

CHAPTER 14

RADIOCOMMUNICATIONS

EU Directive on Electromagnetic Compatibility (2004/108/EC)

Electrical and electronic equipment fitted to Community Craft that may either generate or be affected by electromagnetic disturbance shall meet the requirements of EU Directive 2004/108/EC, as amended. Equipment complying with this directive should have an EC mark or CE marking in accordance with EU Directives 2004/108/EC or 93/68/EEC (with Corrigendum), as amended.

EU Directive on Electrical Equipment designed for use within certain voltage limits (2006/95/EC)

Electrical Equipment designed for use with a voltage rating of between 50 and 1000 volts for alternating current and between 75 and 1500 volts for direct current shall meet the requirements of EU Directive 2006/95/EC, except for specialised electrical equipment, for use on ships, which comply with the safety provisions drawn up by international bodies in which the Member States participate.

Reference should be made to the Instruction for Surveyors - Radio Installation on GMDSS ships (MSIS 5).

14.1 Application

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

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 safety purposes, as contained in the relevant agreement between Canada and the United States.

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.

14.2 Terms and definitions

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

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

- .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).
- .4 "Direct-printing" telegraphy means automated telegraphy techniques which comply with the relevant recommendations of the International Telecommunication Union Radiocommunication Sector (ITU-R).
- .5 "General radiocommunications" means operational and public correspondence traffic other than distress, urgency and safety messages, conducted by radio.
- .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.
- .7 "Inmarsat" means the Organization established by the Convention on the International Maritime Satellite Organization (Inmarsat) adopted on 3 September 1976.
- .8 "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.*

* Refer to the NAVTEX Manual approved by the Organisation.

- .9 "Locating" means the finding of the ships, craft, aircraft, units or persons in distress.
- .10 "Maritime safety information" means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships and craft.
- .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.
- .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.
- .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*.

* 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).

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

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.

14.3 Exemptions

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:

- .1 such craft comply with the functional requirements of 14.5; and
- .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.

14.3.2 An exemption may be granted under 14.3.1 only:

- .1 if the conditions affecting safety are such as to render the full application of 14.7 to 14.11 unreasonable or unnecessary; or
- .2 in exceptional circumstances, for a single voyage outside the sea area or sea areas for which the craft is equipped.

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 14.3.1 and 14.3.2 during the previous calendar year and giving the reasons for granting such exemptions.

14.4 Global Maritime Distress and Safety System Identities

14.4.1 This section applies to all craft on all voyages.

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.

14.5 Functional requirements

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

- .1 except as provided in 14.8.1.1 and 14.10.1.4.3, of transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;
- .2 of receiving shore-to-ship distress alerts;
- .3 of transmitting and receiving ship-to-ship distress alerts;
- .4 of transmitting and receiving search and rescue co-ordinating communications;
- .5 of transmitting and receiving on-scene communications;
- .6 of transmitting and, as required by 13.5, receiving signals for locating;*

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

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

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

- .8 of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks subject to 14.15.8; and
- .9 of transmitting and receiving bridge-to-bridge communications.

14.6 Radio installations

14.6.1 Every craft shall be provided with radio installations capable of complying with the functional requirements prescribed by 14.5 throughout its intended voyage and, unless exempted under 14.3, complying with the requirements of 14.7 and, as appropriate for the sea area or areas through which it will pass during its intended voyage, the requirements of either 14.8, 14.9, 14.10 or 14.11.

14.6.2 Every radio installation shall:

- .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;
- .2 be so located as to ensure the greatest possible degree of safety and operational availability;
- .3 be protected against harmful effects of water, extremes of temperature and other adverse environmental conditions;
- .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

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

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 radiocommunications from the wings of the navigating bridge. Portable VHF equipment may be used to meet the latter provision.

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 radiocommunication 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.

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

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.

14.7 Radio equipment: general

14.7.1 Every craft shall be provided with:

- .1 a VHF radio installation capable of transmitting and receiving:
 - .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
 - .1.2 radiotelephony on the frequencies 156.300 MHz (channel 6), 156.650 MHz (channel 13) and 156.800 MHz (channel 16);
- .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;
- .3 a radar transponder capable of operating in the 9 GHz band, which:

The following new text for 14.7.1.3 is expected to enter into force on 1 January 2010:

- .3 a search and rescue locating device which:

(Res MSC.260(84))

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

.3.2 may be one of those required by 8.2.1.2 for a survival craft;

.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;

.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 SafetyNET receivers under 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).

.6 subject to the provisions of 14.8.3, a satellite emergency position indicating radio beacon (satellite EPIRB)* which shall be:

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

.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;

SOLAS and the HSC Code is awaiting update: Inmarsat E (EPIRB) is a discontinued service since 1 December 2006 therefore deleted. See MSC/Circ.1171 "Closure of Inmarsat – E service by Inmarsat Ltd." which refers to the withdrawal of Inmarsat E EPIRBs. Assume that in .6.1 above that the 2nd part of sentence is removed (after "406 MHz band") from the HSC Code.

.6.2 installed in an easily accessible position;

The EPIRB should be installed in the vicinity of the navigation bridge, i.e. on the wings of the navigation bridge. Access via vertical ladder should not be accepted. A location on the top of the wheelhouse may be accepted to fulfil the requirement if accessible by stairs. (SOLAS 1974, as amended, Chapter IV/7 and Com/circ. 105)

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

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

.6.5 capable of being activated manually.

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.

Approved equipment may be of a fixed type or a hand held type. Hand held equipment should be provided with a headset and microphone.

14.8 Radio equipment: sea area A1

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:

- .1 on VHF using DSC; this requirement may be fulfilled by the EPIRB prescribed by 14.8.3, either by installing the EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or
- .2 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or
- .3 if the craft is on voyages within coverage of MF coast stations equipped with DSC on MF using DSC; or
- .4 on HF using DSC; or
- .5 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by:
 - .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 applies to all requirements for an Inmarsat ship earth station prescribed by this chapter.

Note: When considering Resolution A.808(19), A.694(17) and MSC.120(74)) should also be referred to.

SOLAS and the HSC Code is awaiting update: Inmarsat - A is a discontinued service since 31 December 2007. See MSC/Circ.1076 "Future Withdrawal of Inmarsat - A service by Inmarsat Ltd.". Assume that the wording of the HSC Code footnote (above) does not refer to Inmarsat A.*

- .5.2 the satellite EPIRB, required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

14.8.2 The VHF radio installation, required by 14.7.1.1, shall also be capable of transmitting and receiving general radiocommunications using radiotelephony.

14.8.3 Craft engaged on voyages exclusively in sea area A1 may carry, in lieu of the satellite EPIRB required by 14.7.1.6, 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;

- .2 installed in an easily accessible position;
- .3 ready to be manually released and capable of being carried by one person into a survival craft;
- .4 capable of floating free if the craft sinks and of being automatically activated when afloat; and
- .5 capable of being activated manually.

14.9 Radio equipment: sea areas A1 and A2

14.9.1 In addition to meeting the requirements of 14.7, every craft engaged on voyages beyond sea area A1, but remaining within sea area A2, shall be provided with:

- .1 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:
 - .1.1 2,187.5 kHz using DSC; and
 - .1.2 2,182 kHz using radiotelephony;
- .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 14.9.1.1.1; and
- .3 means of initiating the transmission of ship-to-shore distress alerts by a radio service other than MF, operating either:
 - .3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or
 - .3.2 on HF using DSC; or
 - .3.3 through the Inmarsat geostationary satellite service; this requirement may be fulfilled by:
 - .3.3.1 the equipment specified in 14.9.3.2; or
 - .3.3.2 the satellite EPIRB, required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

SOLAS and the HSC Code is awaiting update: Inmarsat E (EPIRB) is a discontinued service since 1 December 2006 therefore deleted. See MSC/Circ.1171 "Closure of Inmarsat – E service by Inmarsat Ltd." which refers to the withdrawal of Inmarsat E EPIRBs. Assume .3.3.2 is removed from the HSC Code.

14.9.2 It shall be possible to initiate transmission of distress alerts by the radio installations specified in 14.9.1.1 and 14.9.1.3 from the position from which the craft is normally navigated.

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

- .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 14.9.1.1; or
- .2 an Inmarsat ship earth station.

14.10 Radio equipment: sea areas A1, A2 and A3

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 14.10.2, be provided with:

- .1 an Inmarsat ship earth station capable of:
 - .1.1 transmitting and receiving distress and safety communications using direct-printing telegraphy;
 - .1.2 initiating and receiving distress priority calls;
 - .1.3 maintaining watch for shore-to-ship distress alerts, including those directed to specifically defined geographical areas; and
 - .1.4 transmitting and receiving general radiocommunications, using either radiotelephony or direct-printing telegraphy;
- .2 an MF radio installation capable of transmitting and receiving, for distress and safety purposes, on the frequencies:
 - .2.1 2,187.5 kHz using DSC; and
 - .2.2 2,182 kHz using radiotelephony;
- .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 14.10.1.2.1; and
- .4 means of initiating the transmission of ship-to-shore distress alerts by a radio service operating either:
 - .4.1 through the polar orbiting service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB, required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or
 - .4.2 on HF using DSC; or

- .4.3 through the Inmarsat geostationary satellite service, by an additional ship earth station. or by the satellite EPIRB required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

SOLAS and the HSC Code is awaiting update: Inmarsat E (EPIRB) is a discontinued service since 1 December 2006 therefore deleted. See MSC/Circ.1171 "Closure of Inmarsat – E service by Inmarsat Ltd." which refers to the withdrawal of Inmarsat E EPIRBs. Assume .4.3 above that the 2nd part of sentence is removed (after "ship earth station") from the HSC Code.

14.10.2 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 14.10.1, be provided with:

- .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:
 - .1.1 using DSC;
 - .1.2 using radiotelephony; and
 - .1.3 using direct-printing telegraphy;
- .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 16,804.5 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 14.10.2.1;
- .3 means of initiating the transmission of ship-to-shore distress alerts by a radiocommunication service other than HF operating either:
 - .3.1 through the polar orbiting satellite service on 406 MHz; this requirement may be fulfilled by the satellite EPIRB required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; or
 - .3.2 through the Inmarsat geostationary satellite service, this requirement may be fulfilled by:
 - .3.2.1 an Inmarsat ship earth station; or
 - .3.2.2 the satellite EPIRB, required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated; and

SOLAS and the HSC Code is awaiting update: Inmarsat E (EPIRB) is a discontinued service since 1 December 2006 therefore deleted. See MSC/Circ.1171 "Closure of Inmarsat – E service by Inmarsat Ltd." which refers to the withdrawal of Inmarsat E EPIