATÉRALE

11.7 In cases where a higher or lower wall strength is to be marked on the Safety Approval Plate, this can be done briefly by referring to the formula related to the payload P.

Example: **SIDE-WALL STRENGTH 0.5P**

11.8 With respect to the material characteristics of the Safety Approval Plate (see appendix to Annex I of the Convention), each Administration, for purposes of approving containers, may define *permanent, non-corrosive* and *fireproof* in its own way or simply require that Safety Approval Plates be of a material which it considers meets this definition (e.g., a suitable metal).

11.9 Regulation 1 of Annex I requires that the Safety Approval Plate be affixed adjacent to any approval plate issued for official purposes. To comply with this requirement, when practicable, the CSC Safety Approval Plate may be grouped with the data plates required by other international conventions and national requirements on one base plate. The base plate should be conveniently located on the container.

11.10 For the purposes of this Convention, the word *weight* is considered to be equivalent to the word *mass*, and therefore can be used on the Safety Approval Plate. Beginning 14 May 2010, the word **MASS** should replace **WEIGHT** on plates fitted to containers.

12 MAINTENANCE AND EXAMINATION PROCEDURES (regulation 2)

12.1 The Convention allows owners the option of having containers examined at intervals specified in the Convention in accordance with an examination scheme prescribed or approved by the Administration concerned, as set out in regulation 2, paragraph 2, and hereinafter referred to as "PERIODIC EXAMINATION SCHEME", or under a continuous examination programme approved by the Administration concerned, as set out in regulation 2, paragraph 3, and hereinafter referred to as "CONTINUOUS EXAMINATION PROGRAMME".

12.2 Both procedures are intended to ensure that the containers are maintained to the required level of safety and both should be considered equal, provided the Administration is satisfied with the examination scheme used by the owner.

12.3 The owner should be allowed the option of having part of his fleet covered by one examination procedure and the remaining part of his fleet covered by the other procedure, and provision should be made to allow an owner to change the procedure applicable to their containers.

12.4 Elements to be included in the examination

12.4.1 ***For containers covered by periodic examination schemes or continuous examination programmes***

12.4.1.1 While Administrations may specify factors to be taken into account in a container examination scheme, it should not be necessary at this time to agree on a specific list of factors or minimum listing of parts of a container which should be included in an examination. However, each examination should include a detailed visual inspection for defects or other safety-related deficiencies or damage which will render the container unsafe and include examination of all structurally significant components of the container, particularly the corner fittings.

12.4.1.2 It is accepted that a visual examination of the exterior of the container will normally be sufficient. However, an examination of the interior should also be performed if reasonably practicable (e.g., if the container is empty at the time). Furthermore, the top and underside of the container, including the underside of the lower corner fittings, should be examined. This may be done either with the container supported on a skeletal chassis or, if the examiner considers it necessary, after the container has been lifted on to other supports.

12.4.1.3 The examination of a container should be carried out by a person having such knowledge and experience of containers as will enable him to determine whether it has any defect that could place any person in danger.

12.4.1.4 The person performing the external examination should have the authority to require a more detailed examination of a container if the condition of the container appears to warrant such examination. If there is a possibility of serious structural deficiency in structurally sensitive components (see 10.4 above), measuring tools to fully assess the defects that are noted should be used.

12.4.2 ***Additional requirements for containers under a continuous examination programme***

12.4.2.1 Under an approved continuous examination programme a container is subject to examinations and inspections during the course of normal operations. These are:

.1 *thorough examinations*, which are examinations conducted in connection with a major repair, refurbishment, or on-hire/off-hire or depot interchange; and

.2 *routine operating inspections*, which are frequent inspections performed to detect any damage or deterioration that might necessitate corrective action.

12.4.2.2 Thorough examinations should be carried out in accordance with the requirements of the approved examination programme and care should be taken to ensure that any damaged parts or components have been adequately and safely repaired or replaced. Although Administrations may specify factors to be taken into account during routine operating inspections, normally a visual inspection of the exterior and the underside should be sufficient.

12.4.3 ***Container markings for examinations***

12.4.3.1 *Containers under a periodic examination scheme – next examination date (NED)*

12.4.3.1.1 The use of decals should be allowed to indicate the date of the first examination and subsequent re-examination of a container examined at intervals specified in the Convention provided that:

.1 the relevant date (month and year) is shown in internationally recognizable words or figures on the decals or on the plate itself;

.2 the date of the first examination for new containers is shown by decals or otherwise on the plate itself as regulation 2.2 of Annex I of the CSC requires; and

.3 the decals have a white background with lettering that may be coloured in accordance with the year of next examination as follows:

BROWN	2004	2010	2016
BLUE	2005	2011	2017
YELLOW	2006	2012	2018
RED	2007	2013	etc.
BLACK	2008	2014	
GREEN	2009	2015	

12.4.3.2 *Containers under a continuous examination programme*

12.4.3.2.1 A container examined under an approved continuous examination programme should bear a decal showing the letters ACEP and the identification of the Administration which has granted the approval, in a similar manner to that stated in Annex I, appendix 1, paragraph 1. This decal should be placed on or as close as practicable to the Safety Approval Plate.

12.4.4.3 *Containers operated by a lessee*

12.4.4.3.1 Containers marked with an NED but operated by a lessee with an approved continuous examination programme should be re-marked by the fitting of the lessee's ACEP reference decal and removal or covering of the next examination date.

12.4.4.3.2 Containers marked with an ACEP reference but operated by a lessee with a Periodic Examination Scheme (PES) should be re-marked by the removal or covering of the ACEP reference and the fitting of an NED decal following the first examination under the lessee's examination scheme.

12.4.4.4 *For containers built with limited stacking or racking capacity*

Containers tested in accordance with Annex II, chapter 2 (Stacking) with an allowable superimposed static stacking weight less than 192,000 kg for their outer most corner posts, or tested in accordance with Annex II, chapter 4 (Transverse Racking) with forces less than 150 kN, should be conspicuously marked, as required under the relevant ISO standard*.

12.4.5 ***Use of decals***

The use of decals for containers under a periodic examination scheme should remain optional and in no way derogate from the relevant provisions of the Convention to which reference is made above. The responsibility for developing and introducing a decal system should remain with the owners.

13 RECORDS OF EXAMINATIONS

13.1 The owner should ensure a system is maintained where examination records are kept, which should include the following:

.1 the owner's unique serial number of the container;

.2 the date on which the examination was carried out;

.3 identification of the competent person who carried out the examination;

* Refer to current standard ISO 6346, Freight containers – Coding, identification and marking.

.4 the name and location of the organization where the examination was carried out;

.5 the results of the examination; and

.6 in the case of a PES, the NED.

13.2 There is no need to standardize the method by which such records should be kept and existing record systems may be accepted. Such records should be auditable and made available within a reasonable time to the Administration on its request. There is no requirement to keep records of routine operating inspections.

14 FREQUENCY OF EXAMINATIONS

14.1 Containers under a periodic examination scheme

14.1.1 The Convention recognizes that it may be necessary to examine containers more frequently than every 30 months when they are subject to frequent handling and transshipment. It should be borne in mind, however, that any significant reduction in the 30-month interval between examinations would create severe examination control problems. It should be noted that where containers are subjected to frequent handling and transshipment they are also liable to be subjected to frequent checking.

14.1.2 Therefore, in determining whether it is acceptable that the interval between examinations under the Convention should be the maximum of 30 months, proper account should be taken of intermediate examinations, having regard to their extent and to the technical competence of the persons by whom they are performed.

14.2 Containers under a continuous examination programme

14.2.1 Containers examined under an approved continuous examination programme are subject to a thorough examination in connection with a major repair, refurbishment or on-hire/off-hire or depot interchange and in no case less than once every 30 months.

15 MODIFICATIONS OF EXISTING CONTAINERS

15.1 Applicants for approval of existing containers may be required to certify that, to the best of their knowledge, any modifications previously carried out do not adversely affect safety or the relevance to those containers of the information presented with the application in accordance with Annex I, regulation 9, paragraph 1(d)(ii) and (iii). Alternatively, applicants may submit details of the modification for consideration.

15.2 The removal of a door of a container to enable "one door operation" is considered to be a modification that may adversely affect the safety of the container. Consequently it requires specific approval by the Contracting Party and appropriate markings on the CSC Plate, which must remain on the container after the door has been removed.

15.3 Containers that have been subjected to a modification should retain the original date of manufacture on the Safety Approval Plate and add an additional line showing the date when the modification was carried out.

16 TEST METHODS AND REQUIREMENTS (Annex II)

Containers tested in accordance with the methods described in the relevant ISO standard* should be deemed to have been fully and sufficiently tested for the purposes of the Convention, except that tank-containers provided with fork-lift pockets should be additionally tested in accordance with Annex II, test 1(B)(i).

17 STACKING TEST (Annex II, chapter 2)

17.1 The following can be used as guidance in interpreting paragraphs 1 and 2 of the stacking test:

> For a 9-high stacking of 24-ton (24,000 kg/52,915 lb) containers, the mass on the bottom container would be 8 x 24 tons (24,000 kg/52,915 lb), i.e. 192 tons (192,000 kg/423,320 lb). Thus, in the case of a 24-ton container with 9-high stacking capability, the plate should indicate: **ALLOWABLE STACKING MASS FOR 1.8 G: 192,000 kg/423,320 lb**.

17.2 The following may be useful guidance for determining allowable stacking mass:

> The allowable stacking mass for 1.8 g may be calculated by assuming a uniform stack loading on the corner post. The stacking test load applied to one corner of the container shall be multiplied by the factor 4/1.8 and the result expressed in appropriate units.

17.3 The following is a useful example of how the allowable stacking mass could be varied, as prescribed in paragraph 1 of the stacking test:

> If on a particular journey the maximum vertical acceleration on a container can be reliably and effectively limited to 1.2 g, the allowable stacking mass permitted for that journey would be the allowable stacking mass stamped on the plate multiplied by the ration of 1.8 to 1.2 (i.e. allowable stacking mass on the plate x 1.8/1.2 = stacking mass permitted for the journey).

18 LONGITUDINAL RESTRAINT TEST (STATIC TEST) (Annex II, chapter 5)

The acceleration of 2 g should be considered as the usual value for dynamic loads on containers in normal operation when carried by inland modes of transport. The externally applied test forces of 2 R prescribed for the static test for longitudinal restraint, together with the fulfilment of the criteria of the other prescribed tests, are to ensure that the structural strength of a container is sufficient to withstand the stresses resulting from normal operation.

19 VALIDITY OF APPROVALS

Approvals remain valid if the Contracting Party issuing the approval changes provided the new entity agrees to maintain responsibility for the proper administration of the Convention and the existing approvals. Approvals also remain valid when container ownership changes provided the new owner continues to maintain the container to a standard and under procedures that are at least as effective as those originally approved.

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* Refer to current ISO 1496, Series 1 freight containers – Specification and testing.

INTERNATIONAL MARITIME ORGANIZATION

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MSC-MEPC.2/Circ.9
25 May 2010

GUIDANCE FOR THE APPLICATION OF SAFETY, SECURITY AND ENVIRONMENTAL PROTECTION PROVISIONS TO FPSOs AND FSUs

1 The Marine Environment Protection Committee, at its fifty-ninth session (13 to 17 July 2009) and the Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), recognizing that there is a need to provide guidance to Member States such that they may develop regulations on safety, pollution prevention and security of Floating Production Storage and Offloading Facilities (FPSOs)/Floating Storage Units (FSUs), approved the guidance, as set out in the annex, with a view to providing more clear and specific information, for the application of safety, security and environmental protection provisions to FPSOs and FSUs.

2 Member Governments are invited to use the annexed guidance when applying relevant provisions of the SOLAS Convention, including requirements contained in the ISM Code, the Load Lines Convention, MARPOL Convention and the STCW Convention and to bring it to the attention of all parties concerned.

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ANNEX

GUIDANCE FOR THE APPLICATION OF SAFETY, SECURITY AND ENVIRONMENTAL PROTECTION PROVISIONS TO FPSOs AND FSUs

General

1 This circular intends to provide guidance to Member States such that they may develop regulations on safety, pollution prevention and security of Floating Production Storage and Offloading Facilities/Floating Storage Units (FPSOs/FSUs). In the vast majority of cases an adequate safety and pollution prevention regime established by national legislation exists based on provisions of the SOLAS Convention, including requirements contained in the ISM Code, the Load Lines Convention, MARPOL Convention and the STCW Convention, implemented together with exemptions, and industry guidelines.

2 The circular also provides guidance to industry with a view to improving safety, pollution prevention and security of FPSOs/FSUs through recommendations concerning competence of marine operations personnel, manning, safety management systems, operations off location, security, pollution prevention and emergency response of FPSOs/FSUs.

Jurisdiction and administration

3 In reviewing the current safety regime for FPSOs/FSUs, it is essential to recognize the sovereign rights that the coastal State has over:

.1 non-disconnectable FPSOs/FSUs, which are designed to be permanently moored in the waters under the jurisdiction of the coastal State and have no mechanical means to transit under their own propulsion; and

.2 disconnectable FPSOs/FSUs, self-propelled or non-propelled, while operating on location.

4 Flag States and coastal States should cooperate with a view to ensuring the compliance of FPSOs/FSUs with applicable international standards on maritime safety, marine environment protection, enforcement and control measures such as survey and certification, maritime search and rescue, casualty investigation and emergency response.

Principle of application

5 Compliance with relevant Conventions such as SOLAS (including the ISM Code), Load Lines, STCW and MARPOL, Assembly resolutions[1] and industry guidelines[2,3] contribute from different perspectives to safety and pollution prevention of FPSOs/FSUs, being disconnectable or non-disconnectable, self-propelled or non-propelled. Therefore a comprehensive and pragmatic approach should be taken when considering the applicability of the above-mentioned instruments and documents to FPSOs/ FSUs given their unique operations.

1 Recommendations on Training of Personnel on Mobile Offshore Units (MOUs), resolution A.891(21).
2 Competence Assurance Guidelines for FPSOs, developed by OCIMF.
3 Guidelines for Managing Marine Risks Associated with FPSOs, developed by OGP.

Operations on location

6 For both disconnectable and non-disconnectable units, the SOLAS, STCW and the Load Line Conventions do not apply as the FPSO/FSU is neither underway nor engaged in an international voyage. However, the Annexes of MARPOL apply in light of the definition of a ship in article 2(4) of the MARPOL Convention, which includes floating platforms, and the general applicability of the Convention to ships not engaged in international voyages. MARPOL Annex I should be applied to the extent recommended by resolutions MEPC.139(53) and MEPC.142(54).

7 To ensure that disconnectable self-propelled FPSOs/FSUs can be readily and efficiently disconnected in the event of severe environmental conditions, it is recommended that they should possess a level of safety equivalent to that afforded by the SOLAS and Load Line Conventions. In instances where hardware and arrangements of marine-related systems are impacted by production systems, arrangements which may be more properly addressed by other standards (e.g., based on the MODU Code) may be accepted by the flag State with the concurrence of the coastal State.

8 An approved safety management system, including a maintenance programme particularly for essential marine systems and equipment, should remain effective at all times[3,4,5]. Competence of onboard personnel, both marine and production, should be maintained to an adequate level[2].

Operations off location

9 Depending on the mooring and riser system capabilities relative to selected design environmental conditions at the location under question, it may be necessary for self-propelled FPSO/FSUs to disconnect and move off location to avoid adverse environmental conditions/loads. Additionally, FPSOs/FSUs may need to be taken off location for dry-docking, repair or maintenance work.

10 When it is necessary to disconnect and undertake an international voyage under its own propulsion (e.g., the FPSO/FSU is flying the flag of a State other than the coastal State in whose waters the FPSO is transiting), it would therefore be subject to the SOLAS (including ISM), STCW, and Load Line Conventions, in addition to MARPOL.

11 In such cases where it is necessary to disconnect, attention is drawn to SOLAS article IV and regulation I/4(a) in the event that limited exemptions from the requirements for physical arrangements or hardware are deemed appropriate.

Security

12 In order to facilitate the interaction between FPSOs/FSUs and other ships, FPSOs/FSUs should comply with SOLAS chapter XI-2 and the ISPS Code, as applicable[6].

Emergency response

13 An emergency response procedure is recommended to be developed for the FPSO/FSU to address the safety and pollution risks associated with marine and production systems and operations, taking into account the MARPOL Convention, the ISM Code and appropriate guidelines.

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[4] International Safety Management Code.

[5] American Petroleum Institute API 75 Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities.

[6] MSC/Circ.1111.

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MSC.1/Circ.1349
1 June 2010

HIGH-SPEED CRAFT (HSC) COMPLIANCE WITH THE PROVISIONS OF SOLAS REGULATIONS V/18 TO V/20 AND CHAPTER 13 OF THE 2000 HIGH-SPEED CRAFT CODE

1 The Maritime Safety Committee (MSC), at its eighty-seventh session (12 to 21 May 2010), approved the declaration of High-Speed Craft (HSC) Compliance with the provisions of SOLAS regulations V/18 to V/20 and chapter 13 of the 2000 High-Speed Craft Code, as prepared by the Sub-Committee on Safety of Navigation (NAV) at its fifty-fifth session (27 to 31 July 2009).

2 Member Governments are invited to bring the information attached at annex to the attention of all parties concerned.

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ANNEX

HIGH-SPEED CRAFT (HSC) COMPLIANCE WITH THE PROVISIONS OF SOLAS REGULATIONS V/18 TO V/20 AND CHAPTER 13 OF THE 2000 HIGH-SPEED CRAFT (HSC) CODE

1 Due to the timing of the review and updating of IMO documentation, regulation requirements under the safe navigation provisions of the 2000 High-Speed Craft (HSC) Code are not keeping pace with technology. In practice this can be exacerbated by the time required for amendments to Class rules and those needing to follow changes in IMO documentation.

2 An unintended consequence of this situation is that the building of new HSC must continue to involve the duplication of equipment and the installation of large analogue individual indicators into small cockpit style bridge arrangements when the technology, including redundancy arrangements, would allow for integrated digital information to be displayed in a more user friendly, space efficient and ergonomic manner.

3 To overcome the difficulties mentioned above, High-Speed Craft may be equipped with navigation equipment and systems that take advantage of the latest technological developments permitted by regulations relating to SOLAS chapter V, e.g., standards for integrated navigation systems and alert management, provided that the equipment is of an equivalent or higher standard to the requirements of chapter 13 of the 2000 HSC Code, to the satisfaction of the Administration.

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LL.3/Circ.194
26 May 2010

UNIFIED INTERPRETATIONS OF THE 1966 LL CONVENTION AND THE 1988 LL PROTOCOL AS MODIFIED BY RESOLUTION MSC.143(77)

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), with a view to providing more specific guidance for application of the relevant requirements of the 1966 LL Convention and the 1988 LL Protocol, approved unified interpretations of the 1966 LL Convention and the 1988 LL Protocol as modified by resolution MSC.143(77), prepared by the Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety, at its fifty-second session, as set out in annexes 1 and 2, respectively.

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of the 1966 LL Convention and the 1988 LL Protocol, as modified by resolution MSC.143(77), to ships constructed on or after 21 May 2010 and to bring the unified interpretations to the attention of all parties concerned.

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ANNEX 1

UNIFIED INTERPRETATIONS OF THE 1966 LL CONVENTION

Regulation 24 – Freeing ports
Regulation 26 – Special conditions of assignment for type "A" ships

Where gutter bars are installed on the weather decks of tankers in way of cargo manifolds and are extended aft as far as the after house front for the purpose of containing cargo spills on deck during loading and discharge operations, the free surface effects caused by containment of a cargo spill during liquid transfer operations or of boarding seas while underway require consideration with respect to the ship's available margin of positive initial stability (GMo).

Where the gutter bars installed are greater than 300 mm in height, they should be treated as bulwarks according to the Load Line Convention with freeing ports arranged in accordance with regulation 24 and effective closures provided for use during loading and discharge operations. Attached closures should be arranged in such a way that jamming cannot occur while at sea, ensuring that the freeing ports will remain fully effective.

On ships without deck camber, or where the height of the installed gutter bars exceeds the camber, and for tankers having cargo tanks exceeding 60% of the ship's maximum beam at midships regardless of gutter bar height, gutter bars should not be accepted without an assessment of the initial stability (GMo) for compliance with the relevant intact stability requirement taking into account the free surface effect caused by liquids contained by the gutter bars.

Regulation 27(3) and (7) – Types of ships

The permeability assumed in the damage stability calculation for the flooding of any store space should be 0.95.

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ANNEX 2

UNIFIED INTERPRETATIONS OF THE 1988 LL PROTOCOL AS MODIFIED BY RESOLUTION MSC.143(77)

Regulation 24 – Freeing Ports
Regulation 26 – Special conditions of assignment for type "A" ships

Where gutter bars are installed on the weather decks of tankers in way of cargo manifolds and are extended aft as far as the after house front for the purpose of containing cargo spills on deck during loading and discharge operations, the free surface effects caused by containment of a cargo spill during liquid transfer operations or of boarding seas while underway require consideration with respect to the ship's available margin of positive initial stability (GMo).

Where the gutter bars installed are greater than 300 mm in height, they should be treated as bulwarks according to the Load Line Convention with freeing ports arranged in accordance with regulation 24 and effective closures provided for use during loading and discharge operations. Attached closures should be arranged in such a way that jamming cannot occur while at sea, ensuring that the freeing ports will remain fully effective.

On ships without deck camber, or where the height of the installed gutter bars exceeds the camber, and for tankers having cargo tanks exceeding 60% of the ship's maximum beam at midships regardless of gutter bar height, gutter bars should not be accepted without an assessment of the initial stability (GMo) for compliance with the relevant intact stability requirement taking into account the free surface effect caused by liquids contained by the gutter bars.

Regulation 27(3) and (8d) – Types of ships

The permeability assumed in the damage stability calculation for the flooding of any store space should be 0.95.

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SN.1/Circ.286
2 June 2010

ROUTEING MEASURES OTHER THAN TRAFFIC SEPARATION SCHEMES

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010) adopted, in accordance with the provisions of resolution A.858(20), the following new routeing measures other than traffic separation schemes including amendments to existing routeing measures other than traffic separation schemes, annexed hereto:

.1 new two-way route "Salvorev" in the waters north of Gotland island;

.2 new Area To Be Avoided and two new mandatory No Anchoring Areas in the vicinity of the proposed "Neptune deepwater port" in the western North Atlantic Ocean, off the coast of the United States;

.3 new deep-water route including associated routeing measures consisting of a traffic separation scheme, two Areas To Be Avoided and a precautionary area leading to the new Jazan Economic City Port (JEC Port); and

.4 amendments to the existing deep-water route leading to Ijmuiden.

2 The aforementioned routeing measures other than traffic separation schemes will be implemented as follows: routeing measure listed in subparagraphs 1.1 and 1.3 will be implemented at 0000 hours UTC on 1 January 2011; routeing measures listed in subparagraphs 1.2 and 1.4 at 0000 hours UTC on 1 December 2010.

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ANNEX

ROUTEING MEASURES OTHER THAN TRAFFIC SEPARATION SCHEMES

ESTABLISHMENT OF A NEW TWO-WAY ROUTE NORTH OF THE GOTLAND ISLAND, "SALVOREV"

(Reference chart: Swedish chart number SE731 edition 11/3-2008 in WGS 84.)

Description of the new two-way route north of the Gotland Island

"Salvorev"

A recommended two-way route is established within the following geographical positions:

(a) Northern limit:

(15) 57° 57´.70 N 018° 27´.61 E (16) 58° 08´.70 N 019° 18´.25 E

(b) Southern limit:

(17) 57° 53´.97 N 018° 25´.44 E (18) 58° 05´.92 N 019° 20´.36 E

ESTABLISHMENT OF A NEW AREA TO BE AVOIDED AND TWO NEW MANDATORY NO ANCHORING AREAS IN THE VICINITY OF THE PROPOSED NEPTUNE DEEPWATER PORT IN THE WESTERN NORTH ATLANTIC OCEAN

((Reference chart: United States 13009, 2007 edition; 13200, 2008 edition; 13260, 2007 edition; 13267, 2007 edition.)
Note: These charts are based on North American 1983 Datum which is equivalent to WGS 1984 datum.)

Description of an Area To Be Avoided and mandatory no anchoring areas

Area To Be Avoided

An area of approximately 3.97 nautical square miles contained within an oval of radius 1,250 metres vectored from the two centre positions for Neptune Buoys "A" and "B", respectively, an Area To Be Avoided for all ships except authorized ships is established in the area bounded as follows:

Starting at	(1) 42° 27′.44 N 070° 35′.22 W
A rhumb line to	(2) 42° 29′.31 N 070° 35′.59 W
Then an arc with a 1250 m radius centred at	(3) 42° 29′.21 N 070° 36′.50 W
To a Point	(4) 42° 29′.11 N 070° 37′.40 W
Then a rhumb line to	(5) 42° 27′.25 N 070° 37′.03 W
Then an arc with a 1250 m radius centred at	(6) 42° 27′.34 N 070° 36′.12 W
Then to point	(1) 42° 27′.44 N 070° 35′.22 W

Mandatory no anchoring areas

Two areas contained within a circle of radius 1,000 metres centred upon the following geographical positions are designated as no anchoring areas for all ships:

Northern STL Buoy – 42° 29′.23 N 070° 36′.50 W
Southern STL Buoy – 42° 27′.35 N 070° 36′.01 W

JEC PORT DEEP-WATER ROUTE

(Reference chart: British Admiralty Chart No.15, Ed. 2, 22 June 2000, based on WGS 84)

Description of the deep-water route and associated routeing measures

Description of the deep-water route

(a) A deep-water route is established bounded by a line connecting the following positions:

(2)	17° 01′.52 N	041° 21′.63 E	(12)	17° 15′.18 N	042° 11′.80 E
(3)	17° 07′.24 N	041° 24′.67 E	(13)	17° 10′.50 N	042° 13′.44 E
(4)	17° 13′.45 N	041° 34′.19 E	(14)	17° 04′.00 N	042° 07′.50 E
(5)	17° 17′.30 N	041° 43′.11 E	(15)	17° 05′.55 N	042° 03′.97 E
(6)	17° 16′.34 N	041° 43′.83 E	(16)	17° 19′.25 N	041° 43′.99 E
(7)	17° 02′.35 N	042° 02′.07 E	(17)	17° 14′.60 N	041° 33′.23 E
(8)	17° 00′.50 N	042° 07′.93 E	(18)	17° 09′.45 N	041° 23′.59 E
(9)	17° 03′.34 N	042° 08′.88 E	(19)	17° 02′.48 N	041° 19′.90 E
(10)	17° 10′.50 N	042° 15′.44 E		Thence back to the point of origin (2)	
(11)	17° 15′.27 N	042° 14′.28 E			

Description of associated routeing measures

Description of the traffic separation scheme

(b) A separation zone is bounded by the lines connecting the following geographical positions:

(21)	16° 56′.48 N	041° 17′.16 E	(24)	17° 02′.20 N	041° 20′.489 E
(22)	16° 56′.13 N	041° 17′.70 E		Thence back to the point of origin (21)	
(23)	17° 01′.87 N	041° 20′.98 E			

(c) A traffic lane for northbound traffic is established between the separation zone (b) and a line connecting the following geographical positions:

(1)	16° 55′.72 N	041° 18′.42 E	(2)	17° 01′.52 N	041° 21′.63 E

(d) A traffic lane for southbound traffic is established between the area to be avoided (e) and a line connecting the following geographical positions:

(19)	17° 02′.48 N	041° 19′.90 E	(20)	16° 56′.74 N	041° 16′.59 E

Description of the Areas To Be Avoided

(e) An Area to be Avoided, 650 m in radius, is centred upon the following geographical position:

(25) 17° 08′.34 N 041° 24′.34 E

(f) An Area To Be Avoided, 650 m in radius, is centred upon the following geographical position:

(26) 17° 10′.38 N 041° 53′.96 E

Description of the Precautionary Area

(g) A Precautionary Area is established bounded by a line connecting the following positions:

(7)	17° 02′.35 N	042° 02′.07 E	(14)	17° 04′.00 N	042° 07′.50 E
(8)	17° 00′.50 N	042° 07′.93 E	(15)	17° 05′.55 N	042° 03′.97 E
(9)	17° 03′.34 N	042° 08′.88 E		Thence back to the point of origin (7)	

Note: The controlling depth for the deep-water route has been set at 27 metres.

AMENDED "DEEP-WATER ROUTE LEADING TO IJMUIDEN"

(Reference Chart: Netherlands 1631 (INT 1418), Edition 2, dated 20 July 2006)
Note: This chart is based on World Geodetic System 1984 (WGS 84)

Description of the amended deep-water route

The deep-water route consists of a deep-water channel (IJ-geul) and a deep-water approach area (IJ-geul approach area):

Deep-water channel (IJ-geul)

(a) The specific deep-water channel is bounded by a line connecting the following geographical positions:

(1)	52º 28´.10 N	004º 32´.02 E
(2)	52º 30´.38 N	004º 11´.84 E
(3)	52º 30´.26 N	003º 54´.91 E
(8)	52º 29´.94 N	003º 54´.91 E
(9)	52º 30´.06 N	004º 12´.49 E
(10)	52º 27´.86 N	004º 31´.95 E

Deep-water approach area (IJ-geul approach area)

(b) The deep-water approach area is bounded by a line connecting the following geographical positions:

(3)	52º 30´.26 N	003º 54´.91 E
(4)	52º 31´.40 N	003º 54´.91 E
(5)	52º 31´.73 N	003º 48´.41 E
(6)	52º 27´.38 N	003º 41´.25 E
(7)	52º 28´.54 N	003º 54´.91 E
(8)	52º 29´.94 N	003º 54´.91 E

Notes:

.1 *Least water depths*

Limiting depths in the route should be ascertained by reference to the latest large-scale navigational charts of the area, noting that the charted depths are checked and maintained by frequent surveys and dredging.

.2 *Admission policy for the "Deep-water channel leading to Ijmuiden"*:

.1 Maximum allowed draught for entering IJmuiden is 17.80 m;

.2 Vessels with a draught of more than 14.10 m and up to the maximum allowed draught of 17.80 m are provided with a mandatory tidal window;

.3 Channel bound vessels must, if necessary, make use of the deep-water anchorage on the southwestern side of the deep-water approach area;

.4 Channel bound vessels must wait for pilotage in the deep-water approach area (IJ-geul Approach Area) west of the IJM-buoy; and

.5 If due to unforeseen circumstances the transit of the deep-water channel must be broken off, channel bound vessels must reverse course and proceed to the deep-water approach area by way of the deep-water channel, preferably by making use of the emergency turning basin approximately 5 nm west of port entrance.

.3 *Traffic Centre IJmuiden*

Traffic Centre IJmuiden can be reached on VHF channel 07. Traffic Centre IJmuiden will provide tidal windows for vessels with a draught of more than 14.10 m.

.4 The deep-water anchorage is bounded by a line connecting the following geographical positions:

(11)	52º 27´.57 N	003º 43´.53 E
(12)	52º 26´.38 N	003º 43´.80 E
(13)	52º 26´.81 N	003º 48´.89 E
(14)	52º 28´.00 N	003º 48´.62 E

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SN.1/Circ.286/Corr.1
16 June 2010
ENGLISH ONLY

ROUTEING MEASURES OTHER THAN TRAFFIC SEPARATION SCHEMES

The following corrections should be made to SN.1/Circ.286:

Annex

Page 2

JEC PORT DEEP-WATER ROUTE

Description of associated routeing measures

Description of the traffic separation scheme

Sub-section (d) should read as follows:

(d) A traffic lane for southbound traffic is established between the [*]~~area to be avoided (e)~~ separation zone (b) and a line connecting the following geographical positions:

(19)	17° 02′.48 N	041° 19′.90 E	(20)	16° 56′.74 N	041° 16′.59 E

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[*] Strikeout = old text
Grey shade = new text.

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Ref. T2-OSS/2.7.1

SN.1/Circ.287
2 June 2010

MANDATORY SHIP REPORTING SYSTEMS

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), adopted resolutions MSC.300(87) and MSC.301(87), as attached to this circular, in accordance with the provisions of Assembly resolution A.858(20), adopting amendments to existing mandatory ship reporting systems, as follows:

.1 In the Strait of Gibraltar (GIBREP) (amended system); and

.2 The Western European Particularly Sensitive Sea Area (WETREP) (amended system).

2 The amendments to the existing mandatory ship reporting systems for "In the Strait of Gibraltar" and "The Western European Particularly Sensitive Sea Area" will be implemented at 0000 hours UTC on 1 December 2010.

3 Member Governments are requested to bring the attached information to the attention of masters of ships under their flags and advise them that they are required to comply with the requirements of the adopted ship reporting systems, in accordance with regulation V/11.7 of the International Convention for the Safety of Life at Sea, 1974, as amended.

***

ANNEX 1

RESOLUTION MSC.300(87)
(adopted on 17 May 2010)

ADOPTION OF AMENDMENTS TO THE EXISTING MANDATORY SHIP REPORTING SYSTEM "IN THE STRAIT OF GIBRALTAR" (GIBREP)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO regulation V/11 of the International Convention for the Safety of Life at Sea, 1974 (SOLAS Convention), in relation to the adoption of ship reporting systems by the Organization,

RECALLING FURTHER resolution A.858(20) resolving that the function of adopting ship reporting systems shall be performed by the Committee on behalf of the Organization,

TAKING INTO ACCOUNT the guidelines and criteria for ship reporting systems adopted by resolution MSC.43(64), as amended by resolutions MSC.111(73) and MSC.189(79),

TAKING FURTHER INTO ACCOUNT that, in addition, to the existing operational Tarifa Vessel Traffic Services (VTS), the newly established Tangier Vessel Traffic Services (VTS) had also become operational with effect from 4 January 2010,

HAVING CONSIDERED the recommendations of the Sub-Committee on Safety of Navigation at its fifty-fifth session,

1. ADOPTS, in accordance with SOLAS regulation V/11, the amendments to the existing mandatory ship reporting system "In the Strait of Gibraltar" (GIBREP), as given at Annex;

2. DECIDES that the said amendments to the existing mandatory ship reporting system "In the Strait of Gibraltar" (GIBREP) will enter into force at 0000 hours UTC on 1 December 2010; and

3. REQUESTS the Secretary-General to bring this resolution and its Annex to the attention of the Member Governments and SOLAS Contracting Governments to the 1974 SOLAS Convention.

ANNEX

DESCRIPTION OF THE AMENDED MANDATORY SHIP REPORTING SYSTEM FOR THE STRAIT OF GIBRALTAR

1 Categories of ships required to participate in the system

Ships of the following general categories are required to participate in the reporting system:

.1 all ships of 300 gross tonnage and over;

.2 all ships, regardless of gross tonnage, carrying hazardous and or potentially polluting cargo, as defined in paragraph 1.4 of resolution MSC.43(64);

.3 ships engaged in towing or pushing another vessel regardless of gross tonnage;

.4 any category of vessel less than 300 gross tonnage which is using the appropriate traffic lane or separation zone in order to engage in fishing; and

.5 any category of ships less than 300 gross tonnage which is using the appropriate traffic separation zone in an emergency in order to avoid immediate danger.

Exemption

Recognizing that regular cross-Strait ferries, including passenger high-speed craft, generally operate according to published schedules, special reporting arrangements can be made on a ship-by-ship basis, subject to the approval of both TARIFA TRAFFIC and TANGIER TRAFFIC.

2 Geographical coverage of the system and the number and edition of the reference chart used for the delineation of the system

.1 The reporting system will cover the area (appendix) between longitudes 005° 58′.00 W and 005° 15′.00 W. This area includes the amended traffic separation scheme "In the Strait of Gibraltar" (IMO circular COLREG.2/Circ.58).

.2 The reference charts which include all the area of coverage for the system are Spanish Hydrographic Office 105, French marine hydrographic and oceanographic service (SHOM) No.7042 (INT 3150), and British Admiralty chart No.142.

3 Format, content of report, times and geographical positions for submitting reports, authority to whom reports should be sent, available services

The ship report short title "GIBREP" shall be made to the ship reporting centres located at TARIFA and TANGIER. Report should be made using VHF voice transmissions.

3.1 Format

The information requested from ships shall be provided in the standard reporting format, given in paragraph 2 of the appendix to IMO resolution A.851(20).

A ship may elect, for reasons of commercial confidentiality, to communicate that section of the GIBREP ENTRY report which provides information on cargo (line P) by non-verbal means prior to entering the system.

3.2 Content

The report from a ship to the VTS should contain only information which is essential to achieve the objectives of the system:

A – Name of the ship, call sign, IMO identification number;

B – Date and time of event;

C or D – Position in latitude and longitude or true bearing and distance from a clearly identified landmark;

E – True course;

F – Speed in knots;

G – Port of departure;

I – Port of destination and expected time of arrival;

P – Cargo and quantity and if dangerous goods are on board IMO classes and quantities;

Q or R – Defect, damage and/or deficiencies affecting the structure, cargo or equipment of the ship or any other circumstances affecting normal navigation, in accordance with the provisions of relevant IMO Conventions;

T – Address for provision of information concerning a cargo of dangerous goods;

W – Total number of persons on board;

X – Miscellaneous:

- estimated quantity of bunker fuel and characteristics for ships carrying over 5,000 tonnes bunker fuel;
- navigation conditions.

Note: On receipt of a position message, operators of the VTS will establish the relation between the ship's position and the information supplied by the facilities available to them. The information on heading and speed will facilitate the VTS operator's task of identifying a ship within a group.

3.3 Geographical position for submitting report

Westbound traffic should report to TARIFA TRAFFIC on the Spanish coast when crossing the meridian 005° 15′.00 W (appendix).

Eastbound traffic should report to TANGIER TRAFFIC on the Moroccan coast when crossing the meridian 005° 58′.00 W (appendix).

Reports to the nearer of the two shore stations should be made on departure from the limits of a port or anchorage within the coverage area, except vessels departing from Tangier-Med ports and its anchorage areas which should report to TANGIER TRAFFIC (appendix).

Further reports should be made to the relevant shore station whenever there is a change of navigational circumstances, particularly in relation to items Q and R of the reporting format detailed in section 3.2.

3.4 Authority

The shore-based authorities are:

.1 The Maritime Rescue Co-ordination Centre, MRCC TARIFA (Call sign: TARIFA TRAFFIC) under the authority of the Spanish Government Search and Rescue and Maritime safety Division. The Division, administered by the Ministry of Development, is entrusted, among other responsibilities, with providing services relating to maritime search and rescue, vessel traffic services and assistance, and prevention and control of pollution of the marine environment; and

.2 The Centre de Surveillance du Trafic Maritime de Tanger (CSTM Tanger, Call sign: TANGIER TRAFFIC) is under the authority of the Moroccan Merchant Marine Directorate. The Directorate, administered by the Ministry of Equipment and Transports, is entrusted, among other responsibilities, in cooperation with governmental bodies with providing services related to maritime search and rescue (SAR), vessel traffic services and assistance and prevention and control of pollution of the marine environment.

3.5 Services offered

Both TARIFA and TANGIER Centres monitor navigation in the TSS in the Strait of Gibraltar using radar and AIS.

Each of them provides regular information about weather and navigational condition, this information is broadcast at and on the following times and frequencies:

Station	**Frequency**	**Broadcasting hours (U.T.C)**
Tarifa (Call sign: TARIFA TRAFFIC)	VHF Ch 10	00h15; 04h15; 08h15; 12h15; 16h15; 20h15
Tangier (Call sign: TANGIER TRAFFIC)	VHF Ch 69	02h15; 06h15; 10h15; 14h15; 18h15; 22h15

Information broadcasts will be preceded by an announcement on VHF Ch 16 and broadcasts from both stations will end with a reminder about the time of the next broadcast and the VHF frequency on which it will be made.

When deemed necessary, navigational hazards, brought to the knowledge of any centre, could be broadcast at any time.

4 Information to be provided to participating ships and procedures to be followed

In addition to the general information stated above, TARIFA TRAFFIC and TANGIER TRAFFIC could provide a particular vessel with information regarding her position, course, speed and/or the identification of the traffic in her vicinity provided that it has been brought to the knowledge of the Centre. The ship should request this additional information.

5 Radiocommunication equipment required for the system, frequencies on which report should be transmitted and information to be reported

The radiocommunication equipment required for the system is that defined in the GMDSS for sea areas A1 and A2:

.1 The ship's reports can be made by voice on VHF radio using:

.1 Channel 10 for reporting to TARIFA TRAFFIC, with the channel 67 as a supplementary option; and

.2 Channel 69 for reporting to TANGIER TRAFFIC, with the channel 68 as a supplementary option.

.2 In special circumstances, the hectometric wave band may also be used for the interchange of information between the ship and the VTS;

.3 Information of commercial confidentiality may be transmitted by non-verbal means. Details are as follows:

TARIFA TRAFFIC
Fax: + 34 956 68 06 06
E-mail: tarifa@sasemar.es
Inmarsat telex: 422423126

TANGIER TRAFFIC
Fax: + 212 539 93 45 71
E-mail: tangiervts@dmm.gov.ma
Inmarsat telex: 424241310

.4 The language used for reports in the system will be English, using the IMO Standard Marine Communication Phrases (SMCPs) where necessary or Spanish, French or Arabic, if appropriate.

.5 Communications associated with reporting in accordance with the requirements of this system will be free of charge.

6 Rules and regulations in force in the area of the system

.1 The International Regulations for Preventing Collisions at Sea (COLREG) 1972, (as amended) are applicable throughout the area of coverage of the system; and

.2 The amended TSS "In the Strait of Gibraltar" has been approved by IMO and therefore rule 10 of the COLREGs applies.

7 Shore-based facilities to support operation of the system

7.1 Tarifa Traffic

Tarifa Traffic has radar, communication equipments in different bands and frequencies, VHF direction finding, AIS and DSC located in local and in remote sites to enable an appropriate coverage of the area.

Traffic surveillance is provided by a tracking system in which the AIS and VHF direction finding are integrated. Vessel tracks are continuously recorded and can be plotted on paper.

Besides, the Tarifa Traffic Centre is equipped with data processing and retrieval systems, and normal communications such as telephone, fax and e-mail terminals.

A continuous listening watch is kept on VHF Channel 16 and on the working channels.

7.2 Tangier Traffic

TANGIER VTS is an integrated system using facilities such as radars, communication equipments in different bands and frequencies, VHF direction finding, AIS and DSC located either in local site at Ras Parot and in remote site at Ras Cires in order to enable an appropriate coverage of the area.

TANGIER TRAFFIC system allows the simultaneous monitoring of 1,000 tracks, which can be recorded and saved. Advanced functions include alarms signalling risk scenarios, the identification of tracks infringing COLREG rules, particularly rule 10, and the monitoring of ships at anchor. All situations can be recorded, archived and replayed either on screen or in the form of printout.

A continuous listening watch is kept on VHF Channel 16 and on the working channels.

8 Alternative communication in case of failure of the shore-based communication facilities

.1 The system is designed to avoid, as far as possible, any irretrievable breakdown of equipment which would hinder the functioning of the services normally provided;

.2 The most important items of equipment and power sources are duplicated and the facilities are provided with emergency generating sets as well as with UPS units. A maintenance team, on call 24 hours a day, stands ready to repair, to the extent possible, any breakdowns which may occur; and

.3 If operations are jeopardized at either TARIFA TRAFFIC or TANGIER TRAFFIC, then the other centre will try to provide the service.

9 Measures to be taken if a ship fails to comply with the requirements of the system

The primary objective of the system is to facilitate the exchange of information between the ship and the shore and so support safe navigation and the protection of the marine environment. All means will be used to encourage and promote the full participation of ships required to submit reports under SOLAS regulation V/11. If reports are not submitted and the offending ship can be positively identified, then information will be passed to the relevant flag State Authorities for investigation and possible prosecution in accordance with national legislation. Information will also be made available to Port State Control Officers.

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ANNEX 2

RESOLUTION MSC.301(87)
(adopted on 17 May 2010)

ADOPTION OF AMENDMENTS TO THE EXISTING MANDATORY SHIP REPORTING SYSTEM IN "THE WESTERN EUROPEAN PARTICULARLY SENSITIVE SEA AREA" (WETREP)

THE MARITIME SAFETY COMMITTEE,

RECALLING article 28(b) of the Convention related to the creation of the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO regulation V/11 of the International Convention for the Safety of Life at Sea, 74 (SOLAS Convention), in relation to the adoption of ship reporting systems by the Organization,

RECALLING FURTHER resolution A.858(20), which authorizes the Committee to perform the function of adopting ship-reporting systems on behalf of the Organization,

TAKING INTO ACCOUNT the Guidelines and criteria for ship-reporting systems, adopted by resolution MSC.43(64), as amended by resolutions MSC.111(73) and MSC.189(79),

HAVING CONSIDERED the recommendations of the Sub-Committee on Safety of Navigation at its fifty-fifth session,

HAVING ALSO NOTED that the Marine Environment Protection Committee, at its fifty-second session, endorsed the recommendations of the Sub-Committee on Safety of Navigation at its fiftieth session and designated the Western European Waters as a Particularly Sensitive Sea Area (PSSA) by resolution MEPC.121(52),

1. ADOPTS, in accordance with SOLAS regulation V/11, the amendments to the existing ship-reporting system in "The Western European Particularly Sensitive Sea Area" (WETREP), as described in the Annex to this resolution;

2. DECIDES that the amendments to this mandatory ship-reporting system will enter into force at 0000 hours UTC on 1 December 2010;

3. REQUESTS the Secretary-General to bring this resolution and its Annex to the attention of Contracting Governments to the SOLAS Convention and to members of the Organization who are not parties to the Convention.

ANNEX

AMENDMENTS TO RESOLUTION MSC.190(79)

Annex 1 of resolution MSC.190(79):

In paragraph 6.2.5, under **Mandatory Ship Reporting Systems**, insert:

- "Off the coast of Portugal"

In paragraph 6.2.6, under **Coastal Vessel Traffic Services (VTS)**, insert:

- Coast of Portugal VTS

Annex 1 of resolution MSC.190(79), Appendix 1 – Vessel Traffic Services, RCC, coast radio stations or other facilities to whom the reports must be submitted

Under **PORTUGAL**, entire content to be replaced by the following:

PORTUGAL

ROCA CONTROL 38º 41′.508 N 009º 17′.915 W

Tel: +351 214464838
Fax: +351 214464839
E-mail: oper.vts@imarpor.pt
VHF: 22 & 79
MMSI: 002633030

___

4 ALBERT EMBANKMENT
LONDON SE1 7SR
Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

E

Ref. T2-OSS/2.7.1

COLREG.2/Circ.61
1 June 2010

NEW AND AMENDED EXISTING TRAFFIC SEPARATION SCHEMES

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010) adopted, in accordance with the provisions of resolution A.858(20), new and amended existing traffic separation schemes and associated routeing measures listed, in annexes 1 to 10, as follows:

.1 "Adlergrund" (new scheme);

.2 "Slupska Bank" (new scheme);

.3 "West Klintehamn" (new scheme);

.4 "Midsjöbankarna" and "South Hoburgs Bank" (new schemes);

.5 "In the area off south-western coast of the Crimea" (new scheme);

.6 "Off Cape Roca" (amended scheme);

.7 "Off Cape S. Vicente" (amended scheme);

.8 "Off Porkkala Lighthouse" (amended scheme);

.9 "Off Kalbådagrund Lighthouse" (amended scheme); and

.10 "Off Hankoniemi Peninsula" (amended scheme).

2 The new and amended traffic separation schemes listed in subparagraphs 1.1, 1.2 and 1.5 to 1.10 above and detailed in annexes 1, 2, 5, 6, 7, 8, 9 and 10, will be implemented at 0000 hours UTC on 1 December 2010; those listed in subparagraphs 1.3 and 1.4 and detailed in annexes 3 and 4 will be implemented at 0000 hours UTC on 1 January 2011.

***

NEW AND AMENDED TRAFFIC SEPARATION SCHEMES AND ASSOCIATED ROUTEING MEASURES

ANNEX 1

NEW TRAFFIC SEPARATION SCHEME "ADLERGRUND"

(Reference chart: German Chart No.40 (INT 1201) published by the German Federal Maritime and Hydrographic Agency (BSH) (7th Edition, 2006).)

***Note*:** This chart is based on World Geodetic System 1984 Datum (WGS 84).

Description of the traffic separation scheme

The traffic separation scheme consists of:

- two traffic lanes 2.0 miles wide;
- one intermediate traffic separation zone 0.5 miles wide.

(a) A separation zone, half a mile wide, centred upon the following geographical positions:

(1)	54° 38′.00 N	014° 15′.50 E
(2)	54° 36′.50 N	014° 24′.00 E
(3)	54° 37′.00 N	014° 30′.00 E

(b) A traffic lane for eastbound traffic between the separation zone and a line connecting the following geographical positions:

(4)	54° 36′.00 N	014° 14′.50 E
(5)	54° 34′.50 N	014° 24′.00 E
(6)	54° 35′.00 N	014° 30′.50 E

(c) A traffic lane for westbound traffic between the separation zone and a line connecting the following geographical positions:

(7)	54° 40′.00 N	014° 16′.50 E
(8)	54° 38′.50 N	014° 24′.30 E
(9)	54° 39′.00 N	014° 29′.50 E

***

ANNEX 2

NEW TRAFFIC SEPARATION SCHEME "SLUPSKA BANK"

(Reference chart: Polish Chart No.252 (INT 1219) published by the Hydrographic Office of the Polish Navy (BHMW) (Edition 12/2004).)

***Note*:** This chart is based on World Geodetic System 1984 Datum (WGS 84).

Description of the traffic separation scheme

The traffic separation scheme consists of:

- two traffic lanes 1.75 miles wide in two parts;
- one intermediate traffic separation zone 0.5 miles wide in two parts;
- one inshore traffic zone associated with the eastern part of TSS.

West part:

(a) A separation zone bounded by a line connecting the following geographical positions:

(1)	54° 47′.93 N	016° 29′.41 E
(2)	54° 47′.43 N	016° 29′.53 E
(3)	54° 48′.80 N	016° 45′.90 E
(4)	54° 49′.28 N	016° 45′.78 E

(b) A traffic lane for eastbound traffic between the separation zone and a line connecting the following geographical positions:

(5)	54° 45′.70 N	016° 29′.97 E
(6)	54° 47′.06 N	016° 46′.32 E

(c) A traffic lane for westbound traffic between the separation zone and a line connecting the following geographical positions:

(7)	54° 51′.01 N	016° 45′.35 E
(8)	54° 49′.66 N	016° 28′.97 E

East part:

(d) A separation zone bounded by a line connecting the following geographical positions:

(9)	54° 50′.74 N	016° 56′.58 E
(10)	54° 50′.26 N	016° 56′.79 E
(11)	54° 53′.72 N	017° 21′.59 E
(12)	54° 54′.21 N	017° 21′.39 E

(e) A traffic lane for eastbound traffic between the separation zone and a line connecting the following geographical positions:

(13)	54° 48′.56 N	016° 57′.51 E
(14)	54° 52′.02 N	017° 22′.29 E

(f) A traffic lane for westbound traffic between the separation zone and a line connecting the following geographical positions:

(15)	54° 55′.91 N	017° 20′.68 E
(16)	54° 52′.44 N	016° 55′.86 E

(g) Inshore traffic zone:

The area between the southern boundary of the eastern part of the traffic separation scheme and the Polish coast, which lies between a line drawn from position (13) above in a direction of 158° to the coast and a line drawn from position (14) above in a direction of 135° to the coast, is designated as an inshore traffic zone.

***

ANNEX 3

NEW TRAFFIC SEPARATION SCHEME "WEST KLINTEHAMN"

(Reference chart: Swedish chart number SE72 edition 19/3-2008 in WGS 84.)

Description of the traffic separation scheme

(a) A traffic separation zone is established upon the following geographical positions:

(1)	57° 28′.00 N	017° 45′.67 E	(2)	57° 27′.09 N	017° 44′.75 E
(3)	57° 26′.10 N	017° 43′.97 E	(4)	57° 26′.49 N	017° 42′.26 E
(5)	57° 27′.49 N	017° 43′.06 E	(6)	57° 28′.49 N	017° 44′.05 E

(b) A traffic lane for the northbound traffic is established between the traffic separation zone and a traffic separation line connecting the following geographical positions:

(7)	57° 26′.55 N	017° 50′.52 E	(8)	57° 25′.87 N	017° 49′.82 E
(9)	57° 24′.95 N	017° 49′.09 E			

(c) A traffic lane for the southbound traffic is established between the traffic separation zone and a line connecting the following geographical positions:

(10)	57° 29′.93 N	017° 39′.18 E	(11)	57° 28′.71 N	017° 37′.98 E
(12)	57° 27′.63 N	017° 37′.13 E			

(d) The limits of an inshore traffic zone along the Gotland Island coastline lies between the following positions:

(7)	57° 26′.55 N	017° 50′.52 E	(8)	57° 25′.87 N	017° 49′.82 E
(9)	57° 24′.95 N	017° 49′.09 E	(13)	57° 26′.46 N	018° 07′.15 E
(14)	57° 20′.07 N	018° 10′.49 E			

***

ANNEX 4

NEW TRAFFIC SEPARATION SCHEMES "MIDSJÖBANKARNA" AND "SOUTH HOBURGS BANK"

(Reference chart: Swedish chart number SE7 edition 5/6-2008 in WGS 84.)

Description of the traffic separation schemes

"Midsjöbankarna"

(g) A traffic separation zone is established upon the following geographical positions:

(19)	55° 56′.16 N	017° 32′.41 E	(20)	55° 57′.45 N	017° 41′.68 E
(21)	55° 56′.68 N	017° 42′.13 E	(22)	55° 55′.38 N	017° 32′.71 E

(h) A traffic lane for the southbound traffic is established between the traffic separation zone and a line connecting the following geographical positions:

(23)	55° 59′.07 N	017° 31′.27 E	(24)	56° 00′.30 N	017° 40′.04 E

(i) A traffic lane for the northbound traffic is established between the traffic separation zone and a line connecting the following geographical positions:

(25)	55° 52′.47 N	017 °33′.85 E	(26)	55° 53′.85 N	017° 43′.75 E

"South Hoburgs bank"

(j) A traffic separation zone is established upon the following geographical positions:

(27)	56° 17′.57 N	018° 39′.09 E	(28)	56° 20′.23 N	018° 46′.82 E
(29)	56° 24′.58 N	018° 51′.02 E	(30)	56° 24′.20 N	018° 52′.31 E
(31)	56° 19′.64 N	018° 47′.81 E	(32)	56° 16′.89 N	018° 39′.88 E

(k) A traffic lane for the southbound traffic is established between the traffic separation zone and a line connecting the following geographical positions:

(33)	56° 20′.23 N	018° 36′.02 E	(35)	56° 26′.04 N	018° 46′.14 E
(34)	56° 22′.64 N	018° 42′.82 E			

(l) A traffic lane for the northbound traffic is established between the traffic separation zone and a line connecting the following geographical positions:

(36)	56° 14′.21 N	018° 42′.96 E	(38)	56° 22′.74 N	018° 57′.19 E
(37)	56° 17′.23 N	018° 51′.80 E			

***

ANNEX 5

NEW TRAFFIC SEPARATION SCHEME "IN THE AREA OFF THE SOUTH-WESTERN COAST OF THE CRIMEA"

(Reference Chart: State Hydrographic Service of Ukraine No.3301 (published 03/2009)).

Note: This chart is based on World Geodetic System 1984 Datum (WGS 84)

Description of the traffic separation scheme

The traffic separation scheme consists of two parts:

Part one, Routeing System No.9 "Sevastopol Harbour Approach"; and

Part two, Routeing System No.3 "From Cape Khersones to Cape Aitodor".

***Note*:** All geographical positions are referred to WGS 84 datum.

Part one, Routeing System No.9 "Sevastopol Harbour Approach"

Scheme consists of five elements.

Element I (Western) for entering (leaving) the roundabout area which includes two traffic lanes and a traffic separation zone limited by lines connecting the following geographical positions:

(1)	44° 40′.44 N	033° 08′.91 E
(2)	44° 39′.79 N	033° 13′.31 E
(3)	44° 38′.59 N	033° 13′.31 E
(4)	44° 38′.84 N	033° 08′.91 E

The outer limit of the traffic lane for entering the roundabout area passes through the following geographical positions:

(5)	44° 38′.04 N,	033° 08′.91 E;
(6)	44° 37′.79 N	033° 13′.31 E

The established direction of the traffic flow – 094.5°.

The outer limit of the traffic lane for leaving the roundabout area passes through the following geographical positions:

(7)	44° 40′.44 N	033° 13′.31 E
(8)	44° 41′.09 N	033° 08′.91 E

The established direction of the traffic flow – 281°.

Element II (Northern) for entering (leaving) the roundabout area includes two traffic lanes and a traffic separation zone limited by lines connecting the following geographical positions:

(9)	44° 43′.34 N	033° 14′.71 E
(10)	44° 40′.29 N	033° 16′.71 E
(10A)	44° 40′.11 N	033° 15′.87 E
(11)	44° 40′.19 N	033° 15′.21 E
(12)	44° 40′.89 N	033° 14′.71 E

The outer limit of the traffic lane for entering the roundabout area passes through the following geographical positions:

(13)	44° 43′.34 N	033° 13′.31 E
(7)	44° 40′.44 N	033° 13′.31 E

The established direction of the traffic flow – 180°.

The outer limit of the traffic lane for leaving the roundabout area passes through the following geographical positions:

(14)	44° 40′.11 N	033° 17′.83 E
(15)	44° 43′.34 N	033° 15′.73 E

The established direction of the traffic flow – 335°.

Element III (Southern) for entering (leaving) the roundabout area includes two traffic lanes and a traffic separation zone limited by lines connecting the following geographical positions:

(16)	44° 37′.55 N	033° 15′.41 E
(17)	44° 37′.28 N	033° 16′.81 E
(18)	44° 30′.73 N	033° 13′.29 E
(19)	44° 31′.64 N	033° 12′.19 E

The outer limit of the traffic lane for entering the roundabout area passes through the following geographical positions:

(20)	44° 30′.09 N	033° 14′.06 E
(21)	44° 37′.59 N	033° 18′.13 E

The established direction of the traffic flow – 021°.

The outer limit of the traffic lane for leaving the roundabout area passes through the following geographical positions:

(6)	44° 37′.79 N	033° 13′.31 E
(22)	44° 32′.84 N	033° 10′.63 E

The established direction of the traffic flow – 201°.

Element IV (roundabout area) includes the circular separation zone of the routeing system with a radius of 5 cables which centre is situated in the geographical position 44° 38′.8 N 033° 16′.9 E and a circular traffic lane 1.0 mile wide.

The established direction of the traffic flow – counter-clockwise around the circular separation zone.

Element V (Eastern) includes four traffic lanes and two separation zones.

Separation zones are limited by lines connecting the following geographical positions:

A	(24)	44° 38′.26 N	033° 18′.88 E	B	(28)	44° 37′.97 N	033° 23′.91 E
	(25)	44° 38′.99 N	033° 18′.96 E		(29)	44° 38′.29 N	033° 23′.91 E
	(26)	44° 38′.69 N	033° 21′.41 E		(30)	44° 37′.99 N	033° 25′.91 E
	(27)	44° 38′.12 N	033° 21′.41 E		(31)	44° 37′.89 N	033° 25′.91 E

The outer limit of the traffic lane for entering Sevastopol's'ka Bay passes through the following geographical positions:

(32)	44° 37′.79 N	033° 18′.44 E
(32A)	44° 37′.63 N	033° 21′.41 E
(33A)	44° 37′.49 N	033° 23′.93 E
(33)	44° 37′.29 N	033° 27′.71 E

The established direction of the traffic flow – 094.5° (Inkermans'kyi leading line).

The outer limit of the traffic lane for leaving Sevastopol's'ka Bay passes through the following geographical positions:

(34)	44° 38′.47 N	033° 27′.71 E
(34A)	44° 38′.99 N	033° 23′.93 E
(35A)	44° 39′.34 N	033° 21′.41 E
(35)	44° 39′.72 N	033° 18′.52 E

The established direction of the traffic flow – 280.9° (Kostiantynivs'kyi leading line).

Crossing northbound and southbound traffic should follow appropriate lanes on either side of a line which passes through the following geographical positions:

(36)	44° 38′.52 N	033° 22′.91 E
(37)	44° 38′.04 N	033° 22′.91 E

Lanes on both sides of the line are limited by separation zones.

The established directions of the traffic flow: 000° (eastward of the separation line) and 180° (westward of the traffic separation line).

***Notes**:*

1 *In the centre of the circular separation zone of the Routeing System (44° 38′.8 N 033° 16′.9 E) a special light buoy is positioned, light-yellow, flashing, 5s 5M. (Y Fl 5s 5M).*

2 Going out on Kostiantynivs'kyi leading lights should be followed:

- *for all vessels: from geographical position 44° 37′.44 N 033° 29′.61 E (crossing Inkermans'kyi and Lukul's'kyi leading lines);*

- *for vessels with actual draught over 10 m: from geographical position 44° 37′.49 N 033° 28′.56 E.*

3 Separation of traffic at crossing for northbound and southbound traffic is established by vessels following to/from Kozacha, Komysheva and Kruhla Bays and also vessels using anchorage point No.386 and degaussing range near Khersones Cape may enter/leave the Scheme and cross Part V of the Scheme.

4 Between meridians 33° 26′.0 E and 033° 28′.4 E vessels following to/from Striletz'ka Bay and also vessels using anchorage points No.384 and No.386 and degaussing ranges northward from Kruhla Bay may enter/leave the System and cross Part V of the System.

Part two, Routeing System No.3 "From Cape Khersones to Cape Aitodor"
Scheme consists of two elements.

Element I (North-Western) includes a junction area, where the Traffic Separation Scheme and local routes merge, associated separation zones and two traffic lines, limited by lines connecting the following geographical positions:

Route junction and separation of traffic at crossing:

A	(38)	44° 30′.62 N	033° 11′.64 E
	(39)	44° 29′.73 N	033° 12′.75 E
	(40)	44° 28′.72 N	033° 12′.21 E
	(41)	44° 29′.61 N	033° 11′.08 E

with the associated route junction border line passing through the following geographical positions:

A	(47)	44° 28′.59 N	033° 10′.55 E
	(48)	44° 27′.74 N	033° 11′.63 E

Separation zone:

B	(42)	44° 29′.12 N	033° 13′.52 E
	(43)	44° 17′.99 N	033° 27′.21 E
	(44)	44° 17′.99 N	033° 25′.46 E
	(45)	44° 28′.09 N	033° 12′.99 E

North-eastern border of the north-westbound traffic lane is limited by the separation zone and by the line, passing through the following geographical positions:

(46)	44° 17′.99 N	033° 29′.11 E
(20)	44° 30′.09 N	033° 14′.06 E

The established direction of the traffic flow – 318°.

South-Western borders of zone for separation of traffic at a crossing are limited by the separation zone and by the line passing through the following geographical positions:

B	(49)	44° 27′.09 N	033° 12′.46 E
	(50)	44° 17′.99 N	033° 23′.71 E

The established direction of the traffic flow – 138°.

Element II (Eastern) includes a junction area, where the Traffic Separation Scheme and local routes merge, associated separation zones, four traffic lanes and a line limited by lines connecting the following geographical positions:

Route junction and separation of traffic at crossing:

A	(53)	44° 16′.99 N	033° 26′.71 E
	(54)	44° 16′.99 N	033° 28′.51 E
	(55)	44° 15′.99 N	033° 29′.81 E
	(56)	44° 15′.99 N	033° 28′.01 E

with the associated route junction border lines passing through the following geographical positions:

South-western

(51)	44° 16′.99 N	033° 24′.91 E
(52)	44° 15′.99 N	033° 26′.21 E

Southern

(68)	44° 14′.99 N	033° 29′.31 E
(69)	44° 14′.99 N	033° 31′.11 E

Two separation zones:

B	(57)	44° 16′.99 N	033° 30′.31 E	C	(61)	44° 16′.99 N	034° 06′.81 E
	(58)	44° 16′.99 N	034° 03′.61 E		(62)	44° 16′.99 N	034° 14′.91 E
	(59)	44° 15′.99 N	034° 03′.11 E		(63)	44° 15′.99 N	034° 14′.91 E
	(60)	44° 15′.99 N	033° 31′.61 E		(64)	44° 15′.99 N	034° 06′.31 E

Traffic lanes

Northern border of the westbound traffic lane is limited by the separation zones and by the lines passing through the following geographical positions:

A	(65)	44° 17′.99 N	034° 14′.91 E	B	(67)	44° 17′.99 N	034° 04′.11 E
	(66)	44° 17′.99 N	034° 07′.31 E		(46)	44° 17′.99 N	033° 29′.11 E

The established direction of the traffic flow – 270°.

Southern borders of the eastbound traffic lane are limited by the separation zones and by the lines passing through the following geographical positions:

C	(70)	44° 14′.99 N	033° 32′.91 E	D	(72)	44° 14′.99 N	034° 05′.81 E
	(71)	44° 14′.99 N	034° 02′.61 E		(73)	44° 14′.99 N	034° 14′.91 E

The established direction of the traffic flow – 090°.

Crossing north-eastbound and south-westbound traffic should follow appropriate lanes on either side of a line, which passes through the following geographical positions:

(74)	44° 16′.99 N	034° 05′.21 E
(75)	44° 15′.99 N	034° 04′.71 E

Lanes from both sides of the line are limited by the separation zones.

The established directions of the traffic flow: 020° (eastward from the separation line) and 200° (westward from the separation line).

***Notes**:*

1 *Traffic lanes along the traffic separation line are used by vessels following from south to the port of Yalta and in the opposite direction.*

2 *While proceeding from TSS No.3 to the port of Yalta and in the opposite direction it is necessary to follow the recommended track No.8.*

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ANNEX 6

AMENDED TRAFFIC SEPARATION SCHEME "OFF CAPE ROCA"

(Reference chart: Portuguese Hydrographic Office 21101 (INT 1081), 4th impression, April 2002)
Note: All positions are given in World Geodetic System 1984 Datum (WGS 84)

Description of the amended traffic separation scheme

(a) A separation zone bounded by lines connecting the following geographical positions:

(1)	38º 39′.17 N 009º 43′.12 W	(3)	38º 51′.91 N 009º 49′.48 W
		(4)	38º 43′.20 N 009º 49′.48 W
(2)	38º 51′.91 N 009º 44′.43 W	(5)	38º 38′.27 N 009º 48′.02 W

(b) A northbound traffic lane between the separation zone described in (a) and a separation zone by lines connecting the following geographical positions, for ships not carrying dangerous or pollutant cargoes in bulk:

(6)	38º 37′.56 N 009º 51′.86 W	(9)	38º 51′.91 N 009º 54′.88 W
(7)	38º 42′.85 N 009º 53′.43 W	(10)	38º 42′.71 N 009º 54′.88 W
(8)	38º 51′.91 N 009º 53′.43 W	(11)	38º 37′.30 N 009º 53′.28 W

(c) A northbound traffic lane between the separation zone described in (b) and a central separation zone bounded by lines connecting the following geographical positions, for ships carrying dangerous or pollutant cargoes in bulk (*see note*):

(12)	38º 36′.55 N 009º 57′.37 W	(15)	38º 51′.91 N 010º 04′.33 W
(13)	38º 42′.31 N 009º 59′.08 W	(16)	38º 41′.83 N 010º 04′.33 W
(14)	38º 51′.91 N 009º 59′.08 W	(17)	38º 35′.61 N 010º 02′.49 W

(d) A southbound traffic lane between the separation zone described in (c) and a separation zone bounded by lines connecting the following geographical positions, for ships not carrying dangerous or pollutant cargoes in bulk:

(18)	38º 34′.88 N 010º 06′.43 W	(21)	38º 51′.91 N 010º 09′.83 W
(19)	38º 41′.45 N 010º 08′.38 W	(22)	38º 41′.32 N 010º 09′.83 W
(20)	38º 51′.91 N 010º 08′.38 W	(23)	38º 34′.62 N 010º 07′.84 W

(e) A southbound traffic lane between the separation zone described in (d) and a line connecting the following geographical positions, for ships carrying dangerous or pollutant cargoes in bulk (*see note*):

(24)	38º 33′.92 N 010º 11′.69 W	(26)	38º 51′.91 N 010º 13′.78 W
(25)	38º 40′.96 N 010º 13′.77 W		

(f) A two-way traffic route 2 miles wide established between the separation zone described in (a) and a separation zone bounded by the lines connecting the following geographical positions, for ships sailing between ports situated between Cape Finisterre and Punta del Perro and southbound ships bound to the port of Lisbon or northbound ships leaving the port of Lisbon, except for ships carrying oils listed in Appendix I of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78) and ships carrying in bulk the substances listed in categories A and B in appendices I and II of Annex II of that same Convention:

(27)	38º 39′.63 N	009º 40′.63 W	(29)	38º 51′.91 N	009º 41′.23 W
(28)	38º 51′.91 N	009º 41′.87 W	(30)	38º 39′.74 N	009º 39′.99 W

(g) The area between the separation zone described in paragraph (f) and the Portuguese coast, bounded on the north by the parallel of 38º 51′.91 N and on the south by the line connecting point with position 38º 39′.74 N, 009º 39′.99 W and Cape Raso lighthouse (38º 42′.56 N, 009º 29′.14 W), is designated as an inshore traffic zone.

Note: Dangerous cargoes in bulk refers to the IMDG Code and Annexes I and II of MARPOL.

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ANNEX 7

AMENDED TRAFFIC SEPARATION SCHEME "OFF CAPE S. VICENTE"

(Reference chart: Portuguese Hydrographic Office 21101 (INT 1081), 4th impression, April 2002)
***Note*:** All positions are given in World Geodetic System 1984 Datum (WGS 84)

Description of the amended traffic separation scheme

(a) A separation zone bounded by lines connecting the following geographical positions:

(1)	36º 47′.73 N 008º 58′.09 W	(5)	37º 01′.06 N 009º 19′.56 W
(2)	36º 49′.36 N 009º 05′.96 W	(6)	36º 53′.79 N 009º 17′.46 W
(3)	36º 55′.58 N 009º 13′.12 W	(7)	36º 45′.98 N 009º 08′.40 W
(4)	37º 01′.94 N 009º 14′.78 W	(8)	36º 43′.96 N 008º 59′.40 W

(b) A northbound traffic lane between the separation zone described in (a) and a separation zone by lines connecting the following geographical positions, for ships not carrying dangerous or pollutant cargoes in bulk:

(9)	36º 40′.89 N 009º 00′.47 W	(13)	37º 00′.08 N 009º 24′.82 W
(10)	36º 43′.16 N 009º 10′.53 W	(14)	36º 51′.68 N 009º 22′.40 W
(11)	36º 52′.25 N 009º 21′.07 W	(15)	36º 42′.13 N 009º 11′.32 W
(12)	37º 00′.34 N 009º 23′.41 W	(16)	36º 39′.77 N 009º 00′.86 W

(c) A northbound traffic lane between the separation zone described in (b) and a central separation zone bounded by lines connecting the following geographical positions, for ships carrying dangerous or pollutant cargoes in bulk (*see note*):

(17)	36º 36′.49 N 009º 02′.00 W	(21)	36º 58′.35 N 009º 34′.07 W
(18)	36º 39′.11 N 009º 13′.60 W	(22)	36º 47′.98 N 009º 31′.07 W
(19)	36º 50′.04 N 009º 26′.26 W	(23)	36º 35′.34 N 009º 16′.44 W
(20)	36º 59′.31 N 009º 28′.94 W	(24)	36º 32′.40 N 009º 03′.41 W

(d) A southbound traffic lane between the separation zone described in (c) and a separation zone bounded by lines connecting the following geographical positions, for ships not carrying dangerous or pollutant cargoes in bulk:

(25)	36º 29′.28 N 009º 04′.49 W	(29)	36º 57′.36 N 009º 39′.40 W
(26)	36º 32′.47 N 009º 18′.61 W	(30)	36º 45′.83 N 009º 36′.07 W
(27)	36º 46′.40 N 009º 34′.74 W	(31)	36º 31′.42 N 009º 19′.40 W
(28)	36º 57′.62 N 009º 37′.98 W	(32)	36º 28′.14 N 009º 04′.88 W

(e) A southbound traffic lane between the separation zone described in (d) and a line connecting the following geographical positions, for ships carrying dangerous or pollutant cargoes in bulk (*see note*):

(33)	36º 25′.07 N 009º 05′.95 W	(35)	36º 44′.29 N 009º 39′.67 W
(34)	36º 28′.60 N 009º 21′.53 W	(36)	36º 56′.64 N 009º 43′.24 W

(f) A one-way traffic route 2 miles wide established between the separation zone described in (a) and a separation zone bounded by the lines connecting the following geographical positions, for southbound ships sailing between ports situated between Cape Finisterre and Punta del Perro and southbound ships bound to the port of Portimão, except for ships carrying oils listed in appendix I of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the protocol of 1978 (MARPOL 73/78) and ships carrying in bulk the substances listed in categories A and B in appendices I and II of Annex II of that same Convention:

(37)	36º 49′.65 N 008º 57′.43 W	(41)	37º 02′.50 N 009º 11′.72 W
(38)	36º 51′.05 N 009º 04′.68 W	(42)	36º 56′.74 N 009º 10′.36 W
(39)	36º 56′.51 N 009º 10′.91 W	(43)	36º 51′.51 N 009º 04′.34 W
(40)	37º 02′.39 N 009º 12′.34 W	(44)	36º 50′.14 N 008º 57′.25 W

(g) The area between the separation zone described in paragraph (f) and the Portuguese coast, bounded on the north by the line connecting point with position 37º 02′.50 N 009º 11′.72 W and Cape S. Vicente lighthouse (37º 01′.37 N 008º 59′.79 W) and on the east by the line connecting point with position 36º 50′.14 N 008º 57′.25 W and Ponta de Sagres lighthouse (36º 59′.67 N 008º 56′.95 W), is designated as an inshore traffic zone.

Note: Dangerous cargoes in bulk refers to the IMDG Code and Annexes I and II of MARPOL.

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ANNEX 8

AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEME "OFF PORKKALA LIGHTHOUSE"

(Reference Chart: Estonian charts number 300 (Edition 2006-15-12) and 302 (Edition 2004-24-11); Finnish charts number 952 (Edition 2008-11-10) and 953 (2008-06-10), and Russian chart number 23068 (Edition 2001))

Note**:** Finnish and Estonian charts are based on World Geodetic System 1984 Datum (WGS 84); Russian chart is based on Geodetic datum of the year 1942 (Pulkovo). For obtaining position in WGS datum such position should be moved 0.13′ westward.

Description of the amended traffic separation scheme

Note**:** All positions are referred to WGS 84 datum

(a) A separation zone, 0.7 nautical miles wide, is bounded by lines connecting the following geographical positions:

(1)	59° 43´.51 N	024° 18´.16 E
(2)	59° 44´.08 N	024° 21´.96 E
(3)	59° 44´.94 N	024° 29´.64 E
(4)	59° 45´.47 N	024° 27´.97 E
(5)	59° 44´.76 N	024° 21´.61 E
(6)	59° 44´.19 N	024° 17´.77 E

(b) A separation zone is bounded by lines connecting the following geographical positions:

(7)	59° 47´.33 N	024° 35´.39 E
(8)	59° 45´.74 N	024° 21´.11 E
(9)	59° 45´.54 N	024° 21´.21 E
(10)	59° 46´.48 N	024° 29´.65 E
(11)	59° 45´.34 N	024° 33´.21 E
(12)	59° 45´.67 N	024° 36´.13 E

(c) A separation zone, 1.7 nautical miles wide, is bounded by lines connecting the following geographical positions:

(20)	59° 49´.14 N	025° 07´.23 E
(21)	59° 49´.58 N	025° 11´.12 E
(22)	59° 51´.24 N	025° 10´.39 E
(23)	59° 50´.80 N	025° 06´.50 E

(d) A traffic lane for eastbound traffic, 2.0 nautical miles wide, is bounded a line connecting the following geographical positions:

(1)	59° 43´.51 N	024° 18´.16 E
(2)	59° 44´.08 N	024° 21´.96 E
(3)	59° 44´.94 N	024° 29´.64 E
(15)	59° 42´.98 N	024° 30´.50 E
(14)	59 °42´.13 N	024° 22´.96 E
(13)	59° 41´.58 N	024° 19´.29 E

(e) A traffic lane for westbound traffic, 1.0 nautical mile wide, is bounded by a line connecting the following geographical positions:

(3)	59° 44´.94 N	024° 29´.64 E
(4)	59° 45´.47 N	024° 27´.97 E
(5)	59° 44´.76 N	024° 21´.61 E
(6)	59° 44´.19 N	024° 17´.77 E
(9)	59° 45´.54 N	024° 21´.21 E
(10)	59° 46´.48 N	024° 29´.65 E
(11)	59° 45´.34 N	024° 33´.21 E

(f) A traffic lane for westbound traffic, 2.0 nautical miles wide, is bounded by lines connecting the following geographical positions:

(7)	59° 47´.33 N	024° 35´.39 E
(8)	59° 45´.74 N	024° 21´.11 E
(19)	59° 47´.08 N	024° 16´.07 E
(18)	59° 47´.68 N	024° 20´.11 E
(17)	59° 49´.29 N	024° 34´.53 E

(g) A traffic lane for eastbound traffic, 2.0 nautical miles wide, is bounded by lines connecting the following geographical positions:

(20)	59° 49´.14 N	025° 07´.23 E
(21)	59° 49´.58 N	025° 11´.12 E
(25)	59° 47´.62 N	025° 11´.99 E
(24)	59° 47´.18 N	025° 08´.10 E

(h) A traffic lane for westbound traffic, 2.0 nautical miles wide, is bounded by lines connecting the following geographical positions:

(22)	59° 51´.24 N	025° 10´.39 E
(23)	59° 50´.80 N	025° 06´.50 E
(27)	59° 52´.76 N	025° 05´.64 E
(26)	59° 53´.19 N	025° 09´.53 E

(i) An amended precautionary area with recommended direction of traffic flow is established connecting the following geographical positions:

(15)	59° 42´.98 N	024° 30´.50 E
(16)	59° 43´.70 N	024° 36´.99 E
(24)	59° 47´.18 N	025° 08´.10 E
(20)	59° 49´.14 N	025° 07´.23 E
(23)	59° 50´.80 N	025° 06´.50 E
(27)	59° 52´.76 N	025° 05´.64 E
(17)	59° 49´.29 N	024° 34´.53 E
(7)	59° 47´.33 N	024° 35´.39 E
(12)	59° 45´.67 N	024° 36´.13 E
(11)	59° 45´.34 N	024° 33´.21 E
(3)	59° 44´.94 N	024° 29´.64 E

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ANNEX 9

AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEME "OFF KALBÅDAGRUND LIGHTHOUSE"

(Reference Chart: Estonian charts number 300 (Edition 2006-15-12) and 302 (Edition 2004-24-11); Finnish charts number 952 (Edition 2008-11-10) and 953 (2008-06-10), and Russian chart number 23069 (Edition 2005))

Note: Finnish and Estonian charts are based on World Geodetic System 1984 Datum (WGS 84); Russian chart is based on Geodetic datum of the year 1942 (Pulkovo). For obtaining position in WGS datum such position should be moved 0.13′ westward.

Description of the amended traffic separation scheme

Note: All positions are referred to WGS 84 datum

(a) A separation zone is bounded by lines connecting the following geographical positions:

(28)	59° 52´.35 N	025° 40´.06 E
(29)	59° 52´.84 N	025° 46´.03 E
(30)	59° 53´.81 N	025° 51´.77 E
(31)	59° 54´.75 N	025° 51´.14 E
(32)	59° 53´.81 N	025° 45´.55 E
(33)	59° 53´.34 N	025° 39´.73 E

(b) A traffic lane for eastbound traffic, 2.0 nautical miles wide, is established between the separation zone described in paragraph (a) above and a line connecting the following geographical positions:

(34)	59° 50´.37 N	025° 40´.70 E
(35)	59° 50´.89 N	025° 46´.99 E
(36)	59° 51´.91 N	025° 53´.04 E

(c) A traffic lane for westbound traffic, 2.0 nautical miles wide, is established between the separation zone described in paragraph (a) above and a line connecting the following geographical positions:

(37)	59° 56´.65 N	025° 49´.88 E
(38)	59° 55´.76 N	025° 44´.59 E
(39)	59° 55´.31 N	025° 39´.09 E

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ANNEX 10

AMENDED TRAFFIC SEPARATION SCHEME "OFF HANKONIEMI PENINSULA"

(Reference Chart: Estonian chart number 302 (Edition 2004-24-11); Finnish charts number 952 (Edition 2008-11-10) and 953 (2008-06-10), and Russian chart number 23067 (Edition 2001).)

***Note*:** Finnish and Estonian charts are based on World Geodetic System 1984 Datum (WGS 84); Russian chart is based on Geodetic datum of the year 1942 (Pulkovo). For obtaining position in WGS datum such position should be moved 0.13′ westward.

Description of the amended traffic separation scheme

***Note*:** All positions are referred to WGS 84 datum.

(a) A new precautionary area adjacent to the traffic separation scheme is established connecting the following geographical positions:

(40)	59° 40´.99 N	023° 32´.98 E
(41)	59° 34´.24 N	023° 37´.70 E
(42)	59° 25´.31 N	022° 48´.07 E
(43)	59° 34´.71 N	022° 41´.52 E
(44)	59° 39´.31 N	023° 21´.16 E

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SN.1/Circ.288
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GUIDELINES FOR BRIDGE EQUIPMENT AND SYSTEMS, THEIR ARRANGEMENT AND INTEGRATION (BES)

1 The Sub-Committee on Safety of Navigation (NAV), at its fifty-fifth session (27 to 31 July 2009), agreed on Guidelines for bridge equipment and systems, their arrangement and integration (BES).

2 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), in considering that these guidelines should replace the existing performance standards for IBS (resolution MSC.64(67), Annex 1), approved the circulation of the annexed Guidelines for bridge equipment and systems, their arrangement and integration (BES).

3 This circular supersedes resolution MSC.64(67), Annex 1 on the Recommendation on performance standards for integrated bridge systems (IBS).

4 Member Governments are invited to bring the information to the attention of all parties concerned.

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ANNEX

GUIDELINES FOR BRIDGE EQUIPMENT AND SYSTEMS, THEIR ARRANGEMENT AND INTEGRATION (BES)

Index

GUIDELINES FOR BRIDGE EQUIPMENT AND SYSTEMS, THEIR ARRANGEMENT AND INTEGRATION (BES)

1 Purpose

1.1 These guidelines aim to support the design and configuration of bridge equipment and systems, their arrangement and integration for safe and effective operation of the vessel under the control of the bridge team and pilot.

1.2 These guidelines aim to allow for a task oriented presentation and integration of information on ship bridges.

1.3 These guidelines aim to assist with the management of the workload of the bridge team; enhance the safe operation of the ship; and implementing measures intended to reduce human errors.

1.4 These guidelines aim to be a guiding umbrella instrument for bridge equipment and systems, their arrangement and integration.

1.5 These guidelines support the application of SOLAS regulation V/15.

2 Scope

2.1 These guidelines provide:

2.1.1 General design principles for bridge design and arrangement

2.1.2 A methodology for the integration and arrangement of equipment and systems into an integrated bridge.

2.1.3 Definition of major bridge tasks and configuration of workstations

2.2 The design recommendations aim to ensure that the bridge is simple to be operated by a trained user. Guidance for the provision of onboard familiarization material is provided, as it is a requirement of the ISM Code that personnel working on assignments related to safety and the protection of the environment need to be given proper familiarization with their duties.

2.3 These guidelines are recommended for manufacturers, installers, yards, suppliers and ship surveyors with regard to bridge equipment and systems, their arrangement and integration.

2.4 These guidelines intend to support the design of ship bridges for ships mandated by the SOLAS Convention.

3 References

Resolution MSC.191(79)	Performance standards for the presentation of navigation-related information on shipborne navigational displays
Resolution MSC.252(83)	Revised performance standards for Integrated Navigation Systems (INS)
MSC/Circ.982	Guidelines on ergonomic criteria for bridge equipment and layout

SN/Circ.243	Guidelines for the presentation of navigation-related symbols, terms and abbreviations
SN.1/Circ.265	Guidelines on the application of SOLAS regulation V/15 to INS, IBS and bridge design
SN.1/Circ.274	Guidelines for application of the modular concept to performance standards
SOLAS regulation IX/3	Safety management requirements
SOLAS 1974, as amended	The International Convention for Safety of Life at Sea, 1974, as amended
Resolution A.997(25)	Survey guidelines under the Harmonized System of Survey and Certification, 2007 (HSSC)

4 Definitions

For the purpose of these guidelines, the definitions in Appendix 1 apply.

Module A – Configuration of workstations

5 General

5.1 To support a modular and task oriented bridge design the assignment of the main tasks to the workstations are described generically in paragraph 6.

5.2 If an INS is provided the INS may cover parts of the recommended tasks.

5.3 Other workstations specific to the ship type or design are to comply with these functional requirements of these guidelines, as applicable.

5.4 The description of workstations are given in the guidelines on ergonomic criteria for bridge equipment and layout[1].

5.5 The recommended equipment for the workstations is listed in the guidelines on ergonomic criteria for bridge equipment and layout[1].

6 Allocation and grouping of tasks of dedicated workstations

6.1 Workstation for navigating and manoeuvring:

6.1.1 Tasks to be supported by the workstation for navigating and manoeuvring:

- Collision avoidance (traffic surveillance)
- Route monitoring (grounding avoidance):
  - Ship's position
  - Water depth
  - Chart information

[1] MSC/Circ.982.

- Monitoring of:
  - Heading
  - Ship's speed
  - Ship's rate of turn
  - Rudder angle/thrust direction
  - Main propulsion, RPM, pitch/thrust
  - Wind speed and direction
  - Time
- Internal and external communication as necessary for the defined task
- Monitoring and handling of alerts that are presented on the bridge
- Manoeuvring including:
  - Automatic steering control and operation, including non-follow up (NFU) override control
  - Manual steering control and operation
  - Steering mode selection
  - Thrusters control and operation
  - Propulsion control and operation
- Operation of navigation lights, sound and light signals
- Audible surveillance – reception of sound signals
- Operation of window wipers, washing, heating
- Operation of searchlights
- Acknowledgment of Bridge Navigational Watch Alarm Systems (BNWAS)

6.1.2 The following navigational tasks specified in the INS performance standards should be supported at the workstation for navigating and manoeuvring, if provided:

- collision avoidance (traffic surveillance)
- route monitoring (grounding avoidance)
- alert management
- navigation control data
- status and data display

6.1.3 Operation and monitoring of Centralized Alert Management HMI (CAM-HMI)*, if provided.

* As specified within the bridge alert management performance standards.

6.2 Workstation for monitoring:

6.2.1 Tasks to be supported by the workstation for monitoring:

- Collision avoidance (traffic surveillance)
- Route monitoring (grounding avoidance):
    - Ship's position
    - Water depth
    - Chart information
- Monitoring of:
    - Heading
    - Ship's speed
    - Ship's rate of turn
    - Rudder angle/thrust direction
    - Main propulsion, RPM, pitch/thrust
    - Wind speed and direction
    - Time
- Internal and external communication as necessary for the defined task
- Monitoring and handling of alerts that are presented on the bridge
- Operation of sound signals
- Operation of window wipers, washing, heating
- Acknowledgment of BNWAS

6.2.2 The following navigational tasks specified in the INS performance standards should be supported at the workstation for monitoring, if provided:

- collision avoidance
- route monitoring
- alert management
- navigation control data
- status and data display

6.2.3 Operation and monitoring of CAM-HMI*, if provided.

* As specified within the bridge alert management performance standards.

6.3 Workstation for manual steering (Helmsman's workstation):

6.3.1 Tasks to be supported by the workstation for manual steering:

- Manual steering with compass heading and visual marks:
  - Control and operation of steering device for manual steering
  - monitoring of: gyro and magnetic compass heading, pre-set heading, rudder angle, rate of turn
- Communication with bridge wings

6.4 Workstation for docking (bridge wing):

6.4.1 Tasks to be supported by the workstation for docking:

- Operation for docking, pilot and safety manoeuvres including:
  - Steering control and operation
  - Propulsion control and operation
  - Thrusters control and operation
- Monitoring of:
  - Heading
  - Ship's speed including longitudinal and transversal components
  - Ship's rate of turn
  - Rudder angle/thrust direction
  - Main propulsion, RPM, pitch/thrust
  - Wind speed and direction
- Internal communication with wheelhouse (workstations for navigating and manoeuvring, monitoring, manual steering) and manoeuvring stations
- External communication as necessary for the defined task, e.g., with tugs/pilot boats
- Operation of Morse lamp and searchlight
- Acknowledgment of BNWAS

6.5 Workstation for planning and documentation:

6.5.1 Tasks to be supported by the workstation for planning and documentation:

- Voyage planning

- Documentation, recording, administration including:
  - Navigational administration, e.g., update of charts and nautical publications
  - Electronic protocol and documentation of voyage with HMI, e.g., ship's log-book
  - Ship's reporting (regulation 28 of SOLAS chapter V, 2002, as amended)

6.5.2 The following navigational tasks specified in the INS performance standards should be supported at the workstation for planning and documentation (if provided):

- route planning

6.6 Workstation for safety:

6.6.1 Tasks to be supported by the workstation for safety:

- Safety operations:
  - Fire detection
  - Operation of safety related power operated doors/openings
  - Monitoring of status indications for shell doors/openings
  - Emergency stop for ventilation system and dampers, air conditioning
  - Operation of fire extinguishing systems
  - Operation general alarm/public address system
- Stability operations:
  - Ballast water management
  - Bilge control system
  - Anti-heeling
  - Stabilizer
  - Flooding valves
- Security operations including:
  - Observation with close circuit TV
  - Control of deck lights
- Internal and external communication as necessary for the defined task

6.7 Workstation for communication:

6.7.1 Tasks to be supported by the workstation for communication:

- Internal communication
- External communication:
    - Distress and safety communications

7 Requirements for allocation of tasks and functions

7.1 Allocation of tasks to workstations

7.1.1 The allocation of the functionality for the bridge tasks to the workstations should support the assigned tasks for the workstation, and should be sufficiently simple to support team working and awareness of operator roles. If task stations are provided, the selection of the dedicated functionality should be possible by a simple operator action.

7.1.2 Additional functionality provided at the specified workstations should not interfere with the functionality listed in paragraph 6 of these guidelines.

7.2 Integration of functionality, operational controls and information

7.2.1 Interrelated functionality, operational controls and information should be grouped task oriented on the workstations.

7.2.2 Interrelated functions, operational controls and information of one task should be arranged in functional groups.

Module B – Arrangement and design – human machine interface

8 Bridge design

8.1 Every ship should at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

Therefore the requirements of MSC/Circ.982 should apply.

8.2 The field of vision should not impair the performance to maintain a proper lookout by sight of the OOW at least at the following workstations: workstation for navigating and manoeuvring, workstation for monitoring, workstation for manual steering (helmsman's workstation).

8.3 The field of vision from these workstations should be such as to enable observation of all objects which may affect the safe conning of the ship.

8.4 The field of vision from all workstations should be in accordance with regulation 22 of SOLAS chapter V, 2002, as amended, and MSC/Circ.982.

8.5 It should be possible to maintain lookout and general surveillance of the ship at the workstation for navigating and manoeuvring.

8.6 External sound signals from ships and fog signals that are audible on the open deck should also be audible inside the wheelhouse; a sound reception system should be provided to reproduce such signals inside the wheelhouse, if it is enclosed.

9 Layout and physical arrangement of workstations

9.1 For the layout and physical arrangement of workstations on the bridge the requirements of MSC/Circ.982 and relevant guidance on application of SOLAS regulation V/15, adopted by the Organization, should be taken into account.

9.2 Sufficient and solidly built hand grab rails should be provided on all consoles at any workstation and as far as practicable within grab distance.

10 Design of bridge equipment

10.1 System design

10.1.1 For the design and layout of human machine interfaces (HMI), MSC/Circ.982 and relevant guidance on application of SOLAS regulation V/15 adopted by the Organization[1] should be taken into account.

10.1.2 The design and implementation of the systems and equipment should ensure that it is simple to operate by a trained user.

10.1.3 The design of the systems and equipment should facilitate the tasks to be performed by the bridge team and pilot in navigating the ship safely under all operational conditions.

10.1.4 The configuration of the systems and equipment and presentation of information at workstations should permit observation or monitoring by the bridge team and pilot under all operating conditions.

10.1.5 The operation of the systems and equipment should be designed to avoid distraction from the task of safe navigation.

10.1.6 Integrated graphical and alphanumeric display and control functions should adopt a consistent human machine interface (HMI) philosophy and implementation.

10.1.7 A central dimming functionality should be provided to adjust the illumination of task stations, displays, controls and panel labels with one control function for the bridge and/or equipment integrated in a console. Exclusions are permitted for equipment which do not provide a digital interface. Individual dimming of the task stations, displays, functional groups of controls and panel labels should also be possible. Guidance on dimming is also provided in MSC/Circ.982.

10.2 Operation of equipment – data input

10.2.1 The operation of equipment should conform to the general principles of MSC/Circ.982.

10.2.2 The bridge should be so designed that the requested manual inputs are consistent throughout the systems and equipment as far as practicable and can be easily executed.

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1 SN.1/Circ.265.

10.2.3 The systems and equipment should be designed that the basic functions can be easily operated.

10.2.4 Complex or error-prone interaction with the systems and equipment should be avoided.

10.2.5 Checks in the dialogue and in the input handling should be provided to prevent erroneous data or control inputs (e.g., plausibility checks).

10.2.6 For manual inputs that may cause unintended results, the systems and equipment should request confirmation before acceptance.

10.3 Presentation of information

10.3.1 The information on the bridge should be presented according to the general principles of resolution MSC.191(79) and MSC/Circ.982.

10.3.2 Mode and status awareness

10.3.2.1 The operational mode in use should be clearly indicated to the bridge team and pilot.

10.3.2.2 If the mode in use is not the normal mode to fully perform the functions, this should be clearly indicated.

Example of modes other than the normal mode are:

- degraded condition modes, in which the systems cannot fully perform all functions
- "service modes"
- simulation mode
- training (familiarization) mode

10.3.2.3 If the system is in a degraded condition this should be sufficiently clear that the bridge team and pilot can understand the nature of the failure and its consequences.

10.3.2.4 The systems should indicate the operational status of automated functions and integrated components, systems and/or subsystems.

Module C – Fault tolerance

11 Backup and redundancies

11.1 Adequate backup arrangements should be provided to ensure safe operation in case of a failure.

11.2 In case of failure of one part or function, including network failure, it should be possible to operate each other individual part or function separately, except for those functions directly dependent on the defective part; at least the requirements specified for individual equipment adopted by the Organization should be met, as far as applicable.

11.3 The backup arrangement should enable a safe takeover and ensure that a failure does not result in an unintentional and/or critical system status.

11.4 The failure of a single task station should not result in the loss of a function mandated by the carriage requirements of SOLAS.

11.5 In case of a breakdown of one task station, at least one task station should be able to take over the tasks.

12 System failures and fallback arrangements

12.1 The systems should have the capability of allowing the operator to decline or override the automated ship control functions at any time or intervene part way through a process by means of a simple operator action.

12.2 An integrated system should have the capability to re-establish the functional consistency after an interface failure.

12.3 Software requirements should be in compliance with resolution A.694(17) and in accordance with specifications at least equivalent to those acceptable to the Organization[1].

Module D – Interfacing

13 Interfacing, data transfer

13.1 To support a modular bridge design standardized interfaces should be implemented for sensor/source and operational/functional modules. Guidance on requirements for standardized interfaces is listed in resolution MSC.252(83).

13.2 The communication should allow the implementation of the tasks/functions listed in these guidelines.

13.3 The communication should be based on standardized communication protocol as far as applicable. Sensor/source and operational/functional modules may use alternative internal concepts.

13.4 This communication should be in compliance within the following requirements as far as practicable:

.1 self-alignment of interface parameters;

.2 automatic re-synchronization after disconnection or power failure;

.3 unique identification of data source which includes at least cluster, function, additionally time where necessary;

.4 provision of consistent data related to time and other relevant aspects, e.g., reference points; and

.5 ensure the consistency of data transmission.

[1] IEC 60945.

14 Power supply

14.1 The power supply requirements applying to parts of an integrated system as a result of the requirements specified for the individual equipment by the Organization should remain applicable.

14.2 Mandatory equipment and functions/equipment necessary for the safe navigation should be supplied at least:

.1 from both the main and the emergency source of electrical power with automated changeover through a local distribution board with provision to preclude inadvertent shutdown; and

.2 from a transitional source of electrical power for a duration of not less than 45 s.

Module E – System configuration and integration

15 Modular concept

The design of an integrated system should be modular with operational/functional and sensor/source modules. The modules are defined in the guidelines for the application of the modular concept to performance standards (SN.1/Circ.274).

16 Integration

16.1 The integration of functions of individual equipment into an integrated system should not degrade the performance below the requirements specified for the individual equipment by the Organization.

16.2 Integrated systems and integrations combining on a functional level at least two tasks specified in resolution MSC.252(83) or one task and track control should conform regarding the integration of information to the relevant requirements of Module A of resolution MSC.252(83).

16.3 For integrated systems or integrations that do not meet the definition of an INS according to resolution MSC.252(83), the principles of the INS performance standards should be applied as appropriate to the functions being integrated.

Module F – System and equipment documentation

17 Manuals

17.1 Operating manuals should be provided which include as far as applicable:

- functional description
- the redundancy and backup concept and the availability of functions
- default modes and limits
- a description of alerts and related failures and their effects on the system
- guidance for the adjustment of the limits for alerts

- details of each data convention and common references: attitude axis, rotation, reference location of Consistent Common Reference Point (CCRP)
- for automatic control functions (e.g., for heading, track or speed) details of override and/or bypassing.

17.2 Installation manuals should be provided to allow the systems to be installed so that they can meet all requirements adopted by the Organization.

17.3 The installation manuals should include:

- information of systems, sensor/sources, components, interconnections, automatic control functions and interfaces
- the details of the power supply arrangements
- recommendations on the physical layout of equipment and necessary space for maintenance.

18 Information regarding system configuration for surveyor

18.1 Manufacturer or system integrator should declare the following information relating to the system configuration, if applicable:

- basic system configuration
- interconnecting block diagram (Hardware) showing all connected sensors including power supply.

Further information is provided in resolution A.997(25).

18.2 Failure analysis, at functional level, should be documented as far as practicable. The failure analysis should verify that the systems are designed on "fail-to-safe" principle and that a failure of one part of an integrated system should not affect the functionality of other parts, except for those functions directly dependent on the defective part.

19 Guidance to equipment manufactures for the provision of onboard familiarization material

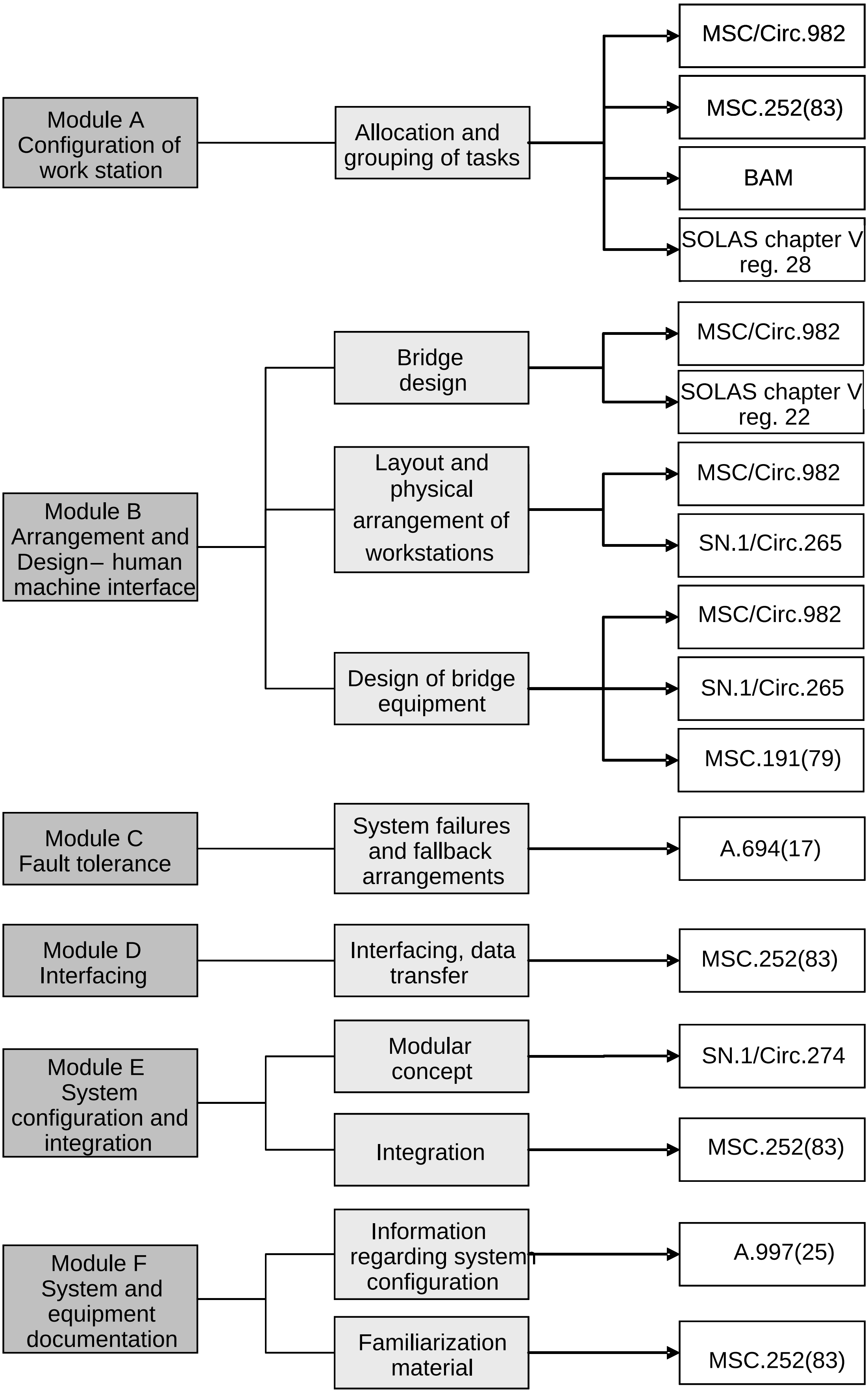
19.1 Material enabling onboard familiarization training should be provided. The onboard familiarization material should explain all configuration, functions, limitations, controls, displays, alerts and indications. Guidance for equipment manufactures for the provision of onboard familiarization material is listed in appendix 2 of resolution MSC.252(83) for INS.

Appendix 1 – Definitions

Cluster	Group of functions on a high level, e.g., navigation, automation.
Degraded condition	Reduction in system functionality resulting from failure.
Failure analysis	The logical, systematic examination of an item, including its diagrams or formulas, to identify and analyse the probability, causes and consequences of potential and real failures.
Human machine interface (HMI)	The part of a system an operator interacts with. The interface is the aggregate of means by which the users interact with a machine, device, and system. The interface provides means for input, allowing the users to control the system and output, allowing the system to inform the users.
Integrated navigation system	An INS is a composite navigation system which performs at least the following tasks: collision avoidance, route monitoring thus providing "added value" for the operator to plan, monitor and safely navigate the progress of the vessel. The INS allows meeting the respective parts of SOLAS regulation V/19 and supports the proper application of SOLAS regulation V/15.
Integration	Combining of data, functions and/or operations to accomplish a high-level aim.
Interfacing	Communication between equipment and between equipment and humans.
Multifunction display	A single visual display unit that can present, either simultaneously or through a series of selectable pages, information from more than a single function of an INS.
Mode awareness	The perception of the mariner regarding the currently active Modes of Control, Operation and Display of the INS including its subsystems, as supported by the presentations and indications at an INS display or workstation.
One equipment concept	The equipment which is recognized as one type of equipment by integrating the function of mandatory equipment of SOLAS of a plural number.
Operational/functional module	The module specifies the operational and functional capabilities of systems and equipment.

Sensor/source module	The module specifies the sensor/source performance of systems and equipment.
Simple operator action	A procedure achieved by no more than two hard-key or soft-key actions, excluding any necessary cursor movements, or voice actuation using programmed codes.
Single operator action	A procedure achieved by no more than one hard-key or soft-key action, excluding any necessary cursor movements, or voice actuation using programmed codes.
Situation awareness	Situation awareness is the mariner's perception of the navigational and technical information provided, the comprehension of their meaning and the projection of their status in the near future, as required for timely reaction to the situation. Situation awareness includes mode awareness.
Task	Work to be performed by bridge team and pilot.
Task station	Multifunction display with dedicated controls providing the possibility to display and operate multiple tasks. A task station is part of a workstation.
Workstation	The combination of all job-related items, including the console with all devices, equipment and the furniture, to fulfil certain tasks. Workstations for the Bridge are specified in MSC/Circ.982.

Appendix 2 – Guidance for applicable instruments which are specifically addressed within these guidelines



DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER V

1 The Maritime Safety Committee, at its [eighty-seventh session] (12 to 21May 2010), with a view to providing more specific guidance for vague expressions such as "The ship's side shall be visible from the bridge wing", which are open to different interpretations contained in IMO instruments, approved the unified interpretations of SOLAS chapter V prepared by the Sub-Committee on Safety of Navigation, as set out in the annex.

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of SOLAS chapter V to ships contracted for construction[1] on or after [1 January 2011] and to bring the unified interpretations to the attention of all parties concerned.

[1] The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder.

ANNEX

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER V

Regulation V/22.1.6 – Navigation bridge visibility

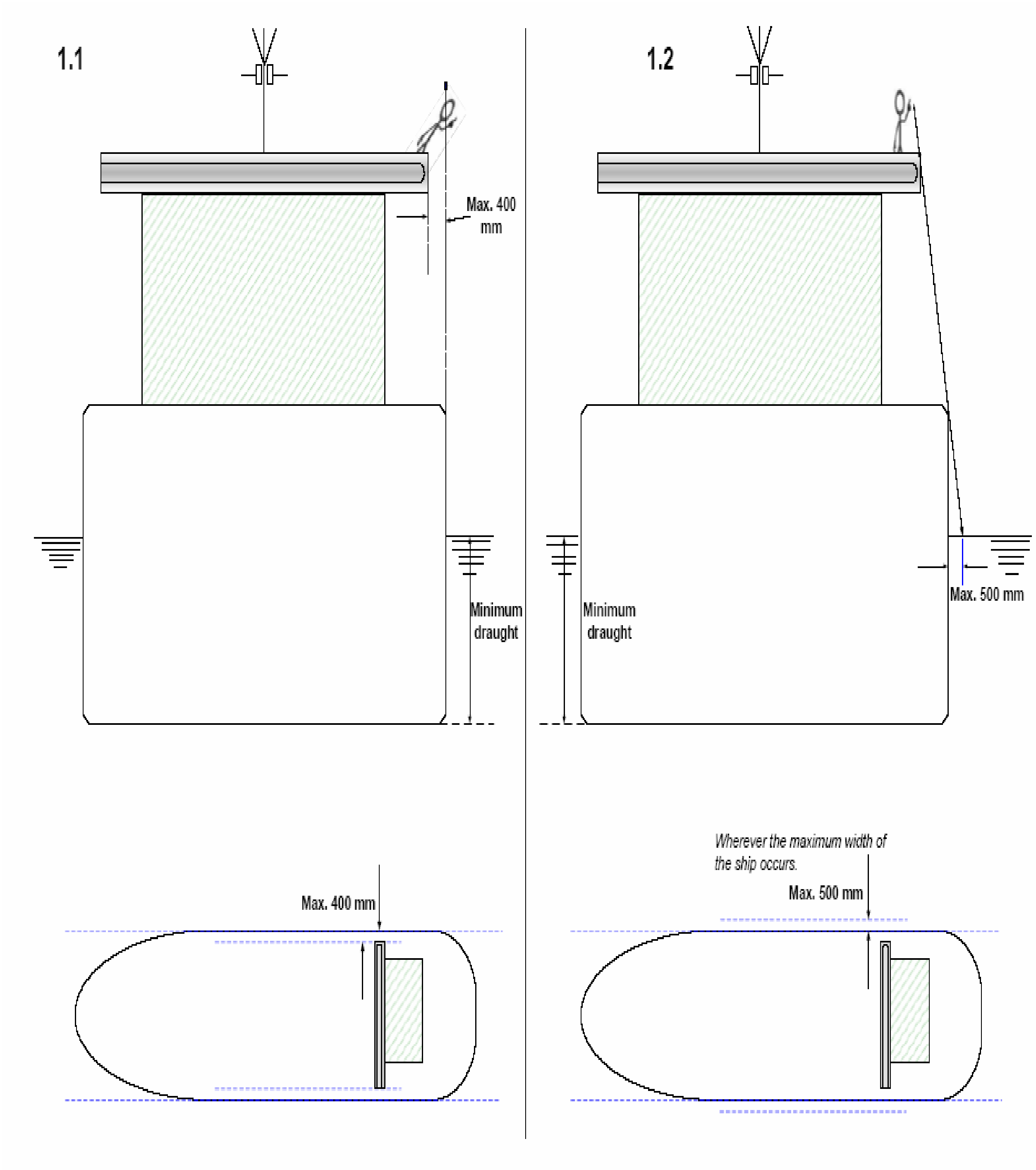
1 The requirements of SOLAS regulation V/22.1.6 are accomplished when:

.1 a view from the bridge wing plus a distance corresponding to a reasonable and safe distance of a seafarer leaning over the side of the bridge wing, which needs not to be more than 400 mm, to the location vertically right under the maximum beam of the ship at the lowest seagoing draught is not obscured; or

.2 the sea surface at the lowest seagoing draught and with a transverse distance of 500 mm and more from the maximum beam throughout the ship's length is visible from the side of the bridge wing.

2 A schematic diagram depicting the unified interpretations is also attached herewith.

3 For particular types of ships such as tug/tow boat, offshore supply vessel (OSV), rescue ship, work ship (e.g., Floating Crane), etc., in meeting the requirements of SOLAS regulation V/22.1.6, the bridge wings should at least extend to a location from which the sea surface, at the lowest seagoing draught and at a transverse distance of 1,500 mm from the maximum beam throughout the ship's length, is visible. If this ship type is changed through conversion then this interpretation in this paragraph would no longer apply.


1.1
Max. 400 mm
Minimum draught
1.2
Max. 500 mm
Minimum draught
Max. 400 mm
Wherever the maximum width of the ship occurs.
Max. 500 mm

***

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Ref. T2-OSS/2.7.1

SN.1/Circ.289
2 June 2010

GUIDANCE ON THE USE OF AIS APPLICATION-SPECIFIC MESSAGES

1 The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), approved SN/Circ.236 on Guidance on the application of AIS binary messages as prepared by the Sub-Committee on Safety of Navigation at its forty-ninth session (30 June to 4 July 2003).

2 The Sub-Committee on Safety of Navigation, at its forty-ninth session (30 June to 4 July 2003), selected seven (7) binary messages as shown in annex 2 to SN/Circ.236 to be used as a trial set of messages for a period of four years with no change. It was noted that four additional system-related messages were identified in Recommendation ITU-R M.1371 for the operation of the system.

3 The Sub-Committee on Safety of Navigation, at its fifty-fifth session (27 to 31 July 2009), after evaluating the use of binary messages in the trial period defined in SN/Circ.236, agreed on Guidance on the use of AIS Application-Specific Messages, including messages which are recommended for international use.

4 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), concurred with the Sub-Committee's views and approved the Guidance on the use of AIS Application Specific Messages, as set out at annex.

5 Member Governments are invited to bring the annexed Guidance to the attention of all concerned.

6 This circular revokes SN/Circ.236 as from 1 January 2013.

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ANNEX

GUIDANCE ON THE USE OF AIS APPLICATION-SPECIFIC MESSAGES

1 Summary of AIS Application-Specific Messages

1.1 This document provides an overview of the purpose and scope of AIS Application-Specific Messages, and provides guidance on their use. AIS Application-Specific Messages described in this document are recommended for broad international use.

1.2 Table 1 provides a list of the AIS binary messages contained in SN/Circ.236 and the revised/new AIS Application-Specific Messages contained in this Guidance.

Table 1
Summary of AIS Application-Specific Messages recommended for international use

FI	Message Name	Comments	Section
11	Met/Hydrological	SN/Circ.236 Trial message 1; not to be used after [1 Jan 2013]	--
12	Dangerous cargo indication	SN/Circ.236 Trial message 2; not to be used after [1 Jan 2013]	--
13	Fairway closed	SN/Circ.236 Trial message 3; not to be used after [1 Jan 2013]	--
14	Tidal window	SN/Circ.236 Trial message 4; not to be used after [1 Jan 2013]	--
15	Extended ship static and voyage-related data	SN/Circ.236 Trial message 5; not to be used after [1 Jan 2013]	--
16	Number of persons on board	SN/Circ.236 Trial message 6; corrected	5
17	VTS-generated/synthetic targets	SN/Circ.236 Trial message 7; renamed to "VTS-generated/Synthetic targets"	6
18	Clearance time to enter port	New message	7
19	Marine traffic signal	New message	8
20	Berthing data	New message	9
21	Weather observation report from ship	New message	10
22	Area notice – broadcast	New message	11
23	Area notice – addressed	New message	11
24	Extended ship static and voyage-related data	New message	4
25	Dangerous cargo indication	New message	2
26	Environmental	New message	12
27	Route information – broadcast	New message	13
28	Route information – addressed	New message	13
29	Text description – broadcast	New message	14

FI	Message Name	Comments	Section
30	Text description – addressed	New message	14
31	Meteorological and Hydrographic data	New message	1
32	Tidal window	New message	3
33-63		**Reserved for Future Use**	

1.3 The following system-related messages described in Annex 5 to Recommendation ITU-R M.1371-3 are also recommended for international use:

.1 Interrogation for a specific IFM (FI = 2);

.2 Capability interrogation (FI = 3);

.3 Capability reply (FI = 4); and

.4 Application acknowledgement to an addressed binary message (FI = 5).

2 System requirements

2.1 AIS Application-Specific Messages are transmitted and received by shipborne mobile AIS devices and AIS base stations. Shore-based stations can receive AIS Application-Specific Messages and distribute them to shore-based users.

2.2 The display capability of AIS Application-Specific Messages is not part of the mandatory functions of the Minimum Keyboard and Display (MKD). The display of the information transmitted by AIS Application-Specific Messages requires external hardware and dedicated software in addition to the AIS equipment.

2.3 The generation and transmission of AIS Application-Specific Messages also requires dedicated software and suitable equipment for entering the information.

3 Purpose and scope of AIS Application-Specific Messages

3.1 AIS was originally developed as a means for positive identification and tracking of ships. This was accomplished by transmitting and receiving static, dynamic, and voyage-related data about ships, as well as short safety-related messages. In addition, AIS was beneficial to the safety of navigation and protection of the environment by monitoring the maritime traffic and by providing various basic services. In particular, AIS may use binary messages for transmission of Application-Specific Messages as a means for certain types of limited communications.

3.2 AIS Application-Specific Messages may be either addressed or broadcasted. The technical characteristic and the structure of the AIS Application-Specific Messages are specified in Recommendation ITU-R M.1371. The content and format of the AIS Application-Specific Messages were tailored to different applications and were defined by the International Maritime Organization (IMO)

3.2.1 The transmission of any addressed AIS Application-Specific Message prompts a system acknowledgement on the VHF Data Link (VDL) by the receiving AIS station. This acknowledgement should not be confused with a user acknowledgment.

3.3 To avoid system overload, the number of AIS Application-Specific Messages and the frequency of transmission should be limited. Therefore, AIS Application-Specific Messages should be approved only if there is a compelling operational need for them. These messages have to be distinguished from "Addressed Safety-related Messages" and "Broadcast Safety-related Messages" both of which allow the exchange of format-free ASCII-text.

3.4 To obtain a high probability for reception, message transmissions should be made with access method Fixed Access Time Division Multiple Access (FATDMA) in reserved time slots. IALA Recommendation A124 Ed. 1.3 on AIS Shore Station and Networking Aspect relating to the AIS Service recommends FATDMA allocations not exceeding three (3) consecutive slots. As a general rule, messages occupying more than three (3) slots should be avoided, unless there is a low load on the VDL or a compelling reason to do so.

3.5 AIS Application-Specific Messages may provide a variety of capabilities for pre-defined information packages. For example:

- ships to report information to other ships and shore stations;

- shore stations to report navigation information, conditions and warnings; and

- ship reporting to be simplified.

3.5.1 It is also possible to interrogate a ship for a specific message and automatically receive the requested information, provided that the ship has the appropriate equipment installed. Moreover, AIS Application-Specific Messages may reduce verbal communications and enhance reliable information exchange and reduce operator's workload. AIS Application-Specific Messages are not intended to replace standard services such as the Global Maritime Distress and Safety System (GMDSS) and Search and Rescue Services (SAR).

4 Use of AIS Application-Specific Messages

4.1 The use of AIS Application-Specific Messages is permissible. AIS Application-Specific Messages may be created based on automatically generated or manual input. Pre-defined forms may be used to generate a message.

4.1.1 Since the use of AIS Application-Specific Messages places an additional load on the VDL, care must be taken to ensure the integrity of the VDL and not to impair the main functions of AIS. In this regard, longer AIS Application-Specific Messages and frequently transmitted messages have a greater impact on the VDL.

4.2 To ensure the safe use of the VDL, it may be beneficial that Contracting Governments appoint one national administration with a task to monitor and coordinate the use of the VDL within its area of responsibility. Slot utilizations should be monitored to determine the feasibility of using AIS Application-Specific Messages in the intended area. Further, this monitoring process should be conducted on an ongoing basis.

4.2.1 To determine if there is a risk for overload of the VDL, the operational requirements on coverage and received reporting rates for the main function of AIS must be compared with the actual performance. Overloading of the VDL may be indicated when the actual received reporting rate from ships within the required reporting area falls below the required reporting rate.

4.3 Although shipborne AIS equipments are capable of receiving AIS Application-Specific Messages, they may not be properly processed and displayed. [SN.1/Circ.[…] provides general Guidance for the presentation and display of AIS Application-Specific Messages.]

5 General format considerations for all messages

5.1 All geographical positions and coordinate points (latitude and longitude) should be based on the WGS 84 datum.

5.2 All times should be indicated as Coordinated Universal Time (UTC).

5.3 All directions indicated are true north.

ANNEX

**AIS APPLICATION-SPECIFIC MESSAGES
RECOMMENDED FOR INTERNATIONAL USE**

1 Meteorological and Hydrographic data

1.1 This message allows the distribution of meteorological and hydrographic information.

1.2 This message should not be transmitted when positional information or time of measurement are not available. If there is no data available for that particular data field, it should be displayed as "not available".

1.3 Not all the information specified in the table 1.1 will be available at all stations.

**Table 1.1
Meteorological and Hydrographic data**

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Spare	2	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 31**
Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 = not available = default
Position Accuracy	1	1 = high (<10 m; Differential Mode of, e.g., DGNSS receiver) 0 = low (>10 m; Autonomous Mode of, e.g., GNSS receiver or of other electronic position fixing device) default = 0
Time Stamp		UTC date and time of the data.
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default

Parameter	No. of bits	Description
Average Wind Speed	7	Average of wind speed values for the last 10 minutes, in 1 knot steps. 0 - 125 knots 126 = wind 126 knots or greater 127 = not available = default
Wind Gust	7	Maximum wind speed reading during the last 10 minutes, in 1 knot steps. 0 - 125 knots 126 = wind 126 knots or greater 127 = not available = default
Wind Direction	9	Direction of the average wind during the last 10 minutes, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Wind Gust Direction	9	Direction of the maximum wind during the last 10 minutes, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (not for use)
Air Temperature	11	Dry bulb temperature in degrees Celsius (as per 2's complement), in 0.1 degree steps. -60 to +60 degrees Celsius 601 - 1,023 (reserved for future use) -1,024 = data not available = default -1,023 to -601 (reserved for future use)
Relative Humidity	7	Relative Humidity, in 1% steps. 0 - 100% 101 = not available = default 102 -127 (reserved for future use)
Dew Point	10	Dew point temperature in degrees Celsius (as per 2's complement), in 0.1 degree steps. -20.0 to +50.0 degrees 501 = not available = default 502 - 511 (reserved for future use) -511 to -201 (reserved for future use)
Air Pressure	9	Air pressure, defined as pressure reduced to sea level, in 1 hPa steps. 0 = pressure 799 hPa or less 1 - 401 = 800 - 1200 hPa 402 = pressure 1201 hPa or greater 403 - 510 (reserved for future use) 511 = not available = default
Air Pressure Tendency	2	0 = steady 1 = decreasing 2 = increasing 3 = not available = default

Parameter	No. of bits	Description
Horizontal Visibility	8	Horizontal visibility, in 0.1 Nautical Miles steps (00000000 to 01111111). 0.0 - 12.6 Nautical Miles The most significant bit (MSB) indicates that the maximum range of the visibility equipment was reached and the reading shall be regarded as > x.x NM. (e.g., if 10110010, then visibility is 5.0 NM or greater) 127 = data not available = default
Water level (incl. tide)	12	Deviation from local chart datum, in 0.01 metre steps. -10.0 to +30.0 metres A value representing 0 - 4,000 is sent by the 12 binary bits. The water level is achieved by adding -10.0 to the sent value. Water level = (Integer value /100) – 10 for Integer = 0-4,000 4,001 = not available = default 4,002 – 4,095 (reserved for future use)
Water Level Trend	2	0 = steady 1 = decreasing 2 = increasing 3 = not available = default
Surface Current Speed (incl. tide)	8	Speed of Current measured at the sea surface, in 0.1 knot steps. 0.0 - 25.0 knots 251 = speed 25.1 knots or greater 255 = not available = default 252-254 (reserved for future use)
Surface Current Direction	9	Direction of Current at the sea surface, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Current Speed, #2	8	Speed of Current 2 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as Surface Current Speed)
Current Direction, #2	9	Direction of Current 2, in 1 degree steps. (Same as Surface Current Direction)
Current Measuring level, #2	5	Measuring level below sea surface, in 1 metre increment. 0 - 30 metres 31 = not available = default
Current Speed, #3	8	Speed of Current 3 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as Surface Current Speed)
Current Direction, #3	9	Direction of Current 3, in 1 degree steps. (Same as Surface Current Direction)
Current Measuring level, #3	5	Measuring level below sea surface, in 1 metre steps. 0 - 30 metres 31 = data not available = default
Significant Wave Height	8	Height of the waves, in 0.1 metre steps. 0.0 - 25.0 metres 251 = height 25.1 metres or greater 255 = data not available = default 252 - 254 (reserved for future use)

Parameter	No. of bits	Description
Wave Period	6	Wave period, in 1 second steps. 0 - 60 seconds 61 - 62 (reserved for future use) 63 = not available = default
Wave Direction	9	Direction of waves, in 1 degree steps. 0 - 359 degrees 360 = data not available = default 361 - 511 (reserved for future use)
Swell Height	8	Height of the swell, in 0.1 metre steps. 0.0 - 25.0 metres 251 = height 25.1 metres or greater 255 = data not available = default 252 - 254 (reserved for future use)
Swell Period	6	Swell period, in 1 second steps. 0 - 60 seconds 61 - 62 (reserved for future use) 63 = not available = default
Swell Direction	9	Direction of swells, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Sea State	4	Beaufort Scale, as defined in Table 1.2
Water Temperature	10	Temperature of the water in degrees Celsius (as per 2's complement), in 0.1 degree steps. -10.0 to +50.0 degrees 501 = data not available = default 502 - 511 (reserved for future use) -511 to -101 (reserved for future use)
Precipitation (type)	3	According to WMO 306 Code table 4.201: 0 = reserved 1 = rain 2 = thunderstorm 3 = freezing rain 4 = mixed/ice 5 = snow 6 = reserved 7 = not available = default
Salinity	9	Salinity, in 0.1‰ (ppt) steps. 0.0 - 50.0 ‰ 50.1 = salinity 50.1 ‰ or greater 510 = not available = default 511 = sensor not available 502 - 509 (reserved for future use)
Ice	2	0 = No 1 = Yes 2 = (reserved for future use) 3 = not available = default
Spare	10	Not used. Set to zero
Total	**360**	**Occupies 2 slots**

Table 1.2
Beaufort scale

Scale	Sea Conditions
0	Flat.
1	Ripples without crests.
2	Small wavelets. Crests of glassy appearance, not breaking.
3	Large wavelets. Crests begin to break; scattered whitecaps.
4	Small waves.
5	Moderate (1.2 m) longer waves. Some foam and spray.
6	Large waves with foam crests and some spray.
7	Sea heaps up and foam begins to streak.
8	Moderately high waves with breaking crests forming spindrift. Streaks of foam.
9	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.
10	Very high waves. The sea surface is white and there is considerable tumbling. Visibility is reduced.
11	Exceptionally high waves.
12	Huge waves. Air filled with foam and spray. Sea completely white with driving spray. Visibility greatly reduced.
13	not available = default
14 - 15	(reserved for future use)

2 Dangerous cargo indication

2.1 This message should be used in response to a request for a summary of the Dangerous cargo information from a competent authority.

2.2 The message content is intended to provide a non-verbal method of transfer of information on the general categories on dangerous cargoes, i.e. as an outline assessment of the categories of ships and their cargoes to facilitate in their participation in ship reporting systems and as initial information supporting search and rescue (SAR), anti-pollution, fire/chemical response or other incident/accident response operations. More detailed information can be found from the emergency contact details, the ship and other sources in due course.

2.3 The data is intended for use by the shore-based authority with the ability to relay this information on a selective and secure basis to the relevant national authorities responsible for receiving reports (i.e. Maritime Reporting System) and for VTS, SAR, pollution response, fire-fighting and other shore-based activities in response to accidents or incidents. The competent authority is responsible for ensuring that necessary measures are applied to secure the appropriate confidentiality of information.

2.4 Up to twenty-eight dangerous cargo can be specified. Each cargo should be structured as defined in tables 2.2 to 2.6 depending on the code used.

Table 2.1
Dangerous cargo indication – addressed

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6; always 6
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Sequence Number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1.
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted
Spare	1	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 25** (See ITU-R M.1371-3, Annex 5, § 2.1).
Unit of Quantity for Dangerous Cargo	2	0 = not available = default 1 = in kg 2 = in tonnes (10 E 3 kg) 3 = in 1,000 tonnes (10 E 6 kg)
Total Amount of Dangerous Cargo	10	0 = not available = default 1 - 1,023 = value of quantity (in units defined, above)

Parameter	No. of bits	Description
Code under which Cargo 1 is carried	4	0 = not available = default 1 = IMDG Code (in packed form) 2 = IGC Code 3 = BC Code (from 1.1.2011 IMSBC) 4 = MARPOL Annex I List of oils (Appendix 1) 5 = MARPOL Annex II IBC Code 6 = Regional use 7 - 15 (reserved for future use)
Cargo 1	13	Content depends on code selected. Refer to tables below.
Code under which Cargo 2 is carried	4	Optional. (Same as Cargo 1)
Cargo 2	13	Optional. Content depends on code selected. Refer to tables below.
Cargo …	n x (17)	…
Code under which Cargo 28 is carried	4	Optional. (Same as Cargo 1)
Cargo 28	13	Optional. Content depends on code selected. Refer to tables below.
Total	**117 - 576**	**Occupies 1 - 3 slots.** (See Table 2.7)

Table 2.2
IMDG Code

Parameter	No. of bits	Description
IMDG class or division	7	0 = not available = default 1 - 9 (not used) 10 - 99 = first digit = main class, second digit = subclass or division (undefined subclasses and divisions should not be used) 100 - 127 (reserved for future use)
Spare	6	Not used. Set to zero.
Total	**13**	

Table 2.3
IGC Code

Parameter	No. of bits	Description
UN number	13	0 = not available = default 1 - 3,363 = Four digits UN number 3,364 - 8,191 (reserved for future use)
Total	**13**	

Table 2.4
BC Code (from 1.1.2011 IMSBC)

Parameter	No. of bits	Description
BC class	3	0 = not available = default 1 = A 2 = B 3 = C 4 = MHB - Material Hazardous in Bulk 5 - 7 (reserved for future use)
IMDG class	7	Only specified for class B 0 = not available = default 1 - 9 (not used) 10 - 99 = first digit = main class, second digit = subclass (undefined subclasses should not be used) 100 - 127 (not used)
Spare	3	Not used. Set to zero.
Total	**13**	

Table 2.5
MARPOL Annex I, List of oils (Appendix 1)

Parameter	No. of bits	Description
Type of oil	4	0 = not available = default 1 = asphalt solutions 2 = oils 3 = distillates 4 = gas oil 5 = gasoline blending stocks 6 = gasoline 7 = jet fuels 8 = naphtha 9 - 15 (reserved for future use)
Spare	9	Not used. Set to zero.
Total	**13**	

Table 2.6
MARPOL (Annex II, IBC Code)

Parameter	No. of bits	Description
Category	3	0 = not available = default 1 = Category X 2 = Category Y 3 = Category Z 4 = other substances 5 - 7 (reserved for future use)
Spare	10	Not used. Set to zero.
Total	**13**	

Table 2.7
Number of slots

Number of cargoes in the message	1-2	3-15	16-28
Number of slots used	1	2	3

3 Tidal window

3.1 This message should be used to inform vessels about tidal windows which allow a vessel the safe passage of a fairway.

3.2 This message includes predictions of current speed and current direction.

3.3 Up to three points of tidal information can be specified.

Table 3.1
Tidal window

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6; always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station
Sequence Number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted
Spare	1	Not used. Set to zero.
IAI	16	DAC = 001; **FI =32**
Time Stamp		UTC date of the data.
UTC Month	4	1 - 12 0 = not available = default
UTC Day	5	1 - 31 0 = not available = default
Position #1 Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Position #1 Latitude	24	Latitude in 1/1,000 min, ±90 degrees, as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
From UTC Hour	5	0 - 23 24 = not available = default
From UTC Minute	6	0 - 59 60 = not available = default
To UTC Hour	5	0 - 23 24 = not available = default
To UTC Minute	6	0 - 59 60 = not available = default

Parameter	No. of bits	Description
Current Direction predicted #1	9	Direction of Current 1, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361-511 (do not use)
Current Speed predicted #1	8	Speed of Current 1, in 0.1 knot steps. 0.0 – 25.0 knots 251 = speed 25.1 knots or greater 252 – 254 (reserved for future use) 255 = not available = default
Position #2 Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Position #2 Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
From UTC Hour	5	0 - 23 24 = not available = default
From UTC Minute	6	0 - 59 60 = not available = default
Current Direction predicted #2	9	Direction of Current 2, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361-511 (do not use)
Current Speed predicted #2	8	Speed of Current 2, in 0.1 knot steps. 0.0 – 25.0 knots 251 = speed 25.1 knots or greater. 252 - 254 (reserved for future use) 255 = not available = default
Position #2 Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Position #3 Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
From UTC Hour	5	0 - 23 24 = not available = default
From UTC Minute	6	0 - 59 60 = not available = default
To UTC Hour	5	0 - 23 24 = not available = default
To UTC Minute	6	0 - 59 60 = not available = default
Current Direction predicted #3	9	Direction of Current 3, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (not used)

Parameter	No. of bits	Description
Current Speed predicted #3	8	Speed of Current 3, in 0.1 knot steps. 0.0 - 25.0 knots 251 = speed 25.1 knots or greater 252 - 254 (reserved for future use) 255 = not available = default
Total	**350**	**occupies 3 slots**

4 Extended ship static and voyage-related data

4.1 This message should be used to obtain additional extended and static voyage-related data.

Table 4.1
Extended ship static and voyage-related data (broadcast)

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Spare	2	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 24** (See ITU-R M.1371-3, Annex 5, § 2.1)
Message Linkage ID	10	A source specific running number, unique across all binary messages equipped with Message Linkage ID. Used to link additional information to the message by a Text Description message. The Message Linkage ID and the first six digits of the source MMSI uniquely identify the sent message. 1 - 1,023 0 = not available = default
Air Draught	13	Air Draught is the vertical distance from the ship's waterline to the highest point on the ship (e.g., top of ship's mast), in 0.1 metre steps. Air Draught = total vessel height (e.g., from bottom of keel to top of ship's mast) minus the maximum static loaded draught. 1 - 81.9 metres 81.91 = distance 81.91 metres or greater 0 = not available = default
Last Port of call	30	UN LOCODE; 5 characters 6 bits ASCII "@@@@@" = not available = default
Next Port of call	30	UN LOCODE; 5 characters 6 bits ASCII "@@@@@" = not available = default
Second Port of call	30	UN LOCODE; 5 characters 6 bits ASCII "@@@@@" = not available = default
SOLAS Equipment status	52	Current status of SOLAS navigation/communications equipment. Each equipment is described using 2 bits, coded as: 0 = not available or requested = default "00000000000000000000000000" 1 = equipment operational 2 = equipment not operational 3 = no data (equipment may or may not be on board/or its status is unknown) <u>Required SOLAS equipment (coded in the following order)</u> 1 = AIS Class A

Parameter	No. of bits	Description
		2 = ATA (Automatic Tracking Aid) 3 = BNWAS (Bridge Navigational Watch Alarm System) 4 = ECDIS Back-up 5 = ECDIS/Paper Nautical Chart 6 = echo sounder 7 = electronic plotting aid 8 = emergency steering gear 9 = navigation system (GPS, Loran-C, GLONASS) 10 = gyro compass 11 = LRIT 12 = magnetic compass 13 = NAVTEX 14 = radar (ARPA) 15 = radar (S-band) 16 = radar (X-band) 17 = radio HF 18 = radio INMARSAT 19 = radio MF 20 = radio VHF 21 = speed Log (over ground) 22 = speed Log (through water) 23 = THD (Transmitting Heading Device) 24 = track control system 25 = VDR/S-VDR 26 (reserved for future use)
Ice class	4	Ice Classes as defined by: IACS = International Association of Classification Societies PC = Polar Class. For further details, see IACS Req. 2007 *Requirements concerning POLAR CLASS* and MSC/Circ.1056 and MEPC/Circ.399 on *Guidelines for ships operating in Arctic ice-covered waters*. FSICR = Finnish-Swedish Ice Class Rules. For further details, see Finnish Maritime Administration's Bulletin No.10/10.12.2008 *Ice class regulations 2008 (Finnish-Swedish ice class rules)*. Note: Authorized classification society equivalents for the Finnish-Swedish Ice Class Rules should also be recognized, as issued in the Finnish Maritime Administration's Bulletin No.4/2.4.2007 (as amended). Both bulletins can be found at www.fma.fi. RS = Russian Maritime Register of Shipping. For further details see *Rules for the classification and construction of seagoing ships*, Edition 2008. 0 = not classified 1 = IACS PC 1 2 = IACS PC 2 3 = IACS PC 3 4 = IACS PC 4 5 = IACS PC 5 6 = IACS PC 6 / FSICR IA Super / RS Arc5 7 = IACS PC 7 / FSICR IA / RS Arc4 8 = FSICR IB / RS Ice3

Parameter	No. of bits	Description
		9 = FSICR IC / RS Ice2 10 = RS Ice1 11 - 14 (reserved for future use) 15 = not available = default
Shaft Horse power	18	Total horse power of ship, in 1 hp steps. 0 - 262,141 horse power 262,142 = 262,142 horse power or greater 262,143 = not available = default
VHF Working channel	12	The VHF working channel used by the sending vessel Channel number according to Recommendation ITU-R M.1084 0 = not available = default
Lloyd's Ship type	42	Lloyd's Register STATCODE 5 (e.g., A11A1AA); 7 characters 6 bits ASCII "@@@@@@@" = not available = default (See http://www.lrfairplay.com/About/IMO_standards/imo_standards.html)
Gross tonnage	18	0 - 262,141 262,142 = 262,142 or greater 262,143 = not available = default
Laden or Ballast	2	0 = not available = default 1 = Laden 2 = Ballast 3 = not in use
Type of bunker oil		
Heavy fuel oil	2	0 = not available = default 1 = no 2 = yes 3 = not in use
Light fuel oil	2	0 = not available = default 1 = no 2 = yes 3 = not in use
Diesel	2	0 = not available = default 1 = no 2 = yes 3 = not in use
Total amount of bunker oil in tonnes	14	0 - 16,381 16,382 = 16,382 tonnes or greater 16,383 = not available = default
Number of Persons	13	Number of persons currently on board, including crew members. 0 = not available = default 1 - 8,190 8,191 = 8,191 or greater
Spare	10	Not used. Set to zero.
Total	**360**	**Occupies 2 slots**

5 Number of persons on board

5.1 This message should be used by a ship to report the number of persons on board (e.g., on request by a competent authority).

Table 5.1
Number of persons on board

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6; always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Sequence Number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1.
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted
Spare	1	Not used. Set to zero.
IAI	16	DAC = 001; **FI =16** (see ITU-R M.1371-3, Annex 5, § 2.1).
Number of Persons	13	Number of persons currently on-board, including crew members. 0 = not available = default 1 - 8,190 8,191 = 8,191 or greater
Spare	35	Not used. Set to zero.
Total	**136**	**Occupies one slot**

6 VTS-generated/Synthetic targets

6.1 This message should be used to transmit VTS or other types of synthetic targets. This message can be variable in length, based on the amount of targets. The maximum number of Targets transmitted in one message should not exceed four (4).

6.2 A VTS-generated or synthetic target should only be used when the position of the target is known.

Table 6.1
VTS-generated/Synthetic targets

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	Name of source station.
Spare	2	Not used. Set to zero.
IAI	16	DAC = 001; **FI =17**
Target 1	120	Refer to Table 6.2
Target 2	120	Optional; refer to Table 6.2
Target 3	120	Optional; refer to Table 6.2
Target 4	120	Optional; refer to Table 6.2
Total	**max 536**	**Occupies 2 - 3 slots**

Table 6.2
Structure of the target

Parameter	No. of bits	Description
Type of Target Identifier	2	Identifier Type: 0 = The target identifier is the MMSI number 1 = The target identifier is the IMO number. 2 = The target identifier is the call sign 3 = Other (default)
Target Identifier	42	The Target Identifier depends on Type of Target Identifier (see above). When call sign or vessel name is used, it should be inserted using 6-bits ASCII characters. When MMSI or IMO number is used, the least significant bit should equal bit zero of the Target Identifier. If the target identity is unknown, Type of Target Identifier should be set to "3" and Target Identifier to "@@@@@@@".
Spare	4	Spare. Set to zero.

Parameter	No. of bits	Description
Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Course-over-ground (COG)	9	COG in degrees, in 1 degree steps. 0 - 359 360 = not available = default
Time Stamp	6	UTC time when the report was generated. 0 - 59 seconds 60 = not available = default
Speed-over-ground (SOG)	8	SOG in knots, in 1 knot steps. 0 - 254 255 = not available = default
Total	**120**	

7 Clearance time to enter port

7.1 This message provides specific ships with information on the granted port to call and time to enter.

7.2 This message is transmitted by a competent authority responsible for control of ships to enter/leave port.

Table 7.1
Clearance time to enter port (addressed)

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6, always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Sequence Number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1.
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted
Spare	1	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 18**
Message Linkage ID	10	A source specific running number, unique across all binary messages equipped with Message Linkage ID. Used to link additional information to the message by a Text Description message. The Message Linkage ID and the first six digits of the source MMSI uniquely identify the sent message. 1 - 1,023 0 = not available = default
Clearance date/time to enter port		UTC date and time.
UTC Month	4	1 - 12 0 = not available = default
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default
Name of port and berth	120	Name of the port and berth. Maximum 20 characters 6 bits ASCII as defined in ITU-R M. 1371-3, Table 44. "@@@@@@@@@@@@@@@@@@@@" = not available = default

Parameter	No. of bits	Description
Destination	30	UN LOCODE; 5 characters 6 bits ASCII "@@@@@" = not available = default
Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
Spare	43	Not used. Set to zero.
Total	**360**	**Occupies 2 slots**

8 Marine traffic signal

8.1 This message provides information on a signal station and status of the control signal at the entrance of a harbour or channel where the shipping direction controlled so that the traffic flow be kept in order.

8.2 This message is transmitted by a competent authority.

Table 8.1
Marine traffic signal

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Spare	2	Not used. Set to zero.
IAI	16	DAC =001; **FI = 19**
Message Linkage ID	10	A source specific running number, unique across all binary messages equipped with Message Linkage ID. Used to link additional information to the message by a Text Description message. The Message Linkage ID, source MMSI and message FI uniquely identifies the sent message. 1 - 1,023 0 = not available = default
Name of Signal Station	120	Maximum 20 characters 6 bits ASCII, as defined in ITU-R M. 1371-3, Table 44 "@@@@@@@@@@@@@@@@@@@@" = not available = default
Position of Station, Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Position of Station, Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
Status of Signal	2	0 = not available = default 1 = In regular service 2 = Irregular service 3 reserved for future use
Signal in Service	5	(see Table 8.2)

Parameter	No. of bits	Description
Time of next Signal Shift		Time of next Signal Shift in UTC
UTC Hour	5	0 - 23 24 = not available = default 25 - 31 (not used)
UTC Minute	6	0 - 59 60 = not available = default 61 - 63 (not used)
Expected Next Signal	5	(see Table 8.2)
Spare	102	Not used. Set to zero.
Total	**360**	**Occupies 2 slots**

Table 8.2
Signal in Service[1]

Value	Description
0	Not available = default
1	IALA port traffic signal 1: Serious emergency – all vessels to stop or divert according to instructions.
2	IALA port traffic signal 2: Vessels shall not proceed.
3	IALA port traffic signal 3: Vessels may proceed. One way traffic.
4	IALA port traffic signal 4: Vessels may proceed. Two way traffic.
5	IALA port traffic signal 5: A vessel may proceed only when it has received specific orders to do so.
6	IALA port traffic signal 2a: Vessels shall not proceed, except that vessels which navigate outside the main channel need not comply with the main message.
7	IALA port traffic signal 5a: A vessel may proceed only when it has received specific orders to do so; except that vessels which navigate outside the main channel need not comply with the main message.
8	Japan Traffic Signal - I = "in-bound" only acceptable.
9	Japan Traffic Signal - O = "out-bound" only acceptable.
10	Japan Traffic Signal - F = both "in- and out-bound" acceptable.
11	Japan Traffic Signal - XI = Code will shift to "I" in due time.
12	Japan Traffic Signal - XO = Code will shift to "O" in due time.
13	Japan Traffic Signal - X = Vessels shall not proceed, except a vessel which receives the direction from the competent authority.
14 - 31	(reserved for future use)

[1] For further details, see IALA Recommendation E-111 on *Port Traffic Signals*, Edition 1.1, December 2005.

9 Berthing data

9.1 This message provides information on the ship's berth. If sent from a ship it is a berthing request; if it is transmitted by a competent authority it is a berthing assignment.

Table 9.1
Berthing data (addressed)

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6; always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Sequence Number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1.
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted.
Spare	1	Not used, S set to zero.
IAI	16	DAC = 001; **FI = 20**
Message Linkage ID	10	A source specific running number, unique across all binary messages equipped with Message Linkage ID. Used to link additional information to the message by a Text Description message. The Message Linkage ID and the first six digits of the source MMSI uniquely identify the sent message. 1 - 1,023 0 = not available = default.
Berth Length	9	Berth length, in 1 metre steps. 1 - 510 metres 511 = 511 metres or greater 0 = undefined = default
Water Depth at Berth	8	Water depth at berth, in 0.1 metre steps. 0.1 - 25.4 metres 255 = 25.5 or greater 0 = undefined = default
Mooring Position	3	0 = undefined = default 1 = port-side to 2 = starboard-side to 3 = Mediterranean mooring 4 = mooring buoy 5 = anchorage 6 - 7 (reserved for future use)

Parameter	No. of bits	Description
Berth Date and Time		UTC Date and Time
UTC Month	4	1 - 12 0 = not available = default
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default
Services availability	1	0 = services types unknown = default; set all "Type of Services Available" indicated below to zero. 1 = services types are known; see "Type of Services Available" below.
Type of Services Available	52	Available services at berth. Each service described with 2 bits, coded as: 0 = service not available or requested = default 1 = service available 2 = no data or unknown 3 = not to be used <u>List of services</u> 1 = agent 2 = bunker/fuel 3 – chandler 4 = stevedore 5 = electrical 6 = potable water 7 = customs house 8 = cartage 9 = crane(s) 10 = lift(s) 11 = medical facilities 12 = navigation repair 13 = provisions 14 = ship repair 15 = surveyor 16 = steam 17 = tugs 18 = waste disposal (solid) 19 = waste disposal (liquid) 20 = waste disposal (hazardous) 21 = reserved ballast exchange 22 = additional services are also available 23 - 24 (reserved for regional use) 25 - 26 (reserved for future use)
Name of Berth	120	20 characters 6 bits ASCII, as defined in ITU-R M. 1371-3, Table 44.
Centre position of Berth, Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default

Parameter	No. of bits	Description
Centre position of Berth, Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
Spare	0	Not used. Set to zero.
Total	**360**	**Occupies 2 slots**

10 Weather observation report from ship

10.1 This message provides weather information observed on a ship in navigation.

10.2 Two different messages can be transmitted:

.1 Weather observation report from ship; or

.2 WMO Weather observation report from ship.

10.3 Table 10.1 outlines the parameters associated with the Weather observation report from ship message.

10.4 Table 10.2 outlines the parameters associated with the WMO Weather observation report from ship message.

10.4.1 The WMO Weather observation report from ship message is intended for ships which have been recruited by national meteorological services to undertake weather observations at sea in accordance with the provisions of SOLAS chapter V, regulation 5, and the World Meteorological Organization's Voluntary Observing Ship (VOS) Scheme. Because national meteorological services are the intended primary users of this message it has been developed to reflect the coding principles prescribed by WMO in its Binary Universal Form for the Representation of meteorological data (BUFR), and as contained in Part B of WMO Publication No.306, (Manual Codes, Volume I.2). The parameters coded in this message are therefore not fully compatible with the recommendations set out in ITU M.1371-3.

10.4.2 The WMO Weather observation report from ship message includes all the parameters that are typically reported by voluntary observing ships, as well as additional parameters reported by ships that are recruited to the VOS Scheme to report climate quality weather observations (indicated as VOSClim parameters in the message description). The message format also accords with formats being developed for use in connection with shipboard automatic weather stations.

Table 10.1
Weather observation report from ship

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Spare	2	Not used. Should be set to zero.
IAI	16	DAC = 001; **FI = 21**
Type of Weather report	1	Always 0
Geographic Location	120	20 characters 6-bits ASCII as defined in ITU-R M. 1371-3, Table 44

Parameter	No. of bits	Description
Position of Observation, Longitude	25	Longitude in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Position of Observation, Latitude	24	Latitude in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
Date and Time of Observation		UTC Date and time of observation.
UTC Day	5	1 - 31 0 = not available
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default
Present Weather	4	(Based on WMO Code 45501) 0 = clear (no clouds at any level) 1 = cloudy 2 = rain 3 = fog 4 = snow 5 = typhoon/hurricane 6 = monsoon 7 = thunderstorm 8 = not available = default 9 - 15 (reserved for future use)
Horizontal Visibility	8	Horizontal visibility, in 0.1 Nautical Miles steps (00000000 to 01111111). 0.0 - 12.6 Nautical Miles The most significant bit (MSB) indicates that the maximum range of the visibility equipment was reached and the reading shall be regarded as > x.x NM. (e.g., if 10110010, then visibility is 5.0 NM or greater) 127 = data not available = default
Relative Humidity	7	Relative Humidity, in 1% steps. 0 - 100% 101 = not available = default 102 -127 (reserved for future use)
Average Wind Speed	7	Average of wind speed values over the last 10 minutes, in 1 knot steps. 0 - 125 knots 126 = wind 126 knots or greater 127 = not available = default
Wind Direction	9	Direction of the average wind over the last 10 minutes, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)

Parameter	No. of bits	Description
Air Pressure	9	Air pressure at sea level, in 1 hPa steps. 0 = pressure 799 hPa or less 1 - 401 = 800 – 1200 hPa 402 = pressure 1201 hPa or greater 403 = not available = default 404 - 511 (reserved for future use).
Air Pressure tendency	4	Use WMO FM13 Codes for pressure characteristic over the last three hours. Codes 0 - 8
Air Temperature	11	Dry bulb temperature in degrees Celsius (as per 2's complement), in 0.1 degree steps. -60.0 to +60.0 degrees -1,024 = data not available = default 601 - 1,023 (reserved for future use) -1,023 to -601 (reserved for future use)
Water Temperature	10	Temperature of the water in degrees Celsius (as per 2's complement), in 0.1 degree steps. -10.0 to +50.0 degrees 501 = not available=default 502 - 511 (reserved for future use) -511 to -101 (reserved for future use)
Wave period	6	Wave period, in 1 second steps 0 - 60 seconds 63 = not available = default 61 - 62 (reserved for future use)
Significant Wave height	8	Height of the waves, in 0.1 metre steps. 0.0 - 25.0 metres 251 = height 25.1 metres or greater 255 = not available = default 252 - 254 (reserved for future use)
Wave Direction	9	Direction of waves, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Swell Height	8	Height of the swell, in 0.1 metre steps. 0.0 - 25.0 metres 251 = height 25.1 metres or greater 255 = not available = default 252 - 254 (reserved for future use)
Swell Direction	9	Direction of swells, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Swell Period	6	Swell period, in 1 second steps. 0 - 60 seconds 63 = not available = default 61 - 62 (reserved for future use)

Parameter	No. of bits	Description
Spare	3	Not used. Set to zero.
Total	**360**	**Occupies 2 slots**

Table 10.2
WMO Weather observation report from ship

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station
Spare	2	Not used. Set to zero.
IAI	16	DAC = 001; **FI =21**
Type of weather report	1	always 1
Position of Observation, Longitude	16	BUFR 006002 Longitude in 1/100 min, ±180 degrees (East = positive, West = negative) Lon = (Integer value / 100) – 180 for Integer = 0 - 36,000 65,535 = not available = default
Position of Observation, Latitude	15	BUFR 005002 Latitude in 1/100 min, ±90 degrees as per 2's complement (North = positive, South = negative) Lat = (Integer value / 100) – 9,000 for Integer = 0 - 18,000 32,767 = not available = default

Parameter	No. of bits	Description
Date and Time of Observation		UTC Date and time of observation.
UTC Month	4	BUFR 004002 1 - 12 (offset = 0) Month = Integer value 15 = not available = default
UTC Day	6	BUFR 004003 1 - 31 (offset = 0) Day = (Integer value) for integer = 1-31 63 = not available = default
UTC Hour	5	BUFR 004004 0 - 23 (offset = 0) Hour = Integer value 31 = not available = default
UTC Minute	3	BUFR 004005 0 - 50 (offset = 0) Minute = (Integer value * 10) for integer = 0-5 7 = not available = default
Ship's Course Over Ground (over the past 10 minutes)	7	BUFR 001012 (VOSClim parameter) 005 - 360 deg. (offset = 0) COG = (Integer value * 5) for Integer = 1 - 72 0 = stopped 127 = not available = default
Average Speed Over Ground (over the past 10 minutes)	5	BUFR 001013 (VOSClim parameter) 0 - 14.5 m/s (offset = 0) SOG = (Integer value * 0.5) for Integer = 0 - 29 30 = 15 m/s and more 31 = not available = default
Average heading of the ship (over the past 10 minutes)	7	BUFR (tbd) (VOSClim parameter) 005 - 360 deg. (offset = 0) HDT = (Integer value * 5) for Integer = 1 - 72 127 = not available = default
Pressure reduced to sea level	11	BUFR 010051 900 - 1100 hPa (offset = 900) Pressure = (Integer value / 10) + 900 for Integer = 0 - 2,000 2,047 = not available = default
3-hour pressure change (relative value)	10	BUFR 010061 -50 to +50 hPa (offset = -50) Tend. = (Integer value/10) - 50 for Integer = 0 - 1,000 1,023 = not available = default
Characteristic of pressure tendency	4	BUFR 010063 WMO BUFR table 010063 for pressure characteristic over last three hours, Codes 0 - 8 15 = not available = default
True wind direction (average over 10 minutes)	7	BUFR 011001 005 - 360 deg. (offset = 0) Direction = (Integer value * 5) for Integer = 1 - 72 0 = calm 127 = not available = default

Parameter	No. of bits	Description
True wind speed (average over 10 minutes)	8	BUFR 011002 0 - 127 m/s (offset = 0) Speed = (Integer value * 0.5) for Integer = 0 - 254 255 = not available = default
Relative wind direction (average over 10 minutes)	7	BUFR (tbd) (VOSClim parameter) 005 - 360 deg. (offset = 0) Direction = (Integer value * 5) for Integer = 1 - 72 0 = calm 127 = not available = default
Relative wind speed (average over 10 minutes)	8	BUFR (tbd) VOSClim parameter 0 - 127 m/s (offset = 0) Speed = (Integer value * 0.5) for Integer = 0 - 254 255 = not available = default
Maximum wind gust speed	8	BUFR 011041 0 - 127 m/s (offset = 0) Speed = (Integer value * 0.5) for Integer = 0 - 254 255 = not available = default
Maximum wind gust direction	7	BUFR 011043 005 - 360 deg. (offset = 0) Direction = (Integer value * 5) for Integer = 1 - 72 0 = calm 127 = not available = default
Air temperature (dry bulb)	10	BUFR 012101 223 - 323 K (offset = 223) (i.e. circa –50 to +50 °C) Temp. = (Integer value/10) + 223 for Integer = 0 – 1,000 1,023 = not available = default
Relative humidity	7	BUFR 013003 0 - 100 % (offset = 0) Rh = (Integer value) for Integer = 0 - 100 127 = not available = default
Sea surface temperature	9	BUFR 022042 268 to 318 K (offset = 268) (i.e. circa –5 to +45 °C) Sea Temp. = (Integer value/10) + 268 for Integer = 0 - 500 511 = not available = default
Horizontal visibility	6	BUFR 020001 0 to 50,000 m (offset = 0) Visibility = ([(Integer value)**2] * 13.073) for Integer = 0 - 62 63 = not available = default
Present weather	9	BUFR 020003 (WMO BUFR table 020003 for present weather, Codes 0 - 510) 511 = not available = default
Past weather 1	5	BUFR 020004 (WMO BUFR table 020004 for past weather, Codes 0 - 30) 31 = not available = default
Past weather 2	5	BUFR 020005 (WMO BUFR table 020005 for past weather, Codes 0 - 30) 31 = not available = default

Parameter	No. of bits	Description
Total cloud cover	4	BUFR 020010 0 to 100 % (offset = 0) Cover = (Integer value * 10) for Integer = 0 - 10 15 = not available = default
Cloud amount (low)	4	BUFR 020011 (WMO BUFR table 020011 for cloud amount, Codes 0 - 14) 15 = not available = default
Cloud type (low)	6	BUFR 020012 (WMO BUFR table 020012 for cloud type, Codes 0 - 62) 63 = not available = default
Cloud type (middle)	6	BUFR 020012 WMO BUFR table 020012 for cloud type, Codes 0 - 62 63 = not available = default
Cloud type (high)	6	BUFR 020012 (WMO BUFR table 020012 for cloud type, Codes 0 - 62) 63 = not available = default
Height of base of lowest cloud	7	BUFR 020013 0 - 2,500 m (offset = 0) Height = ([(Integer value)**2] * 0.16) for Integer = 0 - 125 126 = more than 2,500 m 127 = not available = default
Period of wind waves	5	BUFR 022012 0 - 30 s (offset = 0) Period = (Integer value) for Integer = 0 - 30 31 = not available = default
Height of wind waves	6	BUFR 022022 0 - 30 m (offset = 0) Height = (Integer value * 0.5) for Integer = 0 - 60 63 = not available = default
Direction of first swell (from which the swell is coming)	6	BUFR 022003 10 - 360 deg (offset 0). Direction = (Integer value * 10) for Integer = 1 - 36 0 = calm 63 = not available = default
Period of first swell	5	BUFR 022013 0 - 30 s (offset = 0) Period = (Integer value) for Integer = 0 - 30 31 = not available = default
Height of first swell	6	BUFR 022023 0 - 30 m (offset = 0) Height = (Integer value * 0.5) for Integer = 0 - 60 63 = not available = default
Direction of second swell (from which the swell is coming)	6	BUFR 022003 10 - 360 deg (offset 0). Direction = (Integer value * 10) for Integer = 1 - 36 0 = calm 63 = not available = default

Parameter	No. of bits	Description
Period of second Swell	5	BUFR 022013 0 - 30 s (offset = 0) Period = (Integer value) for Integer = 0 - 30 31 = not available = default
Height of second swell	6	BUFR 022023 0 - 30 m (offset = 0) Height = (Integer value * 0.5) for Integer = 0 - 60 63 = not available = default
Ice deposit (thickness)	7	BUFR 020031 0 - 126 cm (offset = 0) Thickness = (Integer value) for Integer = 0 - 126 127 = not available = default
Rate of ice accretion	3	BUFR 020032 (WMO BUFR table 020032 for rate of ice accretion, Codes 0 - 6) 7 = not available = default
Cause of ice accretion	3	BUFR 020033 (WMO BUFR table 020033 for cause of ice accretion, Codes 0 - 6) 7 = not available = default
Sea ice concentration	5	BUFR 020034 (WMO BUFR table 020034 for sea ice concentration, Codes 0 - 30) 31 = not available = default
Amount and type of ice	4	BUFR 020035 (WMO BUFR table 020035 for amount and type of ice, Codes 0 - 14) 15 = not available = default
Ice situation	5	BUFR 020036 (WMO BUFR table 020036 for ice situation, Codes 0 - 30) 31 = not available = default
Ice development	5	BUFR 020037 (WMO BUFR table 020037 for ice development, Codes 0 - 30) 31 = not available = default
Bearing of ice edge	4	BUFR 020038 045 - 360 deg. (offset = 0) Bearing = (Integer value * 45) for Integer = 1-8 15 = not available = default
Total	**360**	**Occupies 2 slots**

11 Area notice

11.1 This message provides dynamic information concerning a specified geographic area, polyline or positions. It should be only used to convey pertinent time-critical navigation safety information to mariners or authorities, and not as a means to convey information already provided by current official nautical charts or publications.

11.2 This message can also be used to convey advisory lines or tracks. However, the Route Information message should be used for recommended or directed routes.

11.3 The information is time-dependent (i.e. has start date and time and duration).

11.4 In order to allow advance notice, this message should be transmitted prior to the start date and time specified for the area. It should not be transmitted more than one day in advance.

11.5 This message should not be transmitted beyond the end date and time, except for a cancellation message. A cancellation message can be transmitted before the designated end date and time using the same Message Linkage ID with an Area Type of 126 (cancellation), a Duration = 0, and start date and time fields all set to not available.

11.6 ECDIS/ECS software should automatically remove the area notice from the display after the end date and time specified or after receiving a cancellation message.

11.7 Up to 5-slots message can be created, however messages with more than 3 slots should be avoided. Messages with more than 3 slots are less likely to be received due to radiofrequency noise or packet collision.

11.8 Waypoints can be specified using the polyline/waypoint sub-area. In case more precision is to be required then multiple circle/point sub-areas can be defined (e.g., one for each waypoint).

11.9 When waypoints are specified using polyline or circle/point sub-areas, they should be numbered and used in the order that they appear in the message.

11.10 Polyline/polygon sub-areas must follow immediately after a point sub-area (Area Shape 0) in the same Area Notice message. The point defines the start of the line segments. If more than 5 points were required for a polyline/polygon, then additional polyline/polygon sub-areas could be used. However, they must follow immediately after the first polyline/polygon sub-area.

11.11 The Message Linkage ID can be used to link additional text (e.g., a separate text message). However, both the Area Notice and additional Text Description message should be sent by the same source MMSI.

11.12 The total area defined by one Area Notice (one Message Linkage ID) is the union of all of the sub-areas contained in the message.

11.13 If the same Message Linkage ID is retransmitted with different sub-areas and/or times, then the ECDIS/ECS should replace the old Area with the new.

11.14 The Message Linkage ID must be unique across all binary messages to which it applies. In this way, the Message Linkage ID and Source MMSI are connected to the same text message.

Table 11.1
Area notice – (broadcast)

			Parameter	No. of bits	Description
Standard Message Header			Message ID	6	Identifier for Message 8; always 8.
			Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated (see ITU-R M.1371-3, Annex 2, § 4.6.1). 0 - 3 0 = default 3 = do not repeat anymore
			Source MMSI	30	MMSI number of source station.
			Spare	2	Not used. Set to zero.
Binary Data			Designated Area Code	10	DAC = 001
			Function Identifier	6	**FI = 22**
	Application Data		Message Linkage ID	10	A source specific running number, unique across all binary messages equipped with Message Linkage ID. Used to link additional information to the message by a Text Description message. The Message Linkage ID and the first six digits of the source MMSI uniquely identify the sent message. 1 - 1,023 0 = not available = default
			Notice Description	7	Notice description as defined in Table 11.11 Set to 0 - 127 according to description. If = 127 there must be associated text (see Table 11.10)
		Start date and time of Area	UTC Month	4	Start UTC month of the Area notice. 1 - 12 0 = not available = default 13 - 15 (reserved for future use)
			UTC Day	5	Start UTC day of the Area notice. 1 - 31 0 = not available = default
			UTC Hour	5	Start UTC hour of the Area notice. 0 - 23 24 = not available = default 25 - 31 (reserved for future use)
			UTC Minute	6	Start UTC minute of the Area notice. 0 - 59 60 = not available = default 61 - 63 (reserved for future use)
			Duration	18	Minutes until the end of Area notice, measured from start date and time of Area Notice. 0 = cancel Area Notice 262,143 = undefined = default Maximum duration is 262,142 minutes (182.04 days)

	Parameter		No. of bits	Description
		Sub-areas	max 870	From 1 to 10 sub-areas, each structured as in Tables 11.4 - 11.9. A short text description may be associated with the areas using Sub-area 5: Associated text (see Table 11.10). Total number of sub-areas is determined by the length of the message. Each sub-area is a fixed 87 bits.
Total			**max 981**	**Occupies 2 - 5 slots (see Table 11.3)**

Table 11.2
Area notice – (addressed)

	Parameter		No. of bits	Description
Standard Message Header	Message ID		6	Set to 6 (addressed, acknowledgement required).
	Repeat Indicator		2	Used by the repeater to indicate how many times a message has been repeated. See ITU-R M.1371-3, Annex 2, § 4.6.1. 0 - 3 0 = default 3 = do not repeat anymore
	Source MMSI		30	MMSI number of source station.
	Sequence number		2	Refer to ITU-R M.1371-3, Annex 2, § 5.3.1 0 - 3
	Destination MMSI		30	MMSI number of destination station.
	Retransmit Flag		1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted
	Spare		1	Not used. Set to zero.
Binary Data	Designated Area Code		10	DAC = 001
	Function Identifier		6	**FI = 23**
	Application Data	Message Linkage ID	10	Binary identifier for the defined area. This number uniquely identifies an Area and is used to link additional information with the Area. Source MMSI and this ID uniquely identify the zone. The number is unique across all binary messages to which Message Linkage ID applies. Set to 0 - 1,023 by message originator.
		Notice Description	7	Notice Description as defined in Table 11.11. Set to 0 - 127 according to description. If = 127 there must be associated text (Table 11.10)

		Parameter	No. of bits	Description
	Start date and time of Area	UTC Month	4	Start UTC month of the Area notice. 1 - 12 0 = not available = default 13 - 15 (reserved for future use)
		UTC Day	5	Start UTC day of the Area notice. 1 - 31 0 = not available = default
		UTC Hour	5	Start UTC hour of the Area notice. 0 - 23 24 = not available = default 25 - 31 (reserved for future use)
		UTC Minute	6	Start UTC minute of the Area notice. 0 - 59 60 = not available = default 61 - 63 (reserved for future use)
	Duration		18	Minutes until end of Area notice. Measured from start date and time of Area Notice. 0 = cancel Area Notice 262,143 = undefined = default Maximum duration is 262,142 minutes (182.04 days).
	Sub-areas		max 870	From 1 to 10 sub-areas, each structured as in Tables 11.4 - 11.9. A short text description may be associated with the areas using Sub-area 5: Associated text (see Table 11.10). Total number of sub-areas is determined by the length of the message. Each sub-area is a fixed 87 bits.
Total			**max 1,013**	**Occupies 2 - 5 slots (see Table 11.3)**

Table 11.3
Number of slots

Number of sub-areas transmitted	1	2	3	4	5	6	7	8	9	10
Number of bits used for a broadcast message	198	285	372	459	546	633	720	807	894	981
Number of slots used for a broadcast message	2	2	3	3	3	4	4	4	5	5
Number of bits used for an addresses message	230	317	404	491	578	665	752	839	926	1013
Number of slots used for an addressed message	2	2	3	3	3	4	4	5	5	5

Table 11.4
Sub-area table

Number	Area Shape	Table for Definition
0	circle or point	11.5
1	rectangle	11.6
2	sector	11.7
3	polyline	11.8
4	polygon	11.9
5	associated text	11.10
6 - 7	reserved	--

Table 11.5
Circle or point

	Parameter	No. of bits	Description
Area Notice: Sub-area	Area Shape	3	Defines the shape of the area. Set 0 for Circle.
	Scale Factor	2	Scale factor. This is a multiplier for the dimensions of the shape. 1 (default), 10, 100, & 1,000 (scale factor = 10^n where n=decimal value of scale factor).
	Longitude	25	Longitude of the centre in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
	Latitude	24	Latitude of the centre in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
	Precision	3	Precision of data in latitude and longitude parameters. Data to be truncated to the number of decimal places specified in this parameter. 0 - 4 4 = default
	Radius	12	Defines the size of the circular area. This is the radius of the circle in metre steps. 0 = point (default) 1 - 4,095 metres This is multiplied by the scale factor to give a maximum size of 4,095,000 metres (4,095 km).
	Spare	18	Not used. Set to zero.

Table 11.6
Rectangle

	Parameter	No. of bits	Description
Area Notice: Sub-area	Area Shape	3	Defines the shape of the area. Set 1 for Rectangle.
	Scale Factor	2	Scale factor. This is a multiplier for the dimensions of the shape. 1 (default), 10, 100, & 1,000 (scale factor = 10^n where n=decimal value of scale factor).
	Longitude	25	Longitude of the SW corner in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
	Latitude	24	Latitude of the SW corner in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
	Precision	3	Precision of data in latitude and longitude parameters. Data to be truncated to the number of decimal places specified in this parameter. 0 - 4 4 = default
	E dimension	8	Box dimension East from the corner point, in metre steps. This is multiplied by the scale factor to give a maximum dimension of 255,000 metres (255 km). 0 = line North-South (default) 1 - 255 * scale factor metres.
	N dimension	8	Box dimension North from the corner point, in metre steps. This is multiplied by the scale factor to give a maximum dimension of 255,000 m (255 km). 0 = line East-West (default) 1 - 255 * 10^scalefactor metres
	Orientation	9	Rotation of area, in degree steps. Area is rotated clockwise this number of degrees about the position above. 0 = no rotation = default 1 - 359 = rotation in degrees 360 - 511 (reserved for future use)
	Spare	5	Not used Set to zero.

Figure 11-1
Description of the process required to define a "rectangle" area

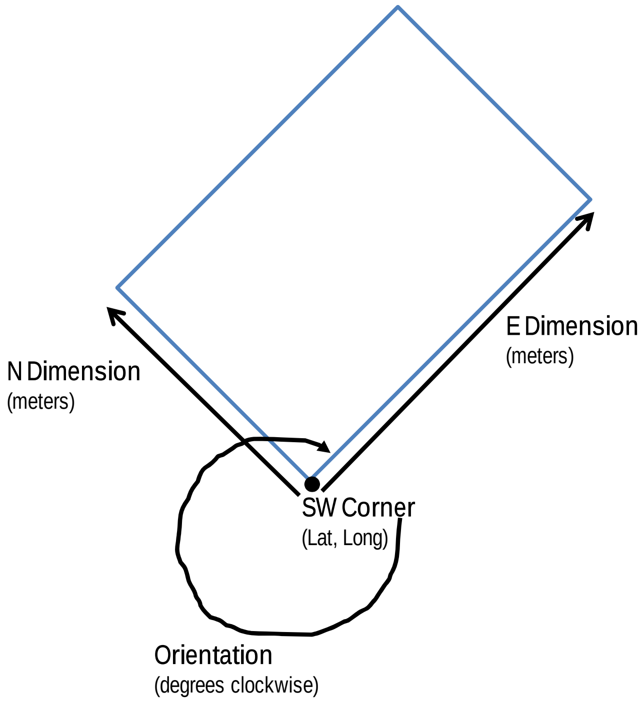
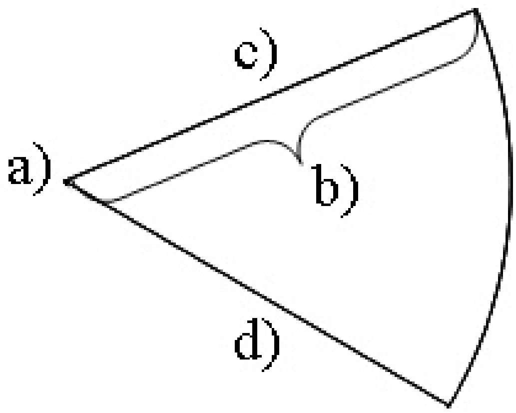


Table 11.7
Sector

	Parameter	No. of bits	Description
Area Notice: Sub-area	Area Shape	3	Defines the shape of the area. Set 2 for Sector.
	Scale Factor	2	Scale factor. This is a multiplier for the dimensions of the shape. 1 (default), 10, 100, & 1,000 (scale factor = 10^n where n=decimal value of scale factor)
	Longitude	25	Longitude of the centre in 1/1,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
	Latitude	24	Latitude of the centre in 1/1,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
	Precision	3	Precision of data in latitude and longitude parameters. Data to be truncated to the number of decimal places specified in this parameter. 0 - 4 4 = default
	Radius	12	Defines the size of the sector, in metre steps. This is multiplied by the scale factor to give a maximum size of 4,095,000 m (4,095 km). 0 = point = default 1 - 4,095 metres

	Parameter	No. of bits	Description
	Left Boundary	9	Orientation of the left boundary edge of the sector, in degree steps measured clockwise from true North about the centre point. 0 = no rotation= default 1 - 359 = rotation in degrees 360 - 511 (reserved for future use)
	Right Boundary	9	Orientation of the right boundary edge of the sector, in degree steps measured clockwise from true North about the centre point. The total sector area is the area measured from the left boundary clockwise to the right boundary. 0 = no rotation= default 1 - 359 = rotation in degrees 360 - 511 (reserved for future use)
	Spare	0	Not used. Set to zero.

Figure 11-2
Sector Area



a) Centre point
b) Sector radius
c) Sector bearings from centre point, left boundary
d) Sector bearings from centre point, right boundary

Table 11.8
Waypoint/polyline points

	Parameter	No. of bits	Description
Area Notice: Sub-area	Area Shape	3	Defines the shape of the area. Set to 3 for Polyline (open area or line). The initial point (point 0) is defined by an Area Shape = 0 (circle)
	Scale Factor	2	Scale factor. This is a multiplier for the dimensions of the shape. 1 (default), 10, 100, & 1,000 (scale factor = 10^n where n=decimal value of scale factor)

	Parameter	No. of bits	Description
	Point 1 Angle	10	True bearing, in half-degree steps, from Point 0 to Point 1 or from the last Point in a Polyline directly preceding this Polyline. Degrees bearing = decimal value (0-719)*.5 720 = not available = default 721 - 1,023 (reserved for future use)
	Point 1 Distance	10	Distance, in metre steps, from Point 0 to Point 1 or from the last Point in a Polyline directly preceding this Polyline. This number (1 - 1,023) is multiplied by the scale factor to give a maximum of 1,023,000 metres (1,023 km). 0 = default (no point).
	Point 2 Angle	10	True bearing, in half-degree steps, from Point 1 to Point 2. Degrees bearing = decimal value (0 - 719)*.5 720 = not available (no point) = default 721 - 1,023 (reserved for future use)
	Point 2 Distance	10	Distance, in metre steps, from Point 1 to Point 2. This number (1 - 1,023) is multiplied by the scale factor to give a maximum of 1,023,000 metres (1,023 km). 0 = default (no point).
	Point 3 Angle	10	True bearing, in half-degree steps, from Point 2 to Point 3. Degrees bearing = decimal value (0-719)*.5 720 = not available (no point) = default 721 - 1,023 (reserved for future use)
	Point 3 Distance	10	Distance, in metre steps, from Point 2 to Point 3. This number (1 - 1,023) is multiplied by the scale factor to give a maximum of 1,023,000 metres (1,023km). 0 = default (no point).
	Point 4 Angle	10	True bearing, in half-degree steps, from Point 3 to Point 4. Degrees bearing = decimal value (0 - 719)*.5 720 = not available (no point) = default 721 - 1,023 (reserved for future use)
	Point 4 Distance	10	Distance, in metre steps, from Point 3 to Point 4. This number (1 - 1,023) is multiplied by the scale factor to give a maximum of 1,023,000 metres (1,023 km). 0 = default (no point).
	Spare	2	Not used. Set to zero.

Figure 11-3
Graphic description of a waypoint/polyline, showing angle and distance between points
(if one side of a polyline is to be a boundary (e.g., edge of ice area), this is defined by the left side of the line in order of sequence from the initial sub-area point (Point 0))

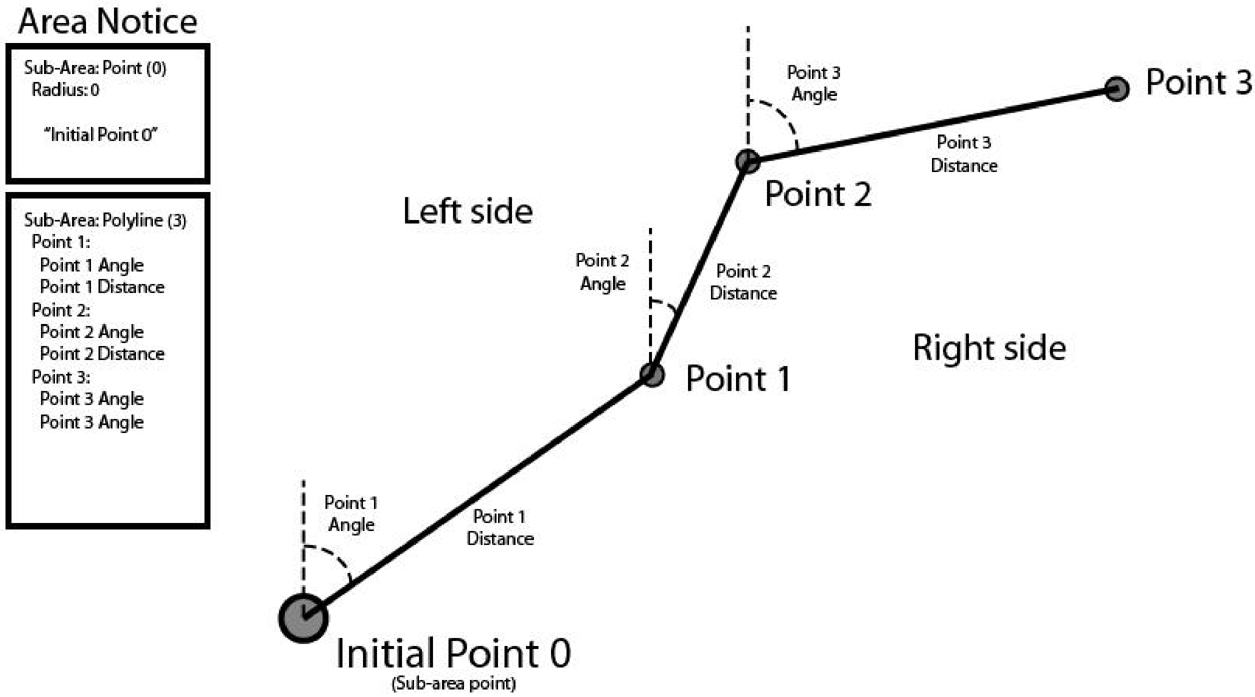


Figure 11-4
Graphic depiction of:
1) ice boundary between sea ice and open water, and
2) recommended route through the sea ice area

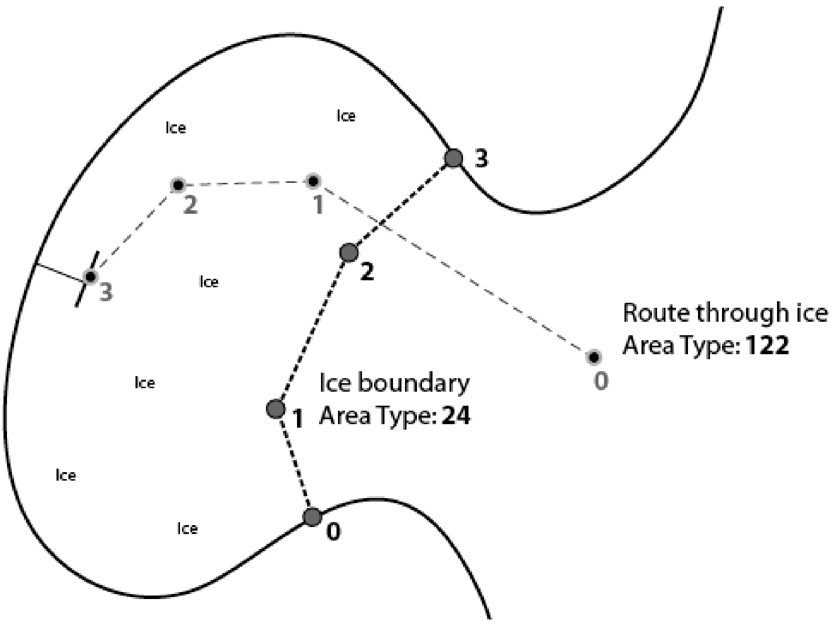


Figure 11-5
Graphic depiction of a storm front message

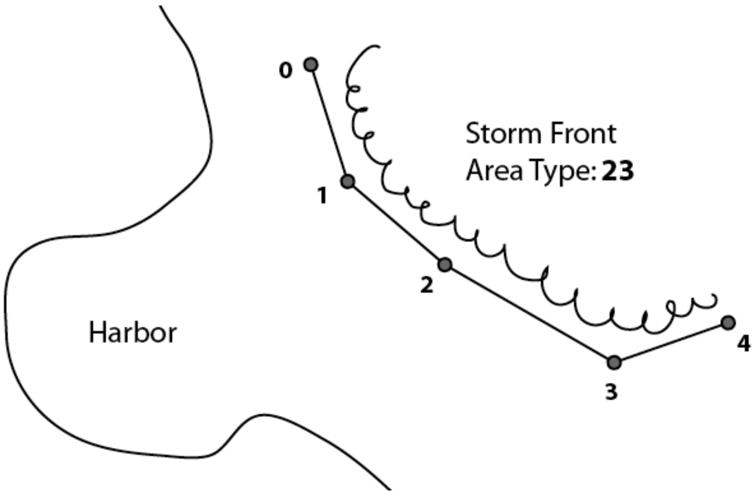


Table 11.9
Polygon

	Parameter	No. of bits	Description
Area Notice: Sub-area	Area Shape	3	Defines the shape of the area. Set to 4 for Polygon (closed area). The polygon shape is closed by connecting the last defined point back to the initial point (Point 0). To be preceded by an Area Shape = 0 (circle)
	Scale Factor	2	This is a multiplier for the dimensions of the shape. 1 (default), 10, 100, & 1,000 (scale factor = 10^n where n=decimal value of scale factor)
	Point 1 Angle	10	True bearing in half-degree steps, from Point 0 to Point 1 or from the last Point in a Polygon directly preceding this Polygon. Degrees bearing = decimal value (0 - 719)*.5 720 = not available = default 721 - 1,023 (not for use)
	Point 1 Distance	10	Distance in metre steps, from Point 0 to Point 1 or from the last Point in a Polygon directly preceding this Polygon. This number (1 - 1,023) is multiplied by the scale factor to give a maximum of 1,023,000 metres (1,023 km).
	Point 2 Angle	10	True bearing in half-degree steps, from Point 1 to Point 2. Degrees bearing = decimal value (0 - 719)*.5 720 = not available (no point) = default 721 - 1,023 (not for use)
	Point 2 Distance	10	Distance in metre steps, from Point 1 to Point 2. This number (1 - 1,023) is multiplied by the scale factor to give a maximum of 1,023,000 metres (1,023 km). 0 = default (no point).
	Point 3 Angle	10	True bearing in half-degree steps, from Point 2 to Point 3. Degrees bearing = decimal value (0-719)*.5 720 = not available (no point) = default 721 - 1023 (reserved for future use)

	Parameter	No. of bits	Description
	Point 3 Distance	10	Distance in metre steps, from Point 2 to Point 3. This number (1 - 1,023) is combined with the scale factor to give a maximum of 1,023,000 metres (1,023 km). 0 = default (no point).
	Point 4 Angle	10	True bearing in half-degree steps, from Point 3 to Point 4. Degrees bearing = decimal value (0-719)*.5 720 = not available (no point) = default 721 - 1,023 (not for use)
	Point 4 Distance	10	Distance in metre steps, from Point 3 to Point 4. This number (1 - 1,023) is multiplied by the scale factor to give a maximum of 1,023,000 metres (1,023 km). 0 = default (no point).
	Spare	2	Not used. Set to zero.

Table 11.10
Associated text

	Parameter	No. of bits	Description
Area Notice Sub-area	Area Shape	3	Defines the shape of the area. Set 5 for Associated text. This text is associated with the area defined in this binary message. Multiple Associated text sub-areas are glued together in the order they appear in the message.
	Text	84	14 characters 6-bits ASCII characters, as defined in ITU-R M. 1371-3, Table 44. If less than 14 characters are required, then the remainder of the field should be filled with "@" characters.
	Spare	0	Not used. Set to zero.

Table 11.11
Notice Description

0	Caution Area: Marine mammals habitat	**32**	Restricted Area: Fishing prohibited	**64**	Distress Area: Vessel disabled and adrift	**96**	Chart Feature: Sunken vessel
1	Caution Area: Marine mammals in area – reduce speed	**33**	Restricted Area: No anchoring.	**65**	Distress Area: Vessel sinking	**97**	Chart Feature: Submerged object
2	Caution Area: Marine mammals in area – stay clear	**34**	Restricted Area: Entry approval required prior to transit	**66**	Distress Area: Vessel abandoning ship	**98**	Chart Feature: Semi-submerged object
3	Caution Area: Marine mammals in area – report sightings	**35**	Restricted Area: Entry prohibited	**67**	Distress Area: Vessel requests medical assistance	**99**	Chart Feature: Shoal area
4	Caution Area: Protected habitat – reduce speed	**36**	Restricted Area: Active military OPAREA	**68**	Distress Area: Vessel flooding	**100**	Chart Feature: Shoal area due north
5	Caution Area: Protected habitat – stay clear	**37**	Restricted Area: Firing – danger area.	**69**	Distress Area: Vessel fire/explosion	**101**	Chart Feature: Shoal area due east
6	Caution Area: Protected habitat – no fishing or anchoring	**38**	Restricted Area: Drifting Mines	**70**	Distress Area: Vessel grounding	**102**	Chart Feature: Shoal area due south
7	Caution Area: Derelicts (drifting objects)	**39**	(reserved for future use)	**71**	Distress Area: Vessel collision	**103**	Chart Feature: Shoal area due west
8	Caution Area: Traffic congestion	**40**	Anchorage Area: Anchorage open	**72**	Distress Area: Vessel listing/capsizing	**104**	Chart Feature: Channel obstruction
9	Caution Area: Marine event	**41**	Anchorage Area: Anchorage closed	**73**	Distress Area: Vessel under assault	**105**	Chart Feature: Reduced vertical clearance
10	Caution Area: Divers down	**42**	Anchorage Area: Anchoring prohibited	**74**	Distress Area: Person overboard	**106**	Chart Feature: Bridge closed
11	Caution Area: Swim area	**43**	Anchorage Area: Deep draft anchorage	**75**	Distress Area: SAR area	**107**	Chart Feature: Bridge partially open
12	Caution Area: Dredge operations	**44**	Anchorage Area: Shallow draft anchorage	**76**	Distress Area: Pollution response area	**108**	Chart Feature: Bridge fully open
13	Caution Area: Survey operations	**45**	Anchorage Area: Vessel transfer operations	**77**	(reserved for future use)	**109**	(reserved for future use)

14	Caution Area: Underwater operation	**46**	(reserved for future use)	**78**	(reserved for future use)	**110**	(reserved for future use)
15	Caution Area: Seaplane operations	**47**	(reserved for future use)	**79**	(reserved for future use)	**111**	(reserved for future use)
16	Caution Area: Fishery – nets in water	**48**	(reserved for future use)	**80**	Instruction: Contact VTS at this point/juncture	**112**	Report from ship: Icing info
17	Caution Area: Cluster of fishing vessels	**49**	(reserved for future use)	**81**	Instruction: Contact Port Administration at this point/juncture	**113**	(reserved for future use)
18	Caution Area: Fairway closed	**50**	(reserved for future use)	**82**	Instruction: Do not proceed beyond this point/juncture	**114**	Report from ship: Miscellaneous information – define in Associated text field
19	Caution Area: Harbour closed	**51**	(reserved for future use)	**83**	Instruction: Await instructions prior to proceeding beyond this point/juncture	**115**	(reserved for future use)
20	Caution Area: Risk (define in Associated text field)	**52**	(reserved for future use)	**84**	Proceed to this location – await instructions	**116**	(reserved for future use)
21	Caution Area: Underwater vehicle operation	**53**	(reserved for future use)	**85**	Clearance granted – proceed to berth	**117**	(reserved for future use)
22	(reserved for future use)	**54**	(reserved for future use)	**86**	(reserved for future use)	**118**	(reserved for future use)
23	Environmental Caution Area: Storm front (line squall)	**55**	(reserved for future use)	**87**	(reserved for future use)	**119**	(reserved for future use)
24	Environmental Caution Area: Hazardous sea ice	**56**	Security Alert – Level 1	**88**	Information: Pilot boarding position	**120**	Route: Recommended route
25	Environmental Caution Area: Storm warning (storm cell or line of storms)	**57**	Security Alert – Level 2	**89**	Information: Icebreaker waiting area	**121**	Route: Alternative route
26	Environmental Caution Area: High wind	**58**	Security Alert – Level 3	**90**	Information: Places of refuge	**122**	Route: Recommended route through ice
27	Environmental Caution Area: High waves	**59**	(reserved for future use)	**91**	Information: Position of icebreakers	**123**	(reserved for future use)

28	Environmental Caution Area: Restricted visibility (fog, rain, etc.)	**60**	(reserved for future use)	**92**	Information: Location of response units	**124**	(reserved for future use)
29	Environmental Caution Area: Strong currents	**61**	(reserved for future use)	**93**	VTS active target	**125**	Other – Define in associated text field
30	Environmental Caution Area: Heavy icing	**62**	(reserved for future use)	**94**	Rouge or suspicious vessel	**126**	Cancellation – cancel area as identified by Message Linkage ID
31	(reserved for future use)	**63**	(reserved for future use)	**95**	Vessel requesting non-distress assistance	**127**	Undefined (default)

12 Environmental

12.1 This message provides environmental information from 1 to 8 sensor reports (e.g., 1 sensor report uses 2 slots while a message with 8 sensor reports can use up to 5 slots). Each sensor report carries the dynamic or static information relating to a specific sensor.

12.2 Each Environmental Message has 56 bits of standard header, with 12 bits available for payload. Each sensor report has 27 bits of common data leaving 85 bits for sensor data. Table 12.3 provides the framework for the sensor report.

12.2.1 Table 12.4 outlines a variety of sensor types that can be transmitted using this message.

12.2.2 The sensor data is defined in accordance to the sensor type. Tables 12.5 to 12.15 provide details for the 85 bits of information for each sensor report type. In each case "Sensor not available" means that the specific reading is not ever possible from that sensor location and "Data not available" means that the reading is possible but is not available for the current report (i.e. the sensor could be malfunctioning).

Table 12.1
Environmental

Parameter		No. of bits	Description
Standard Message Header	Message ID	6	Identifier for Message 8; Set to 8 (broadcast, no acknowledgement).
	Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated (see ITU-R M.1317, Annex 2, § 4.6.1). 0 - 3 0 = default 3 = do not repeat any more Set to 0 (default).
	Source MMSI	30	MMSI number of source station. Varies according to the transmitter ID.
	Spare	2	Not used. Set to zero.
Binary Data	Designated Area Code	10	DAC = 001
	Function Identifier	6	**FI = 26**
	Application Data	Max 952	From 1 to 8 sensor reports, each structured as in Table 12.3. The total number of reports is determined by the receiver based on the length of the data.
Total		**max 1,008**	**Occupies 2 - 5 slots.** (see Table 12.2)

Table 12.2
Number of slots

Number of bits used	168	280	392	504	616	728	840	952
Number of slots required (168 bits in first 210 in 2-5)	1	2 (max 378)	3 (max 588)	3	4 (max 798)	4	5 (max 1,008)	5

Table 12.3
Environmental message – Sensor report framework

Parameter	No of bits	Description
Report Type	4	Environmental Report Type as defined in Table 12.4
Time Stamp		UTC date and time.
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default
Site ID	7	Binary identifier of sensor site, combined with transmitter MMSI to fully identify sensor site (i.e. there can be more than one physical sensors, each one reporting different data types at a sensor site)
Sensor Data	85	Sensor data according to the sensor type (see Tables 12.5 - 12.15)
Total	**112**	

Table 12.4
Environmental Message Sensor Report Types

Value	Description
0	Site Location
1	Station ID
2	Wind
3	Water level
4	Current Flow (2D)
5	Current Flow (3D)
6	Horizontal Current Flow
7	Sea State
8	Salinity
9	Weather
10	Air gap/Air draft
11-15	(reserved for future use)

Table 12.5
Site location report

Parameter	No. of bits	Description
Longitude	28	Longitude in 1/10,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
Latitude	27	Latitude in 1/10,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default
Altitude	11	Altitude of the sensor relative to MSL, in 0.1 metre steps. 0.0 - 200.0 metres 2,001 = altitude 200.1 metres or greater 2,002 = not available = default 2,003 - 2,046 (reserved for future use)
Sensor Owner	4	Owner of the sensor/responsible for the sensor data. 0 = unknown = default 1 = hydrographic office 2 = inland waterway authority 3 = coastal directorate 4 = meteorological service 5 = port authority 6 = coast guard 7 - 13 (reserved for future use) 14 (reserved for regional use)
Data Timeout	3	Length of time that data is valid (i.e. should not be used after time-out period). 0 = no time-out period = default 1 = 10 min 2 = 1 hr 3 = 6 hrs 4 = 12 hrs 5 = 24 hrs 6 - 7 (reserved for future use)
Spare	12	Not used. Set to zero
Total	**85**	

Table 12.6
Station ID Report

Parameter	No. of bits	Description
Name	84	Agency reference number. Fourteen characters 6-bits ASCII as defined in ITU-R M.1371-3, Table 44.
Spare	1	Not used. Set to zero.
Total	**85**	

Table 12.7
Wind Report

Parameter	No. of bits	Description
Average Wind Speed	7	Average of wind speed values over the last 10 minutes, in 1 knot steps. 0 - 120 knots 121 = wind 121 knots greater 122 = not available = default 123 - 126 (reserved for future use)
Wind Gust	7	Max wind speed reading during the last 10 minutes, in 1 knot steps. 0 - 120 knots 121 = wind 121 knots or greater 122 = not available = default 123 - 126 (reserved for future use)
Wind Direction	9	Direction of the average wind over the last 10 minutes, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (not for use)
Wind Gust Direction	9	Direction of the maximum wind over the last 10 minutes, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (not for use)
Sensor Data Description	3	Type of data from Wind sensor, as defined in Table 12.16.
Forecast Wind Speed	7	Predicted average wind speed, in 1 knot steps. 0 - 120 knots 121 = wind 121 knots or greater 122 = not available = default 123 - 126 (reserved for future use)
Forecast Wind Gust	7	Predicted maximum wind speed, in 1 knot steps. 0 - 120 knots 121 = wind 121 knots or greater 122 = not available = default 123 - 126 (reserved for future use)

Parameter	No. of bits	Description
Forecast Wind Direction	9	Predicted direction of the average wind, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (not for use)
Valid Time of Forecast		Valid UTC date and time of forecast.
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default
Duration	8	Duration of the validity of the forecast from the time of the forecast, in 1 minute steps. 1 - 255 minutes 0 = cancel forecast = default
Spare	3	Not used. Set to zero.
Total	**85**	

Table 12.8
Water level report

Parameter	No. of bits	Description
Water Level Type	1	Type of water level. 0 = relative to reference datum 1 = water depth
Water Level	16	Water level, in 0.1 metre steps (as per 2's complement). -327.67 to +327.67 metres -32767 = -327.67 metres or less +32767 = +327.67 metres or greater -32768 = not available = default
Water Level Trend	2	0 = increasing 1 = decreasing 2 = steady 3 = not available = default

Parameter	No. of bits	Description
Vertical Reference Datum	5	Type of datum used. 0 = Mean Lower Low Water (MLLW) 1 = International Great Lakes Datum (IGLD-85) 2 = Local river datum 3 = Station Datum (STND) 4 = Mean Higher High Water (MHHW) 5 = Mean High Water (MHW) 6 = Mean Sea Level (MSL) 7 = Mean Low Water (MLW) 8 = National Geodetic Vertical Datum (NGVD-29) 9 = North American Vertical Datum (NAVD-88) 10 = World Geodetic System (WGS-84) 11 = Lowest Astronomical Tide (LAT) 12 = pool 13 = gauge 14 = unknown/not available = default 15 - 30 (reserved for future use)
Sensor Data Description	3	Type of data from Water Level sensor, as defined in Table 12.16.
Forecast Water Level Type	1	Type of water level for forecast 0 = relative to reference datum 1 = water depth
Forecast Water Level	16	Forecast water level, in 0.1 metre steps (as per 2's complement). -327.67 to +327.67 metres -32767 = -327.67 metres or less +32767 = +327.67 metres or greater -32768 = not available = default
Valid Time of Forecast		Valid UTC date and time of Forecast.
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default
Duration	8	Duration of the validity of the forecast from the time of the forecast, in 1 minute steps. 1 - 255 minutes 0 = cancel forecast = default
Spare	17	Not used. Set to zero.
Total	**85**	

Table 12.9
Current Flow Report: two-dimensions (x & y)

Parameter	No. of bits	Description
Current Speed 1	8	Speed of Current 1 measured at a chosen level below the sea surface, in 0.1 knot steps. 0.0 - 24.5 knots 246 = speed 24.6 knots or greater 247 = data not available = default 248 - 255 (reserved for future use)
Current Direction 1	9	Direction of Current 1, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Current Measuring level 1	9	Measurement level of Current 1 below sea surface, in 1 metre steps. 0 – 360 metres 361 = 361 m or greater 362 = not available = default 363 - 511 (reserved for future use)
Current Speed 2	8	Speed of Current 2 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as Current Speed 1)
Current Direction 2	9	Direction of Current 2, in 1 degree steps. (Same as Current Direction 1)
Current Measuring level 2	9	Measurement level of Current 2 below sea surface, in 1 metre steps. (Same as Current Measuring level 1)
Current Speed 3	8	Speed of Current 3 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as Current Speed 1)
Current Direction 3	9	Direction of Current 3, in 1 degree steps. (Same as Current Direction 1)
Current Measuring level 3	9	Measurement level of Current 3 below sea surface, in 1 metre steps. (Same as Current Measuring level 1)
Sensor Data Description	3	Type of data from current sensor, as defined in Table 12.16.
Spare	4	Not used. Set to zero.
Total	**85**	

Table 12.10
Current flow Report: 3-dimensions (x, y & z)

Parameter	No. of bits	Description
Current Vector Component North (u) 1	8	Speed of North component of Current 1 measured at a chosen level below the sea surface, in 0.1 knot steps. 0.0 - 24.5 knots 246 = speed 24.6 knots or greater 247 = not available = default 248 - 254 (reserved for future use)
Current Vector Component East (v) 1	8	Speed of East component of Current 1 measured at a chosen level below the sea surface, in 0.1 knot steps. 0.0 - 24.5 knots 246 = speed 24.6 knots or greater 247 = not available = default 248 - 254 (reserved for future use)
Current Vector Component Up (z) 1	8	Speed of Up component of Current 1 measured at a chosen level below the sea surface, in 0.1 knot steps. 0.0 - 24.5 knots 246 = speed 24.6 knots or greater 247 = not available = default 248 - 254 (reserved for future use)
Current Measuring level 1	9	Measurement level of Current 1 below sea surface, in 1 metre steps. 0 - 360 metres 361 = not available = default 362 - 511 (reserved for future use)
Current Vector Component North (u) 2	8	Speed of North component of Current 2 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as for Current 1)
Current Vector Component East (v) 2	8	Speed of East component of Current 2 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as for Current 1)
Current Vector Component Up (z) 2	8	Speed of Up component of Current 2 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as for Current 1)
Current Measuring level 2	9	Measurement level of Current 2 below sea surface, in 1 metre steps. (Same as for Current 1)
Sensor Data Description	3	Type of data from Current sensor, as defined in Table 12.16.
Spare	16	Not used. Set to zero.
Total	**85**	

Table 12.11
Horizontal current flow report

Parameter	No. of bits	Description
Current Reading 1 Bearing	9	Bearing of Current 1 reading from sensor position, in 1 degree steps. 0 - 359 degrees 360 = data not available = default 361 = sensor not available 362 - 511 (reserved for future use)
Current Reading 1 Distance	7	Distance of Current 1 reading from sensor position, in 1 metre steps. 0 - 120 metres 121 = 121 m or greater 122 = not available = default 123 - 127 (reserved for future use)
Current 1 Speed	8	Speed of Current 1 measured at a chosen level below the sea surface, in 0.1 knot steps. 0.0 - 24.5 knots 246 = speed 24.6 knots or greater 247 = not available = default 248 - 255 (reserved for future use)
Current 1 Direction	9	Direction of Current 1, in 1 degree steps. 0 - 359 degrees 360 = data not available = default 361 - 511 (not for use)
Current 1 Measuring level	9	Measurement level of Current 1 below sea surface, in 1 metre steps. 0 - 360 metres 361 = level 361 metres or greater 362 = data not available = default 363 - 511 (reserved for future use)
Current Reading 2 Bearing	9	Bearing of Current 2 reading from sensor position, 1 degree steps. (Same as for Current 1 bearing)
Current Reading 2 Distance	7	Distance of Current 2 reading from sensor position, 1 metre steps. (Same as for Current 1 Distance)
Current 2 Speed	8	Speed of Current 2 measured at a chosen level below the sea surface, in 0.1 knot steps. (Same as for Current 1 Speed)
Current 2 Direction	9	Direction of Current 2, in 1 degree steps. (Same as for Current 1 Direction)
Current 2 Measuring level	9	Measurement level of Current 1 below sea surface, in 1 metre steps. (Same as for Current 1 level)
Spare	1	Not used. Set to zero.
Total	**85**	

Table 12.12
Sea state report

Parameter	No. of bits	Description
Swell Height	8	Height of the swell, in 0.1 metre steps. 0.0 – 24.5 metres 246 = height 24.6 metres or greater 247 = not available = default 248 - 255 (reserved for future use)
Swell Period	6	Swell period in seconds, in 1 second steps. 0 - 60 seconds 61 = not available = default 62 - 63 (reserved for future use)
Swell Direction	9	Direction of swells, in 1 degree steps. 0 – 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Sea State	4	Beaufort Scale, as defined in Table 1.2
Sensor Data Description	3	Type of data from Swell sensor, as defined in Table 12.16
Water Temperature	10	Temperature of the water in degrees Celsius (as per 2's complement), in 0.1 degree steps. -10.0 to + 50.0 degrees Celsius temp = decimal value/10 - 10 for decimal = 0 - 600 601 = not available = default 602 - 1,023 (reserved for future use)
Water Temperature Depth	7	Depth of water temperature sensor, in 0.1 metre steps. 0 - 12.0 metres 121 = depth 12.1 metres or greater 122 = not available = default 123 - 126 (reserved for future use)
Sensor Data Description	3	Type of data from Water Temperature sensor, as defined in Table 12.16.
Significant Wave Height	8	Height of the waves, in 0.1 metre steps. 0.0 - 24.5 metres 246 = height 24.6 m or greater 247 = not available = default 248 - 255 (reserved for future use)
Wave Period	6	Wave period, in 1 second steps. 0 - 60 seconds 61 = not available = default 62- 63 (reserved for future use)
Wave Direction	9	Direction of waves, in 1 degree steps. 0 - 359 degrees 360 = not available = default 361 - 511 (reserved for future use)
Sensor Data Description	3	Type of data from Wave sensor, as defined in Table 12.16.

Parameter	No. of bits	Description
Salinity	9	Salinity in 0.1‰ (ppt) steps. 0.0 - 50.0‰ 501 = salinity 50.1‰ or greater 502 = data not available = default 503 = sensor not available 504 - 511 (reserved for future use)
Total	**85**	

Table 12.13
Salinity report

Parameter	No. of bits	Description
Water Temperature	10	Temperature of water in degrees Celsius, in 0.1 degree steps. -10.0 to + 50.0 degrees temp = decimal value/10 - 10 for decimal = 0 - 600 601 = data not available 602 = sensor not available = default 603 - 1,023 (reserved for future use)
Conductivity	10	Water conductivity in Siemens/metre, in 0.01 S/m steps. 0.0 - 7.00 Siemens/metre 7.01 = conductivity 7.01 or greater 702 = data not available 703 = sensor not available = default, 704 - 1,023 (reserved for future use)
Water Pressure	16	Pressure of water in decibars, in 0.1 decibars steps. 0.0 to 6000.0 decibars 6000.1 = pressure 6000.1 or greater 60002 = data not available 60003 = sensor not available = default 60004 - 65535 (reserved for future use)
Salinity	9	Salinity in 0.1‰ (ppt) steps. 0.0 - 50.0 ‰ 50.1 = salinity 50.1 or greater 502 = data not available = default 503 = sensor not available 504 - 511 (reserved for future use)
Salinity Type	2	Type of salinity. 0 = measured 1 = calculated using PSS-78 2 = calculated using other method 3 (reserved for future use)
Sensor Data Description	3	Type of data from Salinity sensor, as defined in Table 12.16.
Spare	35	Not used. Set to zero.
Total	**85**	

Table 12.14
Weather report

Parameter	No. of bits	Description
Air Temperature	11	Dry bulb temperature in degrees Celsius (as per 2's complement), in 0.1 degree steps. -60.0 to +60.0 degrees Celsius -1,024 = data unavailable = default -1,023 to -601 (reserved for future use) 601 - 1,023 (reserved for future use)
Sensor Data Description	3	Type of data from Air Temperature sensor, as defined in Table 12.16.
Precipitation (type)	2	According to WMO 0 = rain 1 = snow 2 = rain and snow 3 = other
Horizontal Visibility	8	Visibility in Nautical Miles, in 0.1 NM steps. 0.0 – 24.0 NM 241 = visibility 24.1 NM or greater 242 = data not available 243 = sensor not available = default 244 - 255 (reserved for future use)
Dew Point	10	Dew point temperature in degrees Celsius (as per 2's complement), in 0.1 degree steps. -20.0 to +50.0 degrees Celsius 501 = not available = default 502 - 511 (reserved for future use) -511 to -201 (reserved for future use)
Sensor Data Description	3	Type of data from Dew Point sensor, as defined in Table 12.16.
Air Pressure	9	Air pressure, defined as pressure reduced to sea level, in 1 hPa steps. 0 = pressure 800 hPa or less 1 - 401 = 800 - 1200 hPa 402 = pressure 1201 hPa or greater 403 = data not available = default 404 - 511 (reserved for future use)
Air Pressure Trend	2	Air pressure trend 0 = steady 1 = decreasing 2 = increasing 3 = undefined = default
Sensor Data Description	3	Type of data from air pressure sensor, as defined in Table 12.16.
Salinity	9	Salinity in 0.1‰ (ppt) steps. 0.0 - 50.0 ‰ 501 = salinity 50.1 or greater 511 = data not available = default 512 = sensor not available 503 - 511 (reserved for future use)
Spare	25	Not used. Set to zero.
Total	**85**	

Table 12.15
Air gap/Air draught

Parameter	No. of bits	Description
Air Draught	13	Vertical distance measured from the ship's waterline to the highest point on the ship, in 0.1 metre steps. 1 - 81.90 metres 8,191 = distance 81.91 metres or greater 0 = data not available = default
Air Gap	13	Vertical distance measured from the surface of the water to the sensor, in 0.1 metre steps. 1 - 81.9 metres 8,191 = distance 81.91 metres or greater 0 = data not available = default
Air Gap Trend	2	Trend of the air gap measurement. 0 = steady 1 = rising 2 = falling 3 = no data = default
Forecast Air Gap	13	The forecast vertical distance measured from the surface of the water to the sensor, in 0.01 metre steps. This is the measurement for the time of the forecast. 1 - 81.90 metres 8,191 = distance 81.91 metres or greater 0 = data not available = default
Valid Time of the Forecast		Valid UTC date and time of the forecast.
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default 25 - 31 (reserved for future use)
UTC Minute	6	0 - 59 60 = not available = default 61 - 63 (reserved for future use)
Spare	28	Not used. Set to zero.
Total	**85**	

Table 12.16
Type of data from sensor

Value	Description
0	no data = default
1	raw real time
2	real time with Quality Control
3	predicted (based historical statistics)
4	forecast (predicted, refined with real-time information)
5	Nowcast (a continuous forecast)
6	(reserved for future use)
7	sensor not available

13 Route information

13.1 This message allows the communication of pertinent vessel routing information. It should only be used in when important route information (e.g., mandatory or recommended route(s)) – not already provided by current official nautical charts or publications – needs to be relayed by authorities or vessels.

13.2 This message can be broadcast or addressed, depending on which alternative is more appropriate.

13.3 The information is time-dependent (i.e. has start date and time and duration).

13.4 In order to allow advance notice, this message should be transmitted prior to the start date and time specified for the routing information. It should not be transmitted more than one day in advance.

13.5 This message should not be transmitted beyond the designated date and time except for a cancellation message. A cancellation message can be transmitted using the same Message Linkage ID with Route Type of 31 (cancellation), a Duration of 0 and start date and time fields all set to not available.

13.6 ECDIS/ECS software should automatically remove the contents of the Route Information binary message from the display after the end date and time or after receiving a cancellation message.

13.7 Up to 5-slot messages can be created, however messages with more than 3 slots should be avoided.

13.8 The Message Linkage ID can be used to link additional text (e.g., a separate text message). However, the same source MMSI needs to be included in both the Route Information and additional Text Description message.

Table 13.1
Route information – (broadcast)

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Spare	2	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 27**.

Parameter	No. of bits	Description
Message Linkage ID	10	A source specific running number, unique across all binary messages equipped with Message Linkage ID. Used to link additional information to the message by a Text Description message. The Message Linkage ID and the first six digits of the source MMSI uniquely identify the sent message. 1 - 1,023 0 = not available = default
Sender Classification	3	0 = ship = default 1 = authority 2 - 7 (reserved for future use)
Route Type	5	0 = not available = default 1 = mandatory route 2 = recommended route 3 = alternative route 4 = recommended route through ice 5 = ship route plan 6 – 30 (reserved for future use) 31 = cancellation (cancel route as identified by Message Linkage ID)
Start Date and Time		Start UTC date and time.
UTC Month	4	1 - 12 0 = not available = default
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default
Duration	18	Minutes until end of validity of the route. Measured from start time of Route Information. 0 = cancel route 262,143 = not available = default
Number of Waypoints	5	Number of Waypoints 1 - 16 0 = no waypoint = default 17 - 31 (not used)
Waypoints	n x 55	Variable number of waypoints 1 - 16 (55 bit each), refer to Table 13.3. The number of waypoints is determined by the length of the message.
Spare	0	Not used. Set to zero.
Total	**172 - 997**	**Occupies 2 - 5 slots** (see Table 13.4)

Table 13.2
Route information – (addressed)

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6; always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Sequence Number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1.
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted
Spare	1	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 28** (See Rec. ITU-R M.1371-3, Annex 5, § 2.1)
Message Linkage ID	10	A source specific running number, unique across all binary messages equipped with Message Linkage ID. Used to link additional information to the message by a Text Description message. The Message Linkage ID and the first six digits of the source MMSI uniquely identify the sent message. 1 - 1,023 0 = not available = default
Sender Classification	3	0 = ship = default 1 = authority 2 - 7 (reserved for future use)
Route Type	5	0 = not available = default 1 = mandatory route 2 = recommended route 3 = alternative route 4 = recommended route through ice 5 = ship route plan 6 - 30 (reserved for future use) 31 = cancellation (cancel route as identified by Message Linkage ID)
Start Date and Time		Start UTC date and time.
UTC Month	4	1 - 12 0 = not available = default
UTC Day	5	1 - 31 0 = not available = default
UTC Hour	5	0 - 23 24 = not available = default
UTC Minute	6	0 - 59 60 = not available = default

Parameter	No. of bits	Description
Duration	18	Minutes until end of validity of the route. Measured from start date and time of Route Information. 0 = cancel route 262,143 = not available = default
Number of Waypoints	5	Number of waypoints. 1 - 16 0 = no waypoint = default 17 - 31 (not used)
Waypoints	n x 55	Variable number of waypoints 1 - 16 (55 bit each), refer to Table 13.3. The number of waypoints is determined by the length of the message.
Spare		Not used. Set to zero.
Total	**204 – 1,029**	**Occupies 2 - 5 slots** (see Table 13.4)

Table 13.3
Waypoints

Parameter	No. of bits	Description
WP i. Longitude	28	Longitude in 1/10,000 min, ±180 degrees as per 2's complement (East = positive, West = negative). 181 = not available = default
WP i. Latitude	27	Latitude in 1/10,000 min, ±90 degrees as per 2's complement (North = positive, South = negative). 91 degrees = not available = default

Table 13.4
Number of slots

Number or waypoints transmitted	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Number of slots used for a broadcast message	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5
Number of slots used for an addressed message	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	5

14 Text description

14.1 This message provides a text description in combination with other AIS Application-Specific Message.

14.2 This message can be broadcast or addressed, but must be the same as the main message that it is linked to.

14.3 The Message Linkage ID is used to link the Text Description message to another AIS Application-Specific Message (e.g., Area Notice or Route Information). The same source MMSI must be used to send both the main message and Text Description message.

14.4 Up to 5-slot messages can be created, however messages greater than 3 slots should be avoided.

Table 14.1
Text description – (broadcast)

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 8; always 8
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Spare	2	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 29**
Message Linkage ID	10	Used to link the Text Description message with a main message. The Connection ID and source MMSI MID uniquely identifies the main message. 1 - 1,023 0 = not available = default
Text String	6 - 966	Free text 1 - 161 characters 6-bits ASCII. If applicable, recommended to use IMO Standard Marine Communication Phrases (SMCP) (resolution A.918(22)). Number of slots used should be minimized, refer to Table 14.2.
Spare	0	Not used. Set to zero.
Total	**72 – 1,032**	**Occupies 1 - 5 slots** (see Table 14.2)

Table 14.2
Number of slots if sent as a broadcast message

Number of characters in the message	1-11	12-49	50-86	87-123	124-161
Number of slots used	1	2	3	4	5

Table 14.3
Text description – (addressed)

Parameter	No. of bits	Description
Message ID	6	Identifier for Message 6; always 6.
Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 - 3 0 = default 3 = do not repeat anymore
Source ID	30	MMSI number of source station.
Sequence Number	2	0 - 3; refer to § 5.3.1, Annex 2 of ITU-R M.1371-3.
Destination ID	30	MMSI number of destination station.
Retransmit Flag	1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default 1 = retransmitted
Spare	1	Not used. Set to zero.
IAI	16	DAC = 001; **FI = 30** (See Rec. ITU-R M.1371-3, Annex 5, § 2.1.
Message Linkage ID	10	Used to link the Text Description message with a main message. The Connection ID and source MMSI MID uniquely identifies the main message. 1 - 1,023 0 = not available = default
Text String	6 - 930	Free text 1 - 155 characters 6-bits ASCII). If applicable, recommended to use IMO Standard Marine Communication Phrases (SMCP) (resolution A.918(22)). Number of slots used should be minimized, refer to Table 14.4.
Spare	0	Not used. Set to zero.
Total	**104 - 1,028**	**Occupies 1 - 5 slots** (see Table 14.4).

Table 14.4
Number of slots if sent as an addressed message

Number of characters in the message	1-6	7-43	44-81	82-118	119-155
Number of slots used	1	2	3	4	5

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SN.1/Circ.290
2 June 2010

GUIDANCE FOR THE PRESENTATION AND DISPLAY OF AIS APPLICATION-SPECIFIC MESSAGES INFORMATION

1 The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), approved SN/Circ.236 on Guidance on the application of AIS binary messages as prepared by the Sub-Committee on Safety of Navigation, at its forty-ninth session (30 June to 4 July 2003).

2 The Sub-Committee on Safety of Navigation, at its forty-ninth session, selected seven (7) Application-Specific Messages as shown in annex 2 to SN/Circ.236 to be used as a trial set of messages for a period of four years with no change. It was noted that four additional system-related messages were identified in Recommendation ITU-R M.1371 for the operation of the system.

3 The Sub-Committee on Safety of Navigation (NAV), at its fifty-fifth session (27 to 31 July 2009), after evaluating the use of Application-Specific Messages in the trial period defined in SN/Circ.236, agreed on Guidance for the presentation and display of AIS Application-Specific Messages information.

4 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), concurred with the Sub-Committee's views and approved the Guidance for the presentation and display of AIS Application-Specific Messages information, as set out in the annex.

5 Member Governments are invited to bring the annexed Guidance to the attention of all concerned.

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ANNEX

PRESENTATION AND DISPLAY OF AIS APPLICATION-SPECIFIC MESSAGES INFORMATION

Introduction

At present, there is no specific guidance or standards related to the presentation and display of AIS Application-Specific Messages information on shipborne equipment or systems. While the Minimum Keyboard Display (MKD) is capable of displaying text messages, it was never intended for the graphical display and presentation of AIS Application-Specific Messages information. However, there are a number of general and equipment-specific international standards that have been adopted by IMO, IHO and IEC that contain "guidance" related to the presentation and display of various types of shipborne navigation-related information.

Standards/Guidelines

General

Performance Standards for the Presentation of Navigation-related Information on Shipborne Navigational Displays, resolution MSC.191(79), 6 December 2004.

Guidelines for the Presentation of Navigation-related Symbols, Terms and Abbreviations, SN/Circ.243, 15 December 2004.

Presentation of Navigation-related Information on Shipborne Navigational Displays – General Requirements, methods of testing, required test requirements. IEC 62288, Edition 1.0, July 2008.

Equipment-Specific

There are specific equipment/system standards that have been adopted by IMO, IHO and IEC that contain "guidance" related to the presentation/display of shipborne navigation-related information. However, most were adopted prior to resolution MSC.191(79), SN/Circ.236, or IEC 62288 being issued. Eventually, these equipment-specific performance standards will need to be "updated" in order to comply with the overall harmonized requirements contained in resolution MSC.191(79). In the interim, there does not appear to be any existing requirement that would preclude the presentation/display of any of the AIS Application-Specific Messages applications contained in SN/Circ.236 or the revised/new messages. However, it will not be possible to reach a general consensus about the consistent and uniform display of AIS binary messages until the performance standards for individual shipboard equipment and systems are aligned with resolution MSC.191(79).

ECDIS

Revised Performance Standards for ECDIS, resolution MSC.232(82), 2006.
Specifications for Chart Content and Display Aspects of ECDIS, IHO S-52, Ed. 4.2, Appendix 2, *Colour and Symbol Specifications for ECDIS*, March 2004.

Radar

Performance Standards for Radar Equipment, resolution MSC.192(79), 2004.

INS

Performance Standards for an Integrated Navigation System (INS), resolution MSC.86(70), Annex 3.

Integrated Navigation Systems (INS) – Operational and performance requirements, methods of testing and required test results. IEC 61294, Ed. 1, 2004.

AIS

Performance Standards for a Universal Shipborne Automatic Identification System (AIS), resolution MSC.74(69), Annex 3, 19 May 1998.

Guidelines for the Onboard Operational Use of Shipborne Automatic Identification Systems (AIS), resolution A.917(22), 25 January 2002.

Display of AIS Target Information, SN/Circ.217, 11 July 2001.

Guidance of the Application of AIS Binary Messages, SN/Circ.236, 28 May 2004.

Guiding Principles for the Presentation/Display of AIS Application-Specific Messages

At this time, it is premature to propose specific presentation and display standards for AIS Application-Specific Messages. More experience is needed in order to determine how AIS Application-Specific Messages information should be displayed in conjunction with other chart-related and operational information. Further, the presentation and display of AIS Application Specific Messages information should conform to the concept of operation envisioned for e-navigation. As currently defined:

> "*e-navigation is the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth-to-berth navigation and related services for safety and security at sea and protection of the marine environment.*" (NAV 54/25, annex 12).

Most likely, AIS Application-Specific Messages will become means to achieve many of the core objectives of e-navigation (NAV 54/25, annex 12):

.1 *facilitate safe and secure navigation of vessels having regard to hydrographic, meteorological and navigational information and risks;*

.2 *facilitate vessel traffic observation and management from shore/coastal facilities, where appropriate;*

.3 *facilitate communications, including data exchange, among ship to ship, ship to shore, shore to ship, shore to shore and other users;*

.4 *provide opportunities for improving the efficiency of transport and logistics;*

.5 *support the effective operation of contingency response, and search and rescue services;*

.6 *demonstrate defined levels of accuracy, integrity and continuity appropriate to a safety-critical system;*

.7 *integrate and present information on board and ashore through a human-machine interface which maximizes navigational safety benefits and minimizes any risks of confusion or misinterpretation on the part of the user;*

.8 *integrate and present information on board and ashore to manage the workload of the users, while also motivating and engaging the user and supporting decision-making.*

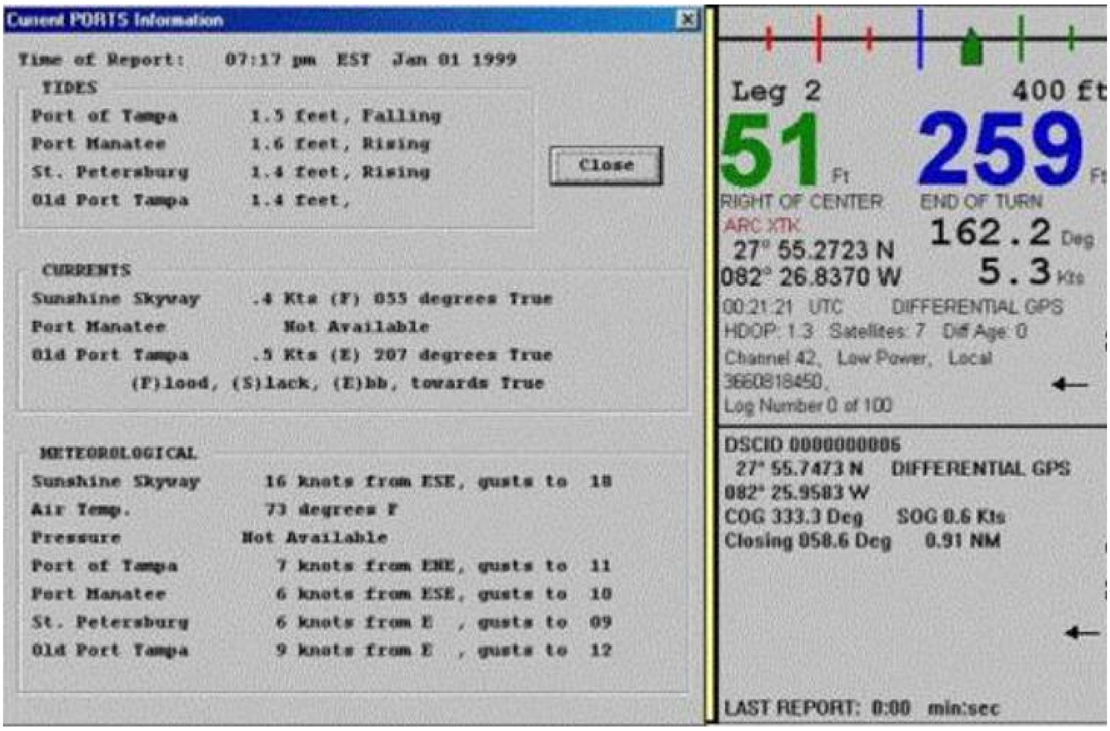
In the interim, the following guiding principles should apply to the display of AIS Application-Specific Messages information both for shipborne equipment/systems (e.g., ECDIS, radar and INS) and for shore-based systems (e.g., VTS Centre console):

1. Use **consistent** symbology across all displays
2. **Uniqueness** – only one possible meaning
3. **Non-ambiguous** – ability to determine differences (i.e. distinct)
4. **Intuitively obvious** – an easily recognized symbol, icon or pattern
5. Have a **basic symbol** for different categories. Further attributes should be enhancements (not changes) to the basic symbol.

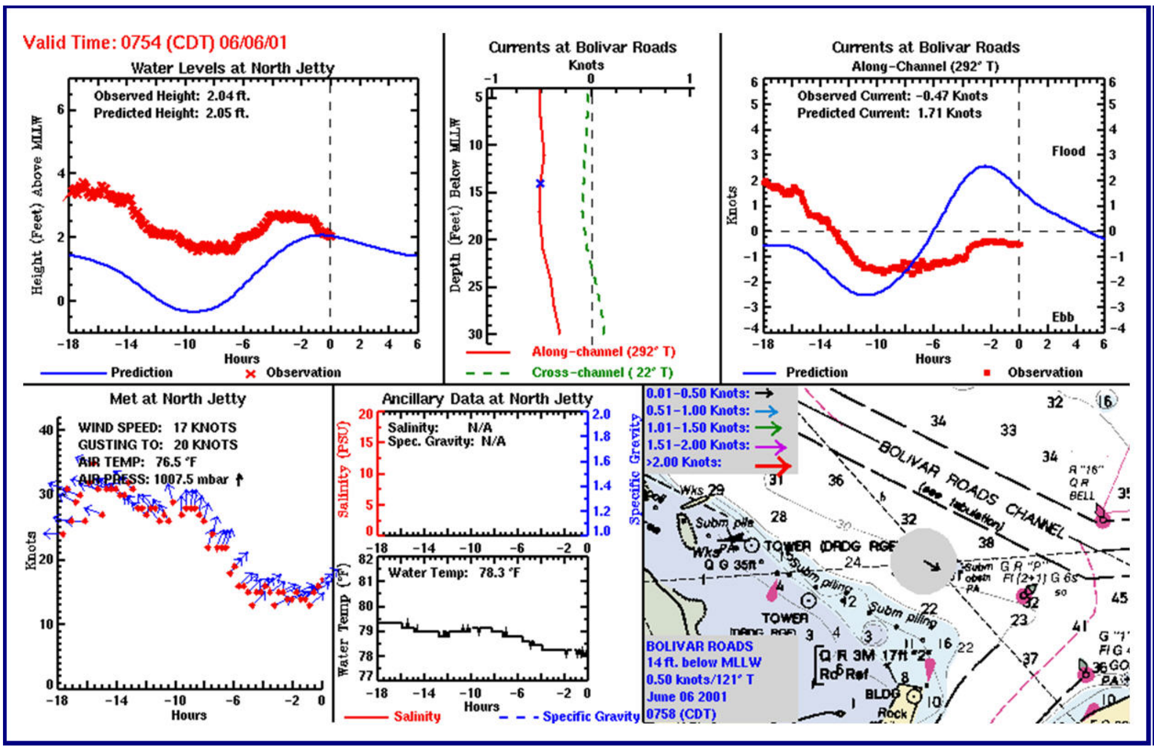
Application-Specific Message Information: Portrayal Examples

"Portrayal" is the process of representing or depicting (i.e. showing an example of what is or could be). The following are selected examples of how some of current and new Application-Specific Messages applications are being portrayed. This includes alpha-numeric, graphs, symbols and geographic (i.e. spatial) information.

