PARTE II RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF VESSELS IDENTIFIED BY THEIR MISSIONS

TITLE 25 HIGH SPEED CRAFT

SECTION 8 NAUTIC AND ELECTRONICS

CHAPTERS

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A1. INCORPORATION OF THE INTERNATIONAL CODE OF SAFETY FOR HIGH SPEED VESSELS BY THE RBNA RULES

100. Incorporation of the Code

101. The present Part II, Title 25 of the Rules incorporate the International Code of Safety of High Speed Vessels in its entirety.

102. The original terminology of the Code has been maintained.

103. Under the conditions of A1.101 and A1.102 above and in those provisions of the HSC Code that are being used for classification purposes the words “Administration” and “Code”, wherever mentioned, are to be understood as equivalent to the words “Society” and “Rules”, respectively. The RBNA “Rules for the Construction and Classification of Ships destined to Open Sea Navigation” are referred to below simply as “Society Rules”.

104. Equipment and arrangements dealt with in the parts of the Code such as those concerning life-saving appliances, radio communications and operational aspects, which are not subject to control by the Society, have been maintained to keep the integrity of the Code, and are to be covered by the relevant certification.

105. All the original texts from the code have been identified by a vertical line on the right side of the text, as demonstrated here.

106. Additional requirements and comments are inserted at the relevant Part of the Code are identified by the words “RBNA comment” before the text.

A2. APPLICATION

100. Application

101. The present Section 8 of Part II, Title 25, contains additional requirements to those of Part II, Title 11, Section 8 and applies to:

a. passenger craft which do not proceed in the course of their voyage more than four hours at operational speed from a place of refuge; and

b. cargo craft of 500 gross tonnage and upwards which do not proceed in the course of their voyage more than 8 h at operational speed from a place of refuge when fully laden.

102. RBNA comment: In addition these Rules also apply as far as appropriate to cargo craft of less than 500 tons gross tonnage.

200. Application for vessel with GT ≥ 500 engaged in international voyages

201. 1.4 This Code applies to high speed craft engaged in international voyages the keels of which are laid or which are at a similar stage of construction on or after 1 July 2002.

300. RBNA comment: Application for vessels with GT < 500 engaged in national or international voyages

301. In addition, these Rules also apply to:

a. high speed craft engaged in national voyages;

b. high speed craft having GT < 500.

302. Exemptions from some of the requirements of the Rules may be granted when particular circumstances (e.g. restricted services) warrant this, in the opinion of the RBNA

A3. STANDARDS AND REGULATIONS

Recommendation on performance standards for magnetic compasses (resolution A.382(X));

Recommendation on performance standards for marine transmitting magnetic heading devices (TMHDs) (resolution MSC.86(70), annex 2);

Recommendation on performance standards for Gyro-compasses for high-speed craft (resolution A.821(19));

Recommendation on performance standards for devices to indicate speed and distance (resolution A.824(19), as amended by resolution MSC.96(72));

Recommendation on performance standards for echo-sounding equipment (resolution A.224(VII) as amended by MSC.74(69), annex 2);

Recommendation on performance standards for navigational radar equipment for high-speed craft (resolution A.820(19));

Recommendation on performance standards for "Auto Tracking" (resolution MSC.64(67), annex 4, appendix 1);

Recommendation on performance standards for shipborne Decca navigator receivers (resolution A.816(19));

Recommendation on performance standards for shipborne Loran-C and Chayka receivers (resolution A.818(19));

Recommendation on performance standards for shipborne global positioning system receiver equipment (resolution A.819(19));

Recommendation on performance standards for shipborne GLONASS receiver equipment (resolution MSC.53(66));

Recommendation on performance standards for shipborne DGPS and DGLONASS maritime radio beacon receiver equipment (resolution MSC.64(67), annex 2);

Recommendation on performance standards for combined GPS/GLONASS receiver equipment (resolution MSC.74(69), annex 1);

Performance standards for rate-of-turn indicators (resolution A.526(13));

Recommendation on performance standards for night vision equipment for high-speed craft (resolution MSC.94(72));

Recommendation on performance standards for daylight signalling lamps (resolution MSC.95(72)); and

Recommendation on performance standards for automatic steering aids (automatic pilots) for high-speed craft (resolution A.822(19)).

CHAPTER E
NAVIGATIONAL AIDS, SIGNALS AND COMMUNICATION EQUIPMENTS

CHAPTER CONTENTS

E1. NAVIGATIONAL AIDS [Chapter 13]

100. 13.1 General

13.1.1 This chapter covers items of equipment which relate to the navigation of the craft as distinct from the safe functioning of the craft. The following paragraphs set out the minimum requirements.

13.1.2 The equipment and its installation shall be to the satisfaction of the Administration. The Administration shall determine to what extent the provisions of this chapter do not apply to craft below 150 gross tonnage.

13.1.3 The information provided by navigational systems and equipment shall be so displayed that the probability of misreading is reduced to a minimum. Navigational systems and equipment shall be capable of giving readings to an optimum accuracy.

200. Navigational aids

201. 13.2 Compasses

a. 13.2.1 Craft shall be provided with a magnetic compass which is capable of operating without electrical supply, and which may be used for steering purposes. This compass shall be mounted in a suitable binnacle containing the required correcting devices and shall be suitable for the speed and motion characteristics of the craft.

b. 13.2.2 The compass card or repeater shall be capable of being easily read from the position at which the craft is normally controlled.

c. 13.2.3 Each magnetic compass shall be properly adjusted and its table or curve of residual deviations shall be available at all times

d. 13.2.4 Care shall be taken in siting a magnetic compass or magnetic sensing element so that

magnetic interference is eliminated or minimized as far as is practicable.

e. 13.2.5 Passenger craft certified to carry 100 passengers or less shall, in addition to the compass required by 3.2.1, be provided with a properly adjusted transmitting heading device, suitable for the speed and motion characteristics and area of operation of the craft, capable of transmitting a true heading reference to other equipment.

f. 13.2.6 Passenger craft certified to carry more than 100 passengers and cargo craft shall, in addition to the compass required in 13.2.1, be provided with a gyro-compass which shall be suitable for the speed and motion characteristics and area of operation of the craft.

202. 13.3 Speed and distance measurement

a. 13.3.1 Craft shall be provided with a device capable of indicating speed and distance

b. 13.3.2 Speed- and distance-measuring devices on craft fitted with an automatic radar plotting aid (ARPA) or automatic tracking aid (ATA) shall be capable of measuring speed and distance through the water.

203. 13.4 Echo-sounding device

a. 13.4.1 Non-amphibious craft shall be provided with an echo-sounding device which will give an indication of depth of water to a sufficient degree of accuracy for use when the craft is in the displacement mode.

204. 13.5 Radar installations

a. 13.5.1 Craft shall be provided with at least one azimuth-stabilized radar operating on 9 GHz.

b. 13.5.2 Craft of 500 gross tonnage and upwards or craft certified to carry more than 450 passengers shall also be provided with a 3 GHz radar or where considered appropriate by the Administration, a second 9 GHz radar or other means to determine and display the range and bearing of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance, which are functionally independent of those referred to in 13.5.1.

c. 13.5.3 At least one radar shall be provided with facilities for an ARPA or ATA suitable for the motion and speed of the craft.

d. 13.5.4 Adequate communication facilities shall be provided between the radar observer and the person in immediate charge of the craft.

e. 13.5.5 Each radar installation provided shall be suitable for the intended craft speed, motion characteristics and commonly encountered environmental conditions.

f. 13.5.6 Each radar installation shall be mounted so as to be as free as practicable from vibration.

205. 13.6 Electronic positioning systems

a. Craft shall be provided with a receiver for a global navigation satellite system or a terrestrial radio navigation system, or other means, suitable for use at all times throughout the intended voyage to establish and update the craft' s position by automatic means.

206. 13.7 Rate-of-turn indicator and rudder angle indicator

a. 13.7.1 Craft of 500 gross tonnage or upwards shall be provided with a rate-of-turn indicator. A rate-of-turn indicator shall be provided in craft of less than 500 gross tonnage if the test according to annex 9 shows that the turn rate can exceed safety level 1

b. 13.7.2 Craft shall be provided with an indicator showing the rudder angle. In craft without a rudder, the indicator shall show the direction of steering thrust.

207. 13.8 Nautical charts and nautical publications

a. 13.8.1 Craft shall be provided with nautical charts and nautical publications to plan and display the ship' s route for the intended voyage and to plot and monitor positions throughout the voyage; an electronic chart display and information system (ECDIS) may be accepted as meeting the chart carriage requirements of this paragraph.

b. 13.8.2 High-speed craft shall be fitted with an ECDIS as follows:

b.1. .1 craft constructed on or after 1 July 2008;

b.2. .2 craft constructed before 1 July 2008, not later than 1 July 2010.

c. 13.8.3 Back-up arrangements shall be provided to meet the functional requirements of 13.8.1, if this function is partly or fully fulfilled by electronic means.

208. 13.9 Searchlight and daylight signalling lamp

a. 13.9.1 Craft shall be provided with at least one adequate searchlight, which shall be controllable from the operating station.

b. 13.9.2 One portable daylight signalling lamp shall be provided and maintained ready for use in the operating compartment at all times.

209. 13.10 Night vision equipment

a. 13.10.1 When operational conditions justify the provision of night vision equipment, such equipment shall be provided.

210. 13.11 Steering arrangement and propulsion indicator(s)

a. 13.11.1 The steering arrangement shall be so designed that the craft turns in the same direction as that of the wheel, tiller, joystick or control lever.

b. 13.11.2 Craft shall be provided with means to show the mode of the propulsion system(s).

c. 13.11.3 Craft with emergency steering positions shall be provided with arrangements for supplying visual compass readings to the emergency steering position.

211. 13.12 Automatic steering aid (automatic pilot)

a. 13.12.1 Craft shall be provided with an automatic steering aid (automatic pilot).

b. 13.12.2 Provision shall be made to change from the automatic to manual mode by a manual override.

212. 13.13 Radar reflector

a. If practicable, craft of 150 gross tonnage or below shall be provided with a radar reflector, or other means, to assist detection by ships navigating by radar at both 9 and 3 GHz.

213. 13.14 Sound reception system

b. When the craft' s bridge is totally enclosed and unless the Administration determines otherwise, craft shall be provided with a sound reception system, or other means, to enable the officer in charge of the navigational watch to hear sound signals and determine their direction.

214. 3.15 Automatic identification system

a. 13.15.1 Craft shall be provided with an automatic identification system (AIS).

AIS shall:

a.1. .1 provide automatically to appropriately equipped shore stations, other vessels and aircraft information, including the craft' s identity, type, position, course, speed, navigational status and other safety-related information;

a.2. .2 receive automatically such information from similarly fitted vessels;

a.3. .3 monitor and track vessels; and

a.4. .4 exchange data with shore based facilities.

a.5. 13.15.3 The requirements of 13.15.2 shall not apply where international agreements, rules or standards provide for the protection of navigational information.

a.6. 13.15.4 AIS shall be operated taking into account the guidelines adopted by the Organization.

215. 13.16 Voyage data recorder

a. 13.16.1 To assist in casualty investigations, passenger craft irrespective of size and cargo craft of 3,000 gross tonnage and upwards shall be provided with a voyage data recorder (VDR).

b. 13.16.2 The voyage data recorder system, including all sensors, shall be subjected to an annual performance test. The test shall be conducted by an approved testing or servicing facility to verify the accuracy, duration and recoverability of the recorded data. In addition, tests and inspections shall be conducted to determine the serviceability of all protective enclosures and devices fitted to aid location. A copy of the certificate of compliance issued by the testing facility, stating the date of compliance and the applicable performance standards, shall be retained on board the craft.

216. 13.17 Approval of systems and equipment, and performance standards

300. Approval of equipment

301. 13.17.1 All equipment to which this chapter applies shall be of a type approved by the Administration. Such equipment shall conform to performance standards not inferior to those adopted by the Organization. (See Subchapter A3 above).

302. 13.17.2 The Administration shall require that manufacturers have a quality control system audited by a competent authority to ensure continuous compliance with the type approval conditions. Alternatively, the Administration may use final product verification procedures where compliance with the type approval certificate is verified by a competent authority before the product is installed on board craft.

303. 13.17.3 Before giving approval to navigational systems or equipment embodying new features not covered by this chapter, the Administration shall ensure that such features support functions at least as effective as those required by this chapter.

304. 13.17.4 When equipment, for which performance standards have been developed by the Organization, is carried on craft in addition to those items of equipment required by this chapter, such additional equipment shall

be subject to approval and shall, as far as practicable, comply with performance standards not inferior to those adopted by the Organization.

E3. COMMUNICATION EQUIPMENT [Chapter 14]

100. Radiocommunications

101. 14.1.1 Unless expressly provided otherwise, this chapter applies to all craft specified in 1.3.1 and 1.3.2

102. 14.1.2 This chapter does not apply to craft to which this Code would otherwise apply while such craft are being navigated within the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of the St. Lambert Lock at Montreal in the Province of Quebec, Canada

* Such craft are subject to special requirements relative to radio for safety purposes, as contained in the relevant agreement between Canada and the United States.

103. 14.1.3 No provision in this chapter shall prevent the use by any craft, survival craft or person in distress of any means at their disposal to attract attention, make known their position and obtain help.

200. 14.2 Terms and definitions

201. 14.2.1 For the purpose of this chapter, the following terms shall have the meanings defined below:

202. .1 "Bridge-to-bridge communications" means safety communications between craft and ships from the position from which the craft is normally navigated.

203. .2 "Continuous watch" means that the radio watch concerned shall not be interrupted other than for brief intervals when the craft' s receiving capability is impaired or blocked by its own communications or when the facilities are under periodical maintenance or checks.

204. .3 "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 Telecommunication Union Radiocommunication Sector (ITU-R).

205. .4 "Direct-printing" telegraphy means automated telegraphy techniques which comply with the relevant recommendations of the International Telecommunication Union Radiocommunication Sector (ITU-R).

206. .5 "General radiocommunications" means operational and public correspondence traffic other than distress, urgency and safety messages, conducted by radio.

207. .6 "Global Maritime Distress and Safety System (GMDSS) Identities" means maritime mobile services identity, the craft' s call sign, Inmarsat identities and serial number identity which may be transmitted by the craft' s equipment and used to identify the craft.

208. .7 "Inmarsat" means the Organization established by the Convention on the International Maritime Satellite Organization (Inmarsat) adopted on 3 September 1976.

209. .8 "International NAVTEXservice" 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

Refer to the NAVTEX Manual approved by the Organization.

210. .9 "Locating" means the finding of the ships, craft, aircraft, units or persons in distress.

211. .10 "Maritime safety information" means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships and craft.

212. .11 "Polar orbiting satellite service" means a service which is based on polar orbiting satellites which receive and relay distress alerts from satellite EPIRBs and which provides their position.

213. .12 "Radio Regulations" mean the Radio Regulations annexed to, or regarded as being annexed to, the most recent International Telecommunication Convention which is in force at any time.

214. .13 "Sea area A1" means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available, as may be defined by a Contracting Government to the Convention.**

215. .14 "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 to the Convention

Refer to the Provision of radio services for the global maritime distress and safety system (GMDSS), adopted by the Organization by resolution A.801(19).

216. .15 "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.

217. .16 "Sea area A4" means an area outside sea areas A1, A2 and A3.

218. 14.2.2 All other terms and abbreviations which are used in this chapter and which are defined in the Radio Regulations and in the International Convention on

Maritime Search and Rescue (SAR), 1979, as it may be amended, shall have the meanings as defined in those Regulations and the SAR Convention.

300. 14.3 Exemptions

301. 14.3.1 It is considered highly desirable not to deviate from the requirements of this chapter; nevertheless the Administration, in conjunction with the base port State, may grant partial or conditional exemptions to individual craft from the requirements of 14.7 to 14.11 provided:

a. .1 such craft comply with the functional requirements of E3.400.; and

b. .2 the Administration has taken into account the effect such exemptions may have upon the general efficiency of the service for the safety of all ships and craft.

302. 14.3.2 An exemption may be granted under E3.301 only:

a. .1 if the conditions affecting safety are such as to render the full application of E3.600 to E3.101. unreasonable or unnecessary; or

b. .2 in exceptional circumstances, for a single voyage outside the sea area or sea areas for which the craft is equipped.

303. 14.3.3 Each Administration shall submit to the Organization, as soon as possible after the first of January in each year, a report showing all exemptions granted under E3.301 and E3.302. during the previous calendar year and giving the reasons for granting such exemptions. E3.303. Global Maritime Distress and Safety System Identities

304. 14.4.1 This section applies to all craft on all voyages.

305. 14.4.2 Each Administration undertakes to ensure that suitable arrangements are made for registering Global Maritime Distress and Safety System (GMDSS) Identities and for making information on these identities available to Rescue Co-ordination Centres on a 24-hour basis. Where appropriate, international organizations maintaining a registry of these identities shall be notified by the Administration of these assignments.

400. 14.5 Functional requirements

401. 14.5.1 Every craft, while at sea, shall be capable:

a. .1 except as provided in E3.510. and E3.520.e., of transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;

b. .2 of receiving shore-to-ship distress alerts;

c. .3 of transmitting and receiving ship-to-ship distress alerts;

d. .4 of transmitting and receiving search and rescue co-ordinating communications;

e. .5 of transmitting and receiving on-scene communications;

f. .6 of transmitting and, as required by E1.204., receiving signals for locating

g. Refer to Carriage of radar operating in the frequency band 9,300 - 9,500 MHz, adopted by the Organization by resolution A.614(15).

h. .7 of transmitting and receiving* maritime safety information;

i. It should be noted that craft may have a need for reception of certain maritime safety information while in port.

j. .8 of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks subject to E3.711.; and

k. .9 of transmitting and receiving bridge-to-bridge communications.

500. 14.6 Radio installations

501. 14.6.1 Every craft shall be provided with radio installations capable of complying with the functional requirements prescribed by E3.400.; throughout its intended voyage and, unless exempted under E3.300., complying with the requirements of E3.600. and, as appropriate for the sea area or areas through which it will pass during its intended voyage, the requirements of either E3.510., E3.516., E3.510 or E3.101..

502. 14.6.2 Every radio installation shall:

a. .1 be so located that no harmful interference of mechanical, electrical or other origin affects its proper use, and so as to ensure electromagnetic compatibility and avoidance of harmful interaction with other equipment and systems;

b. .2 be so located as to ensure the greatest possible degree of safety and operational availability;

c. .3 be protected against harmful effects of water, extremes of temperature and other adverse environmental conditions;

d. .4 be provided with reliable, permanently arranged electrical lighting, independent of the main sources of electrical power, for the adequate illumination of the radio controls for operating the radio installation; and

e. .5 be clearly marked with the call sign, the ship station identity and other codes as applicable for the use of the radio installation.

503. 14.6.3 Control of the VHF radiotelephone channels, required for navigational safety, shall be immediately available on the navigating bridge convenient to the conning position, and, where necessary, facilities shall be available to permit radio communications from the wings of the navigating bridge. Portable VHF equipment may be used to meet the latter provision.

504. 14.6.4 In passenger craft, a distress panel shall be installed at the conning position. This panel shall contain either one single button which, when pressed, initiates a distress alert using all radio communication installations required on board for that purpose or one button for each individual installation. The panel shall clearly and visually indicate whenever any button or buttons have been pressed. Means shall be provided to prevent inadvertent activation of the button or buttons. If the satellite EPIRB is used as the secondary means of distress alerting and is not remotely activated, it shall be acceptable to have an additional EPIRB installed in the wheelhouse near the conning position.

505. 14.6.5 In passenger craft, information on the craft' s position shall be continuously and automatically provided to all relevant radio communication equipment to be included in the initial distress alert when the button or buttons on the distress panel is pressed.

506. 14.6.6 In passenger craft, a distress alert panel shall be installed at the conning position. The distress alarm panel shall provide visual and aural indication of any distress alert or alerts received on board and shall also indicate through which radiocommunication service the distress alerts have been received.

507. 14.7 Radio equipment: general

508. 14.7.1 Every craft shall be provided with:

a. .1 a VHF radio installation capable of transmitting and receiving:

a.1. .1.1 DSC on the frequency 156.525 MHz (channel 70). It shall be possible to initiate the transmission of distress alerts on channel 70 from the position from which the craft is normally navigated; and

a.2. .1.2 radiotelephony on the frequencies 156.300 MHz (channel 6), 156.650 MHz (channel 13) and 156.800 MHz (channel 16);

a.3. 2 a radio installation capable of maintaining a continuous DSC watch on VHF channel 70 which may be separate from, or combined with, that required by 14.7.1.1.1;

a.4. .3 a search and rescue locating device which:

a.5. .3.1 shall be so stowed that it can be easily utilized; and

a.6. .3.2 may be one for a survival craft;

a.7. .4 a receiver capable of receiving International NAVTEX service broadcasts if the craft is engaged on voyages in any area in which an International NAVTEX service is provided;

a.8. .5 a radio facility for reception of maritime safety information by the Inmarsat enhanced group calling system* if the craft is engaged on voyages in any area of Inmarsat coverage but in which an International NAVTEX service is not provided. However, craft engaged exclusively on voyages in areas where a HF direct printing telegraphy maritime safety information service is provided and fitted with equipment capable of receiving such service may be exempt from this requirements

Refer to Carriage of Inmarsat enhanced group call Safety NET receivers under the GMDSS, adopted by the Organization by resolution A.701(17).

Refer to the Recommendation on Promulgation of Maritime Safety Information, adopted by the Organization by resolution A.705(17).

a.9. .6 subject to the provisions of E3.511.c., a satellite emergency position indicating radio beacon (satellite EPIRB)* which shall be

a.10. Refer to Search and rescue homing capability, adopted by the Organization by resolution A.616(15).

a.11. .6.1 capable of transmitting a distress alert either through the polar orbiting satellite service operating in the 406 MHz band or, if the craft is engaged only on voyages within Inmarsat coverage, through the Inmarsat geostationary satellite service operating in the 1.6 GHz band;

a.12. .6.2 installed in an easily accessible position;

a.13. .6.3 ready to be manually released and capable of being carried by one person into a survival craft;

a.14. .6.4 capable of floating free if the craft sinks and of being automatically activated when afloat; and

a.15. .6.5 capable of being activated manually.

509. 14.7.2 Every passenger craft shall be provided with means for two-way on-scene radiocommunications for search and rescue purposes using the aeronautical frequencies 121.5 MHz and 123.1 MHz from the position from which the craft is normally navigated.

510. 14.8 Radio equipment: sea area A1

511. 14.8.1 In addition to meeting the requirements of 14.7, every craft engaged on voyages exclusively in sea area A1 shall be provided with a radio installation capable of initiating the transmission of ship-to-shore distress alerts from the position from which the craft is normally navigated, operating either:

a. .1 on VHF using DSC; this requirement may be fulfilled by the EPIRB prescribed by E3.511.c., either by installing the EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or

b. .2 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by E3.508.a9.,, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or

c. .3 if the craft is on voyages within coverage of MF coast stations equipped with DSC on MF using DSC; or

d. .4 on HF using DSC; or

e. .5 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by:

e.1. 5.1 an Inmarsat ship earth station; or

This requirement can be met by Inmarsat ship earth stations capable of two-way communications, such as Inmarsat-A and -B (resolution A.808(19)) or Inmarsat-C (resolution A.807(19) and MSC.68(68), annex 4) ship earth stations. Unless otherwise specified, this footnote applies to all requirements for an Inmarsat ship earth station prescribed by this chapter.

f. .5.2 the satellite EPIRB, required by E3.507.a9., either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

512. 14.8.2 The VHF radio installation, required by E3.508.a1., shall also be capable of transmitting and receiving general radio communications using radiotelephony.

514. 14.8.3 Craft engaged on voyages exclusively in sea area A1 may carry, in lieu of the satellite EPIRB required by E3.508.a9., an EPIRB which shall be:

.1 capable of transmitting a distress alert using DSC on VHF channel 70 and providing for locating by means of a radar transponder operating in the 9 GHz band;

a. .2 installed in an easily accessible position;

b. .3 ready to be manually released and capable of being carried by one person into a survival craft;

c. .4 capable of floating free if the craft sinks and of being automatically activated when afloat; and

d. .5 capable of being activated manually.

515. 14.9 Radio equipment: sea areas A1 and A2

516. 14.9.1 In addition to meeting the requirements of E3.520. every craft engaged on voyages beyond sea area A1, but remaining within sea area A2, shall be provided with:

a. .1 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

a.1. .1.1 2,187.5 kHz using DSC; and

a.2. .1.2 2,182 kHz using radiotelephony;

a.3. .2 a radio installation capable of maintaining a continuous DSC watch on the frequency 2,187.5 kHz which may be separate from, or combined with, that required by E3.516.a1.; and

a.4. .3 means of initiating the transmission of ship-to-shore distress alerts by a radio service other than MF, operating either:

a.5. 3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by E3.507.a9, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or

a.6. .3.2 on HF using DSC; or

a.7. .3.3 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by:

a.8. 3.3.1 the equipment specified in E3.518.b.; or

a.9. .3.3.2 the satellite EPIRB, required by E3.507.a9, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

517. 14.9.2 It shall be possible to initiate transmission of distress alerts by the radio installations specified in E3.518.b. and E3.516.a4.from the position from which the craft is normally navigated. It shall be possible to initiate transmission of distress alerts by the radio installations specified in E3.516.a. and E3.516.a4. from the position from which the craft is normally navigated.

a. 2,187.5 kHz using DSC; and .1.2 2,182 kHz using radiotelephony;

b. .2 a radio installation capable of maintaining a continuous DSC watch on the frequency 2,187.5 kHz which may be separate from, or combined with, that required by E3.516.a1.; and

c. .3 means of initiating the transmission of ship-to-shore distress alerts by a radio service other than MF, operating either:

d. 3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by E3.507.a9, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or

e. .3.2 on HF using DSC; or

f. .3.3 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by:

g. 3.3.1 the equipment specified in E3.518.b.; or

h. .3.3.2 the satellite EPIRB, required by E3.507.a9, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

518. 14.9.3 The craft shall, in addition, be capable of transmitting and receiving general radiocommunications using radiotelephony or direct-printing telegraphy by either:

a. .1 a radio installation operating on working frequencies in the bands between 1,605 kHz and 4,000 kHz or between 4,000 kHz and 27,500 kHz; this requirement may be fulfilled by the addition of this capability in the equipment required by E3.516.a.; or

b. .2 an Inmarsat ship earth station.

519. 14.10 Radio equipment: sea areas A1, A2 and A3

520. 14.10.1 In addition to meeting the requirements of 14.7, every craft engaged on voyages beyond sea areas A1 and A2, but remaining within sea area A3, shall, if it does not comply with the requirements of E3.520., be provided with:

a. .1 an Inmarsat ship earth station capable of:

b. .1.1 transmitting and receiving distress and safety communications using direct-printing telegraphy;

c. .1.2 initiating and receiving distress priority calls;

d. .1.3 maintaining watch for shore-to-ship distress alerts, including those directed to specifically defined geographical areas; and

e. .1.4 transmitting and receiving general radiocommunications, using either radiotelephony or direct-printing telegraphy;

f. .2 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:

g. .2.1 2,187.5 kHz using DSC; and

h. .2.2 2,182 kHz using radiotelephony;

i. .3 a radio installation capable of maintaining a continuous DSC watch on the frequency 2,187.5 kHz which may be separate from, or combined with, that required by E3.520.g.; and

j. .4 means of initiating the transmission of ship-to-shore distress alerts by a radio service operating either:

k. .4.1 through the polar orbiting service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by E3.507.a9., either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or

l. .4.2 on HF using DSC; or

m. .4.3 through the Inmarsat geostationary satellite service, by an additional ship earth station or by the satellite EPIRB required by E3.507.a9, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

n. 4.10.2 In addition to meeting the requirements of E3.507., every craft engaged on voyages beyond sea areas A1 and A2, but remaining within sea area A3, shall, if it does not comply with the requirements of E3.520., be provided with:

o. .1 an MF/HF radio installation capable of transmitting and receiving, for distress and safety purposes, on all distress and safety frequencies in the bands between 1,605 kHz and 4,000 kHz and between 4,000 kHz and 27,500 kHz:

p. .1.1 using DSC;

q. .1.2 using radiotelephony; and

r. .1.3 using direct-printing telegraphy;

s. .2 equipment capable of maintaining a DSC watch on 2,187.5 kHz, 8,414.5 kHz and on at least one of the distress and safety DSC frequencies 4,207.5 kHz, 6,312 kHz, 12,577 kHz or 1 6,804.5 kHz at any time, it shall be possible to select any of these DSC distress and safety frequencies. This equipment may be separate from, or combined with, the equipment required by E3.520.g;

t. .3 means of initiating the transmission of ship-to-shore distress alerts by a radiocommunication service other than HF operating either:

u. 3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB required by E3.508.a9., either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or

v. .3.2 through the Inmarsat geostationary satellite service, this requirement may be fulfilled by:

w. .3.2.1 an Inmarsat ship earth station; or

x. .3.2.2 the satellite EPIRB, required by E3.508.a9., either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; and

y. .4 in addition, the craft shall be capable of transmitting and receiving general radiocommunications using radiotelephony or direct-printing telegraphy by an MF/HF radio installation operating on working frequencies in the bands between 1,605 kHz and 4,000 kHz and between 4,000 kHz and 27,500 kHz. This requirement may be fulfilled by the addition of this capability in the equipment required by E3.520.g**.**

521. 14.10.3 It shall be possible to initiate transmission of distress alerts by the radio installations specified in E3.520.b. E3.520.a2, E3.520.d. E3.520.g. and E3.520.i. from the position from which the craft is normally navigated.

522. 14.11 Radio equipment: sea areas A1, A2, A3 and A4

523. 14.11.1 In addition to meeting the requirements of 14.7, craft engaged on voyages in all sea areas shall be provided with the radio installations and equipment required by E3.520. except that the equipment shall not be accepted as an alternative to that, which shall always be provided. In addition, craft engaged on voyages in all sea areas shall comply with the requirements of E3.521..

524. 14.12 Watches

525. 14.12.1 Every craft, while at sea, shall maintain a continuous watch:

a. .1 on VHF DSC channel 70, if the craft, in accordance with the requirements of E3.507., is fitted with a VHF radio installation;

b. .2 on the distress and safety DSC frequency 2,187.5 kHz, if the craft, in accordance with the requirements of E3.516.a3. or E3.530.a3., is fitted with an MF radio installation;

c. .3 on the distress and safety DSC frequencies 2,187.5 kHz and 8,414.5 kHz and also on at least one of the distress and safety DSC frequencies 4,207.5 kHz, 6,312 kHz, 12,577 kHz or 16,804.5 kHz, appropriate to the time of day and the geographical position of the craft, if the craft, in accordance with the requirements of E3.520.h. or E3.523., is fitted with an MF/HF radio installation. This watch may be kept by means of a scanning receiver; and

d. .4 for satellite shore-to-ship distress alerts, if the craft, in accordance with the requirements of E3.520.a1., is fitted with an Inmarsat ship earth station.

526. 14.12.2 Every craft, 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 craft is navigating.

527. 14.12.3 Until 1 February 2005, every craft, while at sea shall continue to maintain, when practicable, a continuous listening watch on VHF channel 16. This watch shall be kept at the position from which the craft is normally navigated.

600. 14.13 Sources of energy

601. 14.13.1 There shall be available at all times, while the craft is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used as part of a reserve source of energy for the radio installations.

602. 14.13.2 Reserve and emergency sources of energy shall be provided on every craft to supply radio installations, for the purpose of conducting distress and safety radiocommunications, in the event of failure of the craft’s main and emergency sources of electrical power. The reserve source of energy shall be capable of simultaneously operating the VHF radio installation required by E3.507.a6. and, as appropriate for the sea area or sea areas for which the craft is equipped, either the MF radio installation required by E3.518., the MF/HF radio installation required by E3.520.g. or E3.522. or the Inmarsat ship earth station required by E3.520.b. and any of the additional loads mentioned in E3.607. and E3.610. for a period of at least 1 h.

603. 14.13.3 The reserve source of energy shall be independent of the propelling power of the craft and the craft' s electrical system.

604. 14.13.4 Where, in addition to the VHF radio installation, two or more of the other radio installations referred to in

605. 14.13.2 can be connected to the reserve source or sources of energy, they shall be capable of simultaneously supplying, for the period specified in E3.602, the VHF radio installation and:

a. .1 all other radio installations which can be connected to the reserve source of energy at the same time; or

b. .2 whichever of the radio installations will consume the most power, if only one of the other radio installations can be connected to the reserve source of energy at the same time as the VHF radio installation.

607. 14.13.5 The reserve source of energy may be used to supply the electrical lighting required by E3.500.

608. 14.13.6 Where a reserve source of energy consists of a rechargeable accumulator battery or batteries:

a. .1 a means of automatically charging such batteries shall be provided which shall be capable of recharging them to minimum capacity requirements within 10 h; and

b. .2 the capacity of the battery or batteries shall be checked, using an appropriate method*, at intervals not exceeding 12 months, when the craft is not at sea.

One method of checking the capacity of an accumulator battery is to fully discharge and recharge the battery, using normal operating current and period (e.g. 10 h). Assessment of the charge condition can be made at any time, but it should be done without significant discharge of the battery when the craft is at sea.

609. 14.13.7 The siting and installation of accumulator batteries which provide a reserve source of energy shall be such as to ensure:

a. .1 the highest degree of service;

b. .2 a reasonable lifetime;

c. .3 reasonable safety;

d. .4 that the battery temperatures remain within the manufacturer' s specifications whether under charge or idle; and

e. .5 that when fully charged, the batteries will provide at least the minimum required hours of operation under all weather conditions.

610. 14.13.8 If an uninterrupted input of information from the craft' s navigational or other equipment to a radio installation required by this chapter is needed to ensure its proper performance, including the navigation receiver referred to in E4.900., means shall be provided to ensure the continuous supply of such information in the event of failure of the craft' s main or emergency source of electrical power.

700. 14.14 Performance standards

701. 14.14.1 All equipment to which this chapter applies shall be of a type approved by the Administration. Such equipment shall conform to appropriate performance standards not inferior to those adopted by the Organization*.

Refer to the following resolutions adopted by the Organization:

.1 Resolution A.525(13): Performance Standards for Narrow-Band Direct-Printing Telegraph Equipment for the Reception of Navigational and Meteorological Warnings and Urgent Information to Ships.

.2 Resolution A.694(17): General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids.

.3 Resolution A.808(19): Performance Standards for Ship Earth Stations Capable of Two-Way Communications, and resolution A.570(14), Type Approval of Ship Earth Stations.

.4 Resolutions A.803(19) and MSC.68(68), annex 1: Performance Standards for Shipborne VHF Radio installations Capable of Voice Communication and Digital Selective Calling.

.5 Resolutions A.804(19) and MSC.68(68), annex 2: Performance Standards for Shipborne MF Radio Installations Capable of Voice Communication and Digital Selective Calling.

.6 Resolutions A.806(19) and MSC.68(68), annex 3: Performance Standards for Shipborne MF/HF Radio Installations Capable of Voice Communication, Narrow-Band Direct Printing and Digital Selective Calling.

.7 Resolutions A.810(19) and MSC.56(66): Performance Standards for Float-Free Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating on 406 MHz (see also Assembly resolution A.696(17): Type Approval of Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating in the COSPAS-SARSAT System).

.8 Resolution A.802(19): Performance Standards for Survival Craft Radar Transponders for Use in Search and Rescue Operations.

.9 Resolution A.805(19): Performance Standards for Float-Free VHF Emergency Position-Indicating Radio Beacons.

.10 Resolutions A.807(19) and MSC.68(68), annex 4: Performance Standards for Inmarsat Standard-C Ship Earth Stations Capable of Transmitting and Receiving Direct-Printing Communications, and resolution A.570(14), Type Approval of Ship Earth Stations.

.11 Resolution A.664(16): Performance Standards for Enhanced Group Call Equipment.

.12 Resolution A.812(19): Performance Standards for Float-Free Satellite Emergency Position-indicating Radio Beacons Operating Through the Geostationary Inmarsat Satellite System on 1.6 GHz.

.13 Resolution A.662(16): Performance Standards for Float-Free Release and Activation Arrangements for Emergency Radio Equipment.

.14 Resolution A.699(17): System Performance Standard for the Promulgation and Co-ordination of Maritime Safety Information Using High-Frequency Narrow-Band Direct Printing.

.15 Resolution A.700(17): Performance Standards for Narrow-Band Direct-Printing Telegraph Equipment for the Reception of Navigational and Meteorological Warnings and Urgent Information to Ships (MSI) by HF.

.16 Resolution MSC.80(70): Recommendation on Performance Standards for on-scene (Aeronautical) Portable Two-Way VHF Radiotelephone Apparatus.

702. 14.15 Maintenance requirements

703. 14.15.1 Equipment shall be so designed that the main units can be replaced readily without elaborate recalibration or readjustment.

704. 14.15.2 Where applicable, equipment shall be so constructed and installed that it is readily accessible for inspection and on-board maintenance purposes.

705. 14.15.3 Adequate information shall be provided to enable the equipment to be properly operated and maintained, taking into account the recommendations of the Organization

706. Refer to the Recommendation on General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids, adopted by the Organization by resolution A.694(17).

707. 14.15.4 Adequate tools and spares shall be provided to enable equipment to be maintained.

708. 14.15.5 The Administration shall ensure that radio equipment required by this chapter is maintained to provide the availability of the functional requirements specified in E3.400. and to meet the recommended performance standards of such equipment

709. 14.15.6 On craft engaged on voyages in sea areas A1 and A2, the availability shall be ensured by using such methods as duplication of equipment, shore-based maintenance or at-sea electronic maintenance capability, or a combination of these, as may be approved by the Administration.

710. 14.15.7 On craft engaged on voyages in sea areas A3 and A4, the availability shall be ensured by using a combination of at least two methods, such as duplication of equipment, shore-based maintenance or at-sea electronic maintenance capability, as may be approved by the Administration, taking into account the recommendations of the Organization

Administrations should take account of the Radio Maintenance Guidelines for the Global Maritime Distress and Safety System (GMDSS) related to Sea Areas A3 and A4, adopted by the Organization by resolution A.702(17).

711. 14.15.8 However, for craft operating solely between ports where adequate facilities for shore-based maintenance of the radio installations are available and provided no journey between two such ports exceeds six hours, then the Administration may exempt such craft from the requirement to use at least two maintenance methods. For such craft at least one maintenance method shall be used.

712. 14.15.9 While all reasonable steps shall be taken to maintain the equipment in efficient working order to ensure compliance with all the functional requirements specified in E3.400., malfunction of the equipment for providing the general radiocommunications, required by E3.510., shall not be considered as making a craft unseaworthy or as a reason for delaying the craft in ports where repair facilities are not readily available, provided the craft is capable of performing all distress and safety functions.

713. 14.15.10 Satellite EPIRBs on all craft shall be:

a. .1 annually tested for all aspects of operational efficiency, with special emphasis on checking the emission on operational frequencies, coding and registration, at intervals within 3 months before the expiry date, or 3 months before or after the anniversary date, of the High-Speed Craft Safety Certificate; The test may be conducted on board the craft or at an approved testing station; and

b. .2 subject to maintenance at intervals not exceeding five years, to be performed at an approved shore-based maintenance facility.

800. 14.16 Radio personnel

801. 14.16.1 Every craft shall carry personnel qualified for distress and safety radiocommunication purposes to the satisfaction of the Administration. The personnel shall be holders of certificates specified in the Radio Regulations as appropriate, any one of whom shall be designated to have primary responsibility for radiocommunications during distress incidents.

802. 14.16.2 In passenger craft, at least one person qualified in accordance with sub-paragraph .1 shall be assigned to perform only radiocommunication duties during distress incidents.

803. 14.17 Radio records

A record shall be kept, to the satisfaction of the Administration and as required by the Radio Regulations, of all incidents connected with the radiocommunication service which appear to be of importance to safety of life at sea.

900. 14.18 Position-updating

All two-way communication equipment carried on board craft to which this chapter applies which is capable of automatically including the craft's position in the distress alert shall be automatically provided with this information from an internal or external navigation receiver, if either is installed. If such a receiver is not installed, the craft's position and the time that position was correct shall be manually updated at intervals not exceeding four hours, while the craft is underway, so that it is always ready for transmission by the equipment.

E5. OPERATING COMPARTMENT LAYOUT [Chapter 15

100. 15.1 Definitions

101. 15.1.1 "Operating area" is the operating compartment and those parts of the craft on both sides of, and close to, the operating compartment which extend to the craft' s side.

102. 15.1.2 "Workstation" is a position at which one or several tasks constituting a particular activity are carried out.

103. 15.1.3 "Docking workstation" is a place equipped with necessary means for docking the craft.

104. 15.1.4 "Primary controls" are all control equipment necessary for the safe operation of the craft when it is under way, including those required in an emergency situation.

200. 15.2 General

201. The design and layout of the compartment from which the crew operate the craft shall be such as to permit operating crew members to perform their duties in a correct manner without unreasonable difficulty, fatigue or concentration, and to minimize the likelihood of injury to operating crew members in both normal and emergency conditions.

202. 15.3 Field of vision from the operating compartment

203. 15.3.1 The operating station shall be placed above all other superstructures so that the operating crew are able to gain a view all round the horizon from the navigating workstation. Where it is impractical to meet the requirements of this paragraph from a single navigating workstation, the operating station shall be designed so that an all-round view of the horizon is obtained by using two navigating workstations combined or by any other means to the satisfaction of the Administration.

204. 15.3.2 Blind sectors shall be as few and as small as possible, and not adversely affect the keeping of a safe look-out from the operating station. If stiffeners between windows are to be covered, this shall not cause further obstruction inside the wheelhouse.

205. 15.3.3 The total arc of blind sectors from right ahead to 22.5° abaft the beam on either side shall not exceed 20°. Each individual blind sector shall not exceed 5°. The clear sector between two blind sectors shall not be less than 10°.

206. 15.3.4 Where it is considered necessary by the Administration, the field of vision from the navigating workstation shall permit the navigators from this position to utilize leading marks astern of the craft for track monitoring.

207. 15.3.5 The view of the sea surface from the operating station, when the navigators are seated, shall not be obscured by more than one craft length forward of the bow to 90° on either side irrespective of the craft' s draught, trim and deck cargo.

208. 15.3.6 The field of vision from the docking workstation, if remote from the operating station, shall permit one navigator to safely manoeuvre the craft to a berth.

300. 15.4 Operating compartment

301. 15.4.1 The design and arrangement of the operating compartment, including location and layout of the individual workstations, shall ensure the required field of vision for each function.

302. 15.4.2 The craft' s operating compartment shall not be used for purposes other than navigation, communications and other functions essential to the safe operation of the craft, its engines, passengers and cargo.

303. 15.4.3 The operating compartment shall be provided with an integrated operating station for command, navigation, manoeuvring and communication and so arranged that it can accommodate those persons required to navigate the craft safely

304. 15.4.4 The arrangement of equipment and means for navigation, manoeuvring, control, communication and other essential instruments shall be located sufficiently close together to enable both the officer in charge and any assisting officer to receive all necessary information and to use the equipment and controls, as required, while they are seated. If necessary, the equipment and means serving these functions shall be duplicated.

305. 15.4.5 If a separate workstation for supervision of engine performance is placed in the operating compartment, the location and use of this workstation shall not interfere with the primary functions to be performed in the operating station.

306. 15.4.6 The location of the radio equipment shall not interfere with the primary navigational functions in the operating station.

307. 15.4.7 The design and layout of the compartment from which the crew operate the craft and the relative

positions of the primary controls shall be assessed against the essential operational manning level. Where minimum manning levels are proposed, the design and layout of the primary and communication controls shall form an integrated operational and emergency control centre from which the craft can be controlled under all operational and emergency events by the operating crew without the necessity for any crew member to vacate the compartment.

308. 15.4.8 The relative positions of the primary controls and the seats shall be such that each operating crew member, with the seat suitably adjusted and without prejudicing compliance with E5.200., can:

a. .1 without interference, produce full and unrestricted movement of each control both separately and with all practical combinations of movement of other controls; and

b. .2 at all workstations, exert adequate control forces for the operation to be performed.

309. 15.4.9 When a seat at a station from which the craft may be operated has been adjusted so as to suit the occupant, subsequent change of seat position to operate any control shall not be acceptable.

310. 15.4.10 In craft where the Administration considers the provision of a safety belt necessary for use by the operating crew, it shall be possible for those operating crew members, with their safety belts correctly worn, to comply with E5.304. except in respect of controls which it can be shown will only be required on very rare occasions and which are not associated with the need for safety restraint.

311. 15.4.11 The integrated operating station shall contain equipment which provides relevant information to enable the officer in charge and any assisting officer to carry out navigational and safety functions safely and efficiently.

314. 15.4.12 Adequate arrangements shall be made to prevent passengers from distracting the attention of the operating crew.

400. 15.5 Instruments and chart table

401. 15.5.1 Instruments, instrument panels and controls shall be permanently mounted in consoles or other appropriate places, taking into account operation, maintenance and environmental conditions. However, this shall not prevent the use of new control or display techniques, provided the facilities offered are not inferior to recognized standards.

402. 15.5.2 All instruments shall be logically grouped according to their functions. in order to reduce to a minimum the risk of confusion, instruments shall not be rationalized by sharing functions or by inter-switching.

403. 15.5.3 Instruments required for use by any member of the operating crew shall be plainly visible and easily read:

a. .1 with minimum practicable deviation from his normal seating position and line of vision; and

b. .2 with the minimum risk of confusion under all likely operating conditions.

404. 15.5.4 Instruments essential for the safe operation of the craft shall be clearly marked with any limitation if this information is not otherwise clearly presented to the operating crew. The instrument panels forming the emergency control for the launching of liferafts and the monitoring of the fire-fighting systems shall be in separate and clearly defined positions within the operating area.

405. 15.5.5 The instruments and controls shall be provided with means for screening and dimming in order to minimize glare and reflections and prevent them being obscured by strong light.

406. 15.5.6 The surfaces of console tops and instruments shall have dark glare-free colours.

407. 15.5.7 Instruments and displays providing visual information to more than one person shall be located for easy viewing by all users concurrently. If this is not possible, the instrument or display shall be duplicated.

408. 15.5.8 If considered necessary by the Administration, the operating compartment shall be provided with a suitable table for chart work. There shall be facilities for lighting the chart. Chart-table lighting shall be screened.

500. **15.6 Lighting**

501. 15.6.1 A satisfactory level of lighting shall be available to enable the operating personnel to adequately perform all their tasks both at sea and in port, by day and night. There shall be only a limited reduction in the illumination of essential instruments and controls under likely system fault conditions.

502. 15.6.2 Care shall be taken to avoid glare and stray image reflection in the operating area environment. High contrast in brightness between work area and surroundings shall be avoided. Non-reflective or matt surfaces shall be used to reduce indirect glare to a minimum.

503. 15.6.3 A satisfactory degree of flexibility within the lighting system shall be available to enable the operating personnel to adjust the lighting intensity and direction as required in the different areas of the operating compartment and at individual instruments and controls.

504. 15.6.4 Red light shall be used to maintain dark adaptation whenever possible in areas or on items of equipment requiring illumination in the operational mode, other than the chart table.

505. 15.6.5 During hours of darkness, it shall be possible to discern displayed information and control devices.

506. 15.6.6 Reference is made to additional requirements on lighting in E5.600 and E5.700.

600. 15.7 Windows

601. 15.7.1 Divisions between windows, located in the front, on the sides and in the doors, shall be kept to a minimum. No division shall be installed immediately forward of the operating stations.

602. 15.7.2 Administrations shall be satisfied that a clear view through the operating compartment windows is provided at all times regardless of weather conditions. The means provided for maintaining the windows in a clear condition shall be so arranged that no reasonably probable single failure can result in a reduction of the cleared field of vision such as to interfere seriously with the ability of the operating crew to continue the operation and bring the craft to rest.

603. 15.7.3 Arrangements shall be provided so that the forward view from operating stations is not adversely affected by solar glare. Neither polarized nor tinted window glass shall be fitted.

604. 15.7.4 Operating compartment windows shall be angled to reduce unwanted reflection.

605. 15.7.5 The windows shall be made of material which will not break into dangerous fragments if fractured.

700. 15.8 Communication facilities

701. 15.8.1 Such means as are necessary shall be provided to enable the crew to communicate between, and have access to, each other and with other occupants of the craft in both normal and emergency conditions.

702. 15.8.2 Means to communicate between the operating compartment and spaces containing essential machinery, including any emergency steering position, irrespective of whether the machinery is remotely or locally controlled, shall be provided.

703. 15.8.3 Means for making public address and safety announcements from control stations to all areas to which passengers and crew have access shall be provided.

704. 15.8.4 Provisions shall be made for means to monitor, receive and transmit radio safety messages at the operating compartment.

800. 15.9 Temperature and ventilation

801. The operating compartment shall be equipped with adequate temperature and ventilation control systems.

802. 15.10 Colours

803. The surface materials inside the operating compartment shall have a suitable colour and finish to avoid reflections.

900. 15.11 Safety measures

901. The operating area shall be free of physical hazard to the operating personnel and have non-skid flooring in dry and wet conditions and adequate handrails. Doors shall be fitted with devices to prevent them moving, whether they are open or closed.

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