Meteorological and hydrographic data (FI = 11, FI = 26)

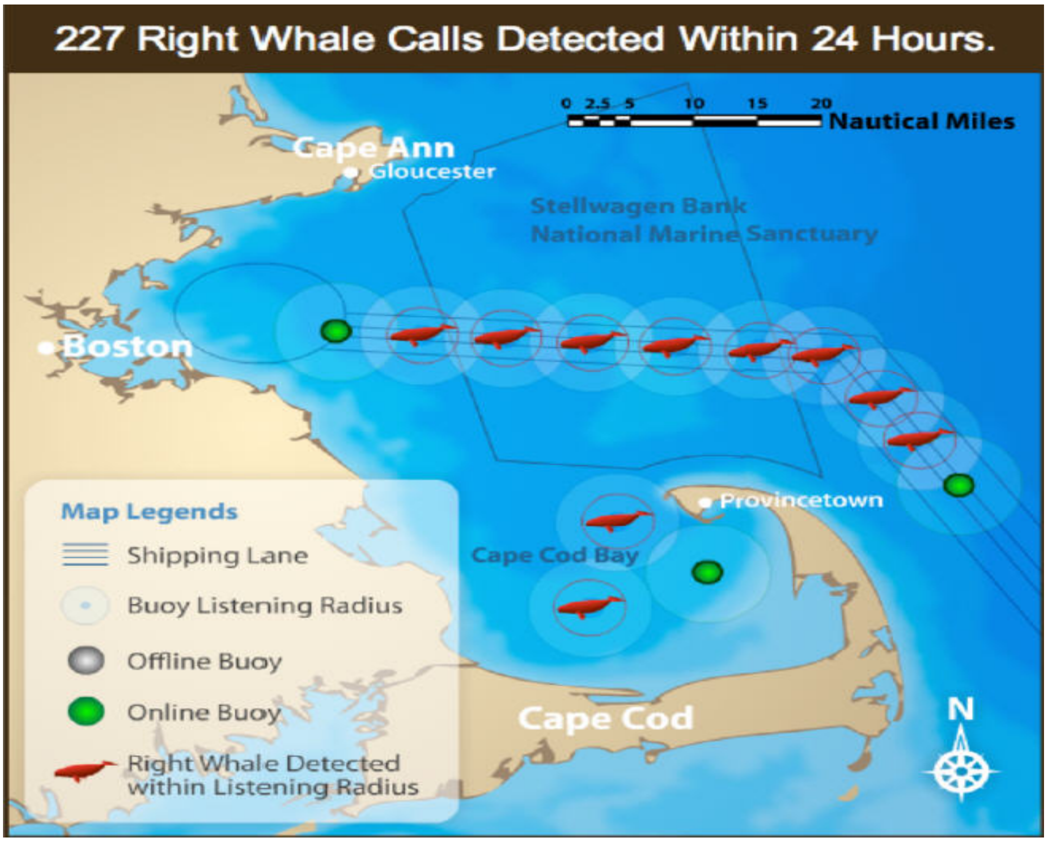


Example 1 – This is an example of real-time alpha-numeric data pertaining to tidal changes, current flow velocity, and meteorological conditions. Transmitted as an AIS Application-Specific Message from a VTS Centre, the information is displayed on Portable Pilot Units (PPUs) that are carried on board vessels by Maritime Pilots.

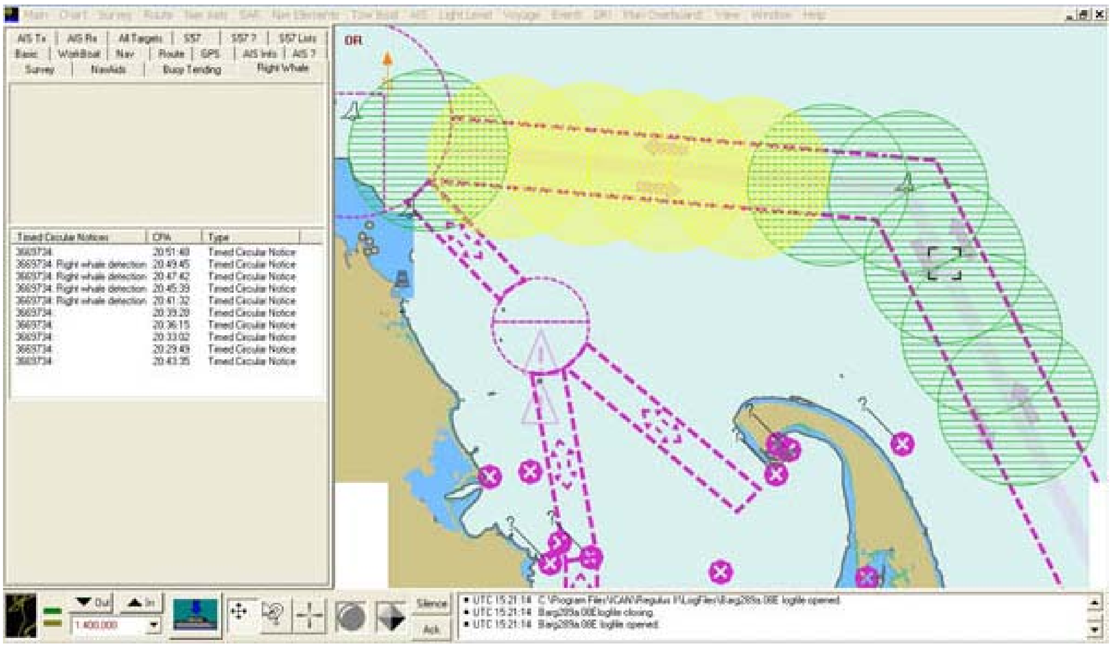


Example 2 – This is a graphical display of both predicted and observed met/hydro data. While similar to alpha-numeric text in terms of data content, the information is displayed as a time-series graphs capable of depicting differences and trends (i.e. predicted vs. observed). This also includes alpha-numeric text that is displayed over geographic data (a raster navigational chart).

Area Notice – Broadcast (FI = 22)

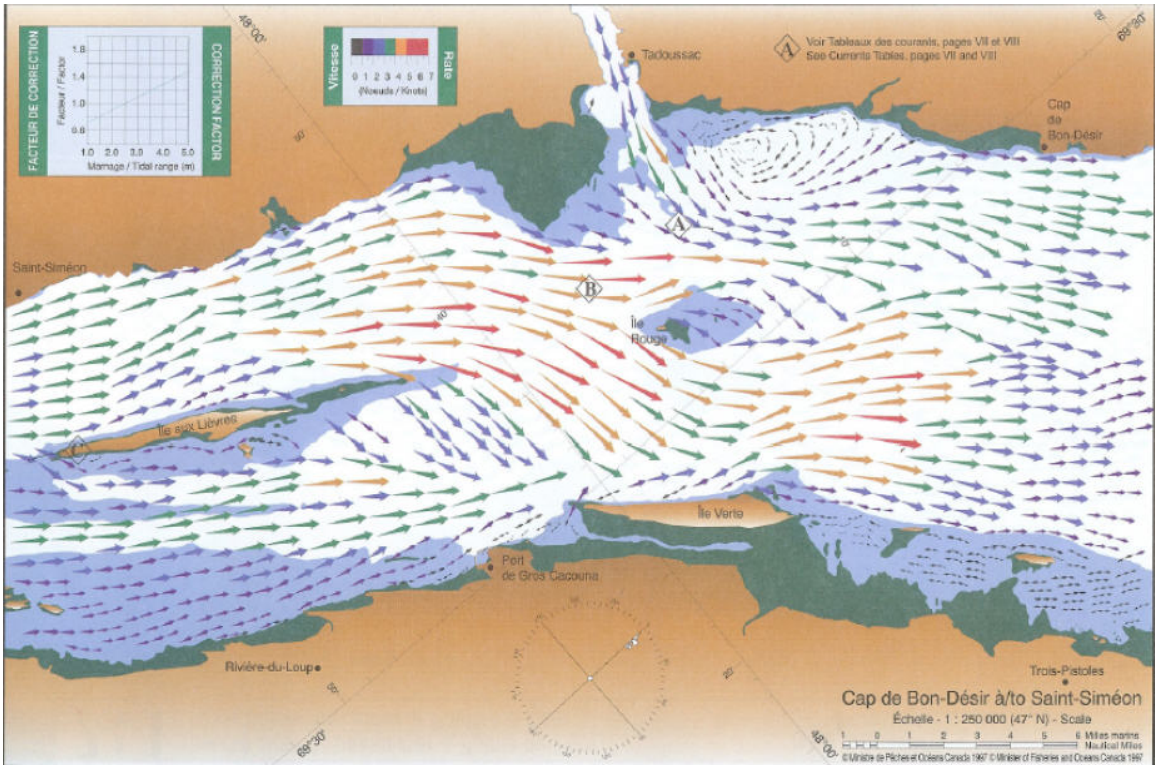


Example 1 – This is an example of shore-based geographic display of a marine sanctuary area, traffic separation scheme, locations of passive-acoustic buoys, and acoustic detections of North Atlantic right whales (an endangered species). The red-green colour scheme indicates the status of buoy operation.

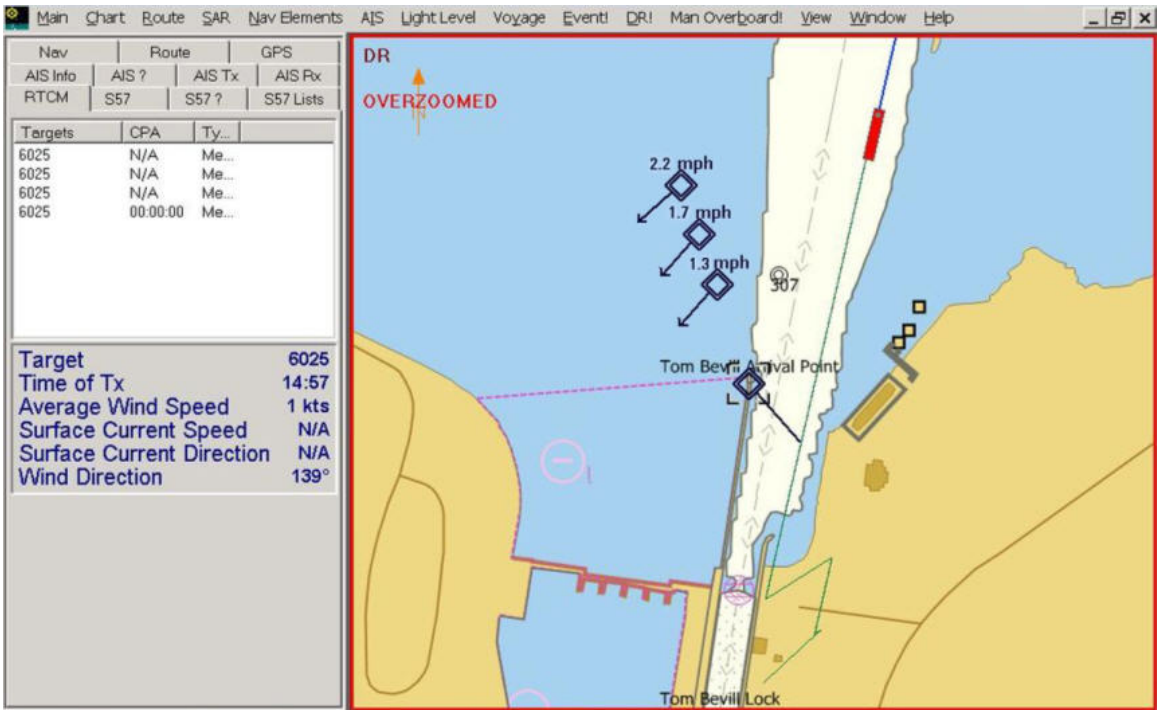


Example 2 – This is an example of data pertaining to the date/time detection and location of North Atlantic right whales (an endangered species) in a traffic separation scheme within a marine sanctuary area. Transmitted via AIS Application-Specific Message from an Operations Centre, this information is displayed on shipborne Electronic Chart System (ECS) as semi-transparent red-yellow-green colours that do not obscure the underlying Electronic Navigational Chart (ENC) data.

Tidal window (FI = 14)

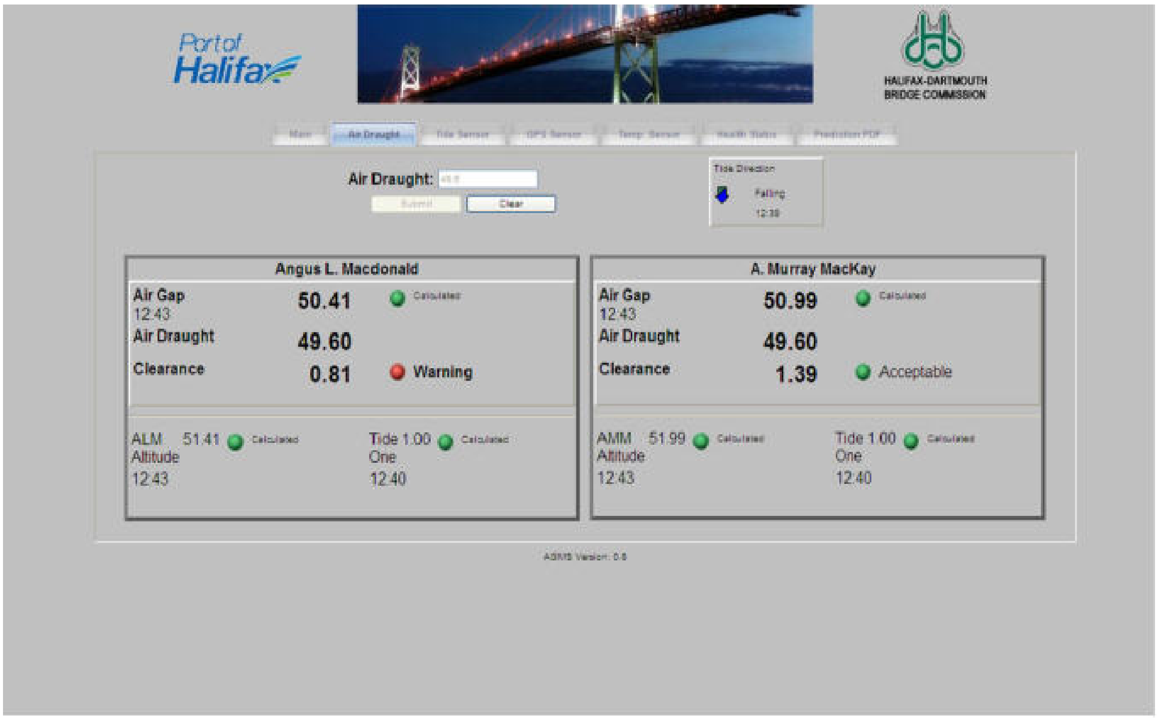


Example 1 – This is a geographical example of tidal current data. Current flow information is shown as coloured arrows (symbols) that indicate both the direction and speed of current flow for a date/time period at a specific location. This display is similar to the colour scheme used in the "Tidal Atlas" that is issued as a printed nautical publication.

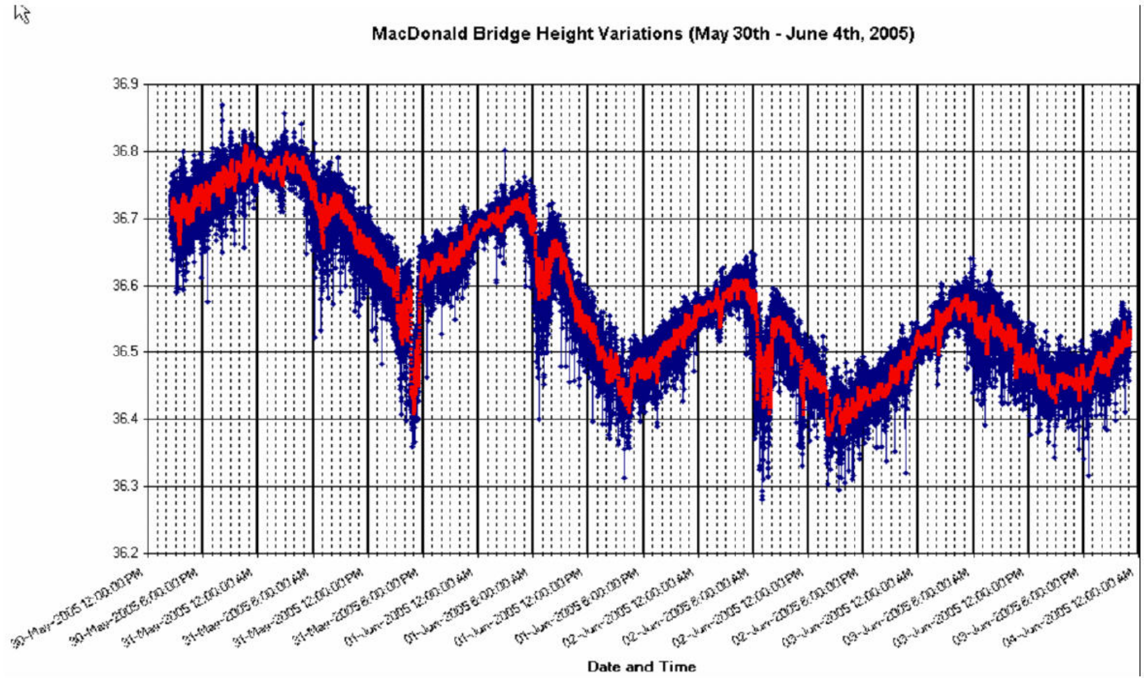


Example 2 – This is a geographic display of current flow data at the entrance of a lock on a major inland waterway. Current flow information is shown as arrow symbols that indicate the surface current speed/direction on a continuous basis. This information is transmitted via AIS Application-Specific Message from a VTS Centre, and displayed on an Electronic Chart System installed on board a towboat vessel using Inland ENC data.

Extended ship static and voyage-related data (FI = 15)

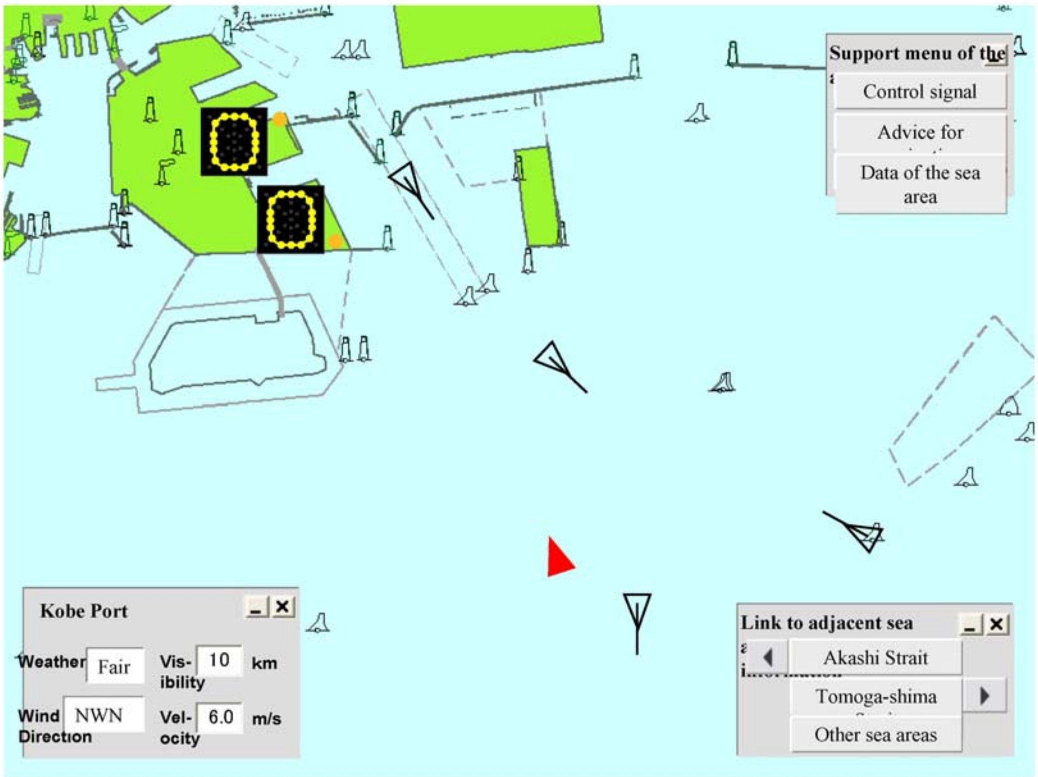


Example 1 – This is an example of real-time alpha-numeric data pertaining to air gap/air draft. Transmitted via AIS Application-Specific Message from a Port Authority, the information is displayed on Portable Pilot Units that are carried on board vessels by Maritime Pilots. A red-greed colour scheme is used to indicate a warning of exceeding minimum clearance parameters.



Example 2 – This is a graphical display of the same air gap/air draft data. While similar to alpha-numeric text in terms of data content, the information is displayed as a date/time series graph that indicates variations and trends.

Marine traffic signal (FI = 19)



Example 1 – This is an example of a geographic display of marine traffic signal data that would be sent from a VTS Centre to a vessel entering port. In addition to displaying information on a signal station and status of the control signal, there are other links capable of providing advice about the harbour and adjacent sea area, and alpha-numeric text information on local weather conditions.

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GUIDELINES FOR THE ASSESSMENT OF TECHNICAL PROVISIONS FOR THE PERFORMANCE OF AN IN-WATER SURVEY IN LIEU OF BOTTOM INSPECTION IN DRY-DOCK TO PERMIT ONE DRY-DOCK EXAMINATION IN ANY FIVE-YEAR PERIOD FOR PASSENGER SHIPS OTHER THAN RO-RO PASSENGER SHIPS

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), approved Guidelines for the assessment of technical provisions for the performance of an in-water survey in lieu of bottom inspection in dry-dock to permit one dry-dock examination in any five-year period for passenger ships other than ro-ro passenger ships, as set out in the annex, prepared by the Sub-Committee on Ship Design and Equipment at its fifty-third session.

2 The Guidelines are intended to provide guidance on technical aspects to be considered when implementing a one in five-year dry-docking regime with an in-water survey in lieu of bottom inspection in dry-dock for passenger ships of 15 years of age or less, other than ro-ro passenger ships, and to ensure that sound technical judgment is exercised by Administrations in a uniform manner, when implementing such a regime.

3 Member Governments are invited to apply the attached Guidelines when accepting an in-water survey in lieu of a bottom inspection in dry-dock, and to bring them to the attention of all parties concerned.

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ANNEX

GUIDELINES FOR THE ASSESSMENT OF TECHNICAL PROVISIONS FOR THE PERFORMANCE OF AN IN-WATER SURVEY IN LIEU OF BOTTOM INSPECTION IN DRY-DOCK TO PERMIT ONE DRY-DOCK EXAMINATION IN ANY FIVE-YEAR PERIOD FOR PASSENGER SHIPS OTHER THAN RO-RO PASSENGER SHIPS

1 Introduction

1.1 Following SOLAS regulation I/7, the Survey Guidelines under the Harmonized System of Survey and Certification (resolution A.997(25)) currently specify that inspection of a passenger ship's bottom, as required by SOLAS regulation I/7, should be carried out annually, with two inspections in dry-dock in any five-year period[1]. Where acceptable to the Administration, the minimum number of inspections in dry-dock of the outside of the bottom of a passenger ship (which is not a ro-ro passenger ship) in any five-year period may be reduced from two to one. In such cases, the interval between consecutive inspections in dry-dock shall not exceed 60 months.

1.2 It is recognized that technological advances have been made in regard to corrosion resistant materials, quality, endurance and effectiveness of hull coatings, repair in water by means of protected environment such as temporary cofferdam, implementation of effective five-year maintenance regimes and also the effectiveness of in-water survey (IWS) technology overall.

1.3 The following guidance has been developed to ensure that sound technical judgement is exercised by Administrations in a uniform manner, when allowing passenger ships to have an in-water survey in lieu of bottom inspection in dry-dock.

1.4 The guidance for in-water survey is intended to be applied to passenger ships of 15 years of age or less[2] which are not ro-ro passenger ships. Some aspects of the guidance may also be useful in ascertaining suitability of any in-water inspection of passenger ships.

2 Areas for technical consideration by the Administration

2.1 Prior to agreeing to an in-water survey, the Administration should ascertain that:

.1 the owner has requested the Administration or recognized organization (RO) to approve the in-water survey at least four weeks in advance of the intended date of the inspection. The owner's proposed schedule and the conditions for performing the in-water inspection should allow effective planning and execution of the survey;

.2 the master of the ship has confirmed in writing that the ship, to his best knowledge, has not sustained any grounding or contact damage since the previous bottom inspection and that nothing unusual has been observed to suspect that any part of the ship's bottom or protuberances has been otherwise damaged;

[1] The definition of "any five-year period" is the five-year period of validity of the International Load Line Certificate.

[2] If an in-water survey in lieu of dry-docking is proposed for the 15th anniversary of the ship's construction, it should be subject to specific agreement of the Administration based on a dry-dock examination within the previous 30 months.

.3 the Administration or its RO has reviewed the ship survey records to confirm current satisfactory condition of hull and machinery. Decisions of acceptability should be based on the condition of the ship, the hull protection system and the procedures that will be followed for the performing of the underwater survey; and

.4 a shipowner who makes a request for an IWS has completed, at a previous dry-dock, or during its initial construction, a preliminary survey of the hull to the satisfaction of the Administration or its RO that documents and establishes the ship's future suitability for an IWS. The preliminary survey will evaluate the condition of the hull and note that appropriate preparations, markings, fittings and capability have been satisfactorily installed, affixed or completed so as to accomplish the IWS in accordance with the recommendations specified in these Guidelines.

3 Conditions for in-water survey

3.1 The Administration or its RO should be satisfied that conditions for survey are sufficient to complete the survey satisfactorily. Points to consider may include those below, and classification society requirements should also support this aim.

3.2.1 The IWS should be carried out by a diving company that is approved by the Administration or its RO, and in accordance with an approved plan.

3.2.2 Diving companies providing services on behalf of the owner of a ship or a mobile offshore unit (such as measurements, tests, surveys or maintenance of safety systems and equipment), the results of which are used by the surveyors in making decisions affecting certification, should be subject to approval by the Administration or its RO.

3.2.3 Diving companies should undergo an approval process, including training, and should be certified at intervals not exceeding five years, and nay be subject to intermediate audit.

3.2.4 The in-water survey should be performed to the satisfaction of the attending Administration or RO surveyor who is properly trained and authorized to conduct such surveys. Training and qualification of the attending authorized surveyor from an RO should be in accordance with the quality system requirements of the RO and resolution A.739(18), as verified by periodic audit.

3.3 The in-water survey should be carried out at an agreed geographical location with the ship at a suitable draught in an area that has been demonstrated to have sheltered waters and with weak tidal streams and currents. The weather at the time of the survey should be conducive to a safe and effective IWS.

3.4 Surveys of the underwater body should be carried out in sufficiently clear and calm waters. In general, for example, a significant portion of the propeller or rudder should be clearly observed from a single view. Visibility and water conditions should be suitable to provide sufficient evidence to be able to draw a conclusion that the hull inspection requirements have been met and the hull is in satisfactory condition.

3.5 The surveyor should be satisfied that the hull marking and mapping as well as the method of pictorial presentation are satisfactory. To facilitate an efficient survey it is recommended that the underwater hull and fittings are permanently and clearly marked externally (including tank boundaries).

3.6 Sufficient information to the satisfaction of the attending surveyor, including specific plans to facilitate the survey, should be available on board in order to ensure a full assessment and survey.

3.7 Unless accessible from outside with the aid of the ship's trim and/or heel, underwater parts should be surveyed and/or relevant maintenance work should be carried out with assistance by a diver to the satisfaction of the attending surveyor. The survey should include CCTV monitoring of the IWS, together with electronic video and still picture (if required and where appropriate) recording of the ship's hull, appendages, sea-chests and other elements of the survey. There should be good two-way communication between the diver and the personnel at the surface, including the surveyor.

3.8 The hull below the waterline should be sufficiently clean to the satisfaction of the surveyor and diver so as to be able to ascertain the physical condition of the hull and coating.

3.9 Interior sections of the hull plating should be made available for inspection to the same extent as if the ship were in dry-dock.

4 Survey findings

4.1 If the IWS reveals damage, deterioration or other conditions that require early attention or which can only be assessed reliably out of water, the surveyor may require that the ship be dry-docked in order that a fuller survey can be undertaken and the necessary work carried out. If the condition of the hull is such that it may cause corrosion damages affecting the ship's hull integrity and strength before the next survey, suitable repairs should be carried out.

4.2 The Administration should be informed of the results of all in-water surveys.

5 Maintenance considerations

5.1 A basic requirement for consideration to allow one inspection in dry-dock in five years is that a comprehensive maintenance regime based upon a five-year cycle should be effectively implemented by the company for the relevant items. The items to be considered may include the following:

.1 *Shafting and stern tube* – Stern tube bearings should be oil lubricated or, in the case of water lubricated systems, the shafting should be of corrosion resistant material. Where weardown measurements are unable to be taken, special consideration may be given to ascertaining sternbush clearances based on a review of the operating history, onboard testing and stern bearing oil analysis.

.2 *Shell coating* – The hull coating system should be able to perform its functions of corrosion protection and anti-fouling over the anticipated five-year period in water. The use of a high resistance coating or advanced coating, such as silicone-based paint, would be examples of typical coating systems that could be accepted.

.3 *Shaft seals* – Shaft seals should be capable of five-year service. The use of advanced systems such as air seals with failure mode redundancy could be considered as offering added confidence of service life.

.4 *Bow thrusters and stern thrusters* – Inspection and replacement of propeller blade foot seals of the bow thrusters and stern thrusters should be based upon a five-year interval, taking into account the lubricating oil record. Bow and stern thrusters dismantling for general overhauling may be considered at intervals greater than five years, in accordance with manufacturer's recommendations.

.5 *Rope cutters* – The fitting of rope cutters may be an added safeguard to give confidence to continued trouble-free operation of propulsion shaft, propeller and seals.

.6 *Main propellers and shafting for controllable pitch propellers (CPP) ships* – Main propeller blade foot seals and the shaft seals replacement interval should be in accordance with the five-year regime, taking into account the lubricating oil record. Main propeller hub dismantling for general overhauling may be considered at intervals greater than five years. Screwshaft surveys should normally be carried out at five-year intervals, unless a screwshaft condition monitoring scheme is in effect.

.7 *Rudders* − Rudders and rudder bearings (e.g., pintles and stocks) should be inspected and bearing clearances taken at those in-water surveys carried out in lieu of dry-dock surveys. Additionally, rudders should be inspected and rudder bearing clearances taken every five years in dry-dock. When oil lubricated bearing clearances are unable to be taken at those in-water surveys carried out in lieu of dry-dock surveys, special consideration may be given to ascertaining those bearing clearances based on a review of the operating history and onboard testing. Replacement of the sliding block and flap bushes of Becker rudders may be considered at intervals greater than five years.

.8 *Sea chests* – Means, such as hinged gratings, should be provided on all sea chests to allow divers access to each sea chest to inspect the external sides of through hull connections and sea valves.

.9 *Anodes and cathodic protection and sea valves* – The operator's maintenance regime should include provisions for inspection and replacement of cathodic protection anodes, taking into account that replacement of sacrificial anodes is variable, according to the conditions experienced. Sea valves that are found to be in need of replacement at the in-water survey should be replaced without delay.

.10 *Hull thickness measurements* – Requirements for thickness measurements of hull structure should not be prohibited by any in-water survey.

.11 *Podded Propulsion Units (PODs)* – Scheduled replacement of the drive end and non-drive end bearings on the PODs and inspection and replacement of seals should be based upon a five-year maintenance regime.

5.2 The items listed above are not exhaustive and other items of fittings and equipment may be considered to be included in such a maintenance regime.

5.3 In all cases, the design life of components, manufacturers recommended maintenance, company's implemented ship's maintenance system and classification society survey requirements should not conflict with the bottom inspection of passenger ships when the inspection is intended to be carried out in dry-dock only once in any five-year period.

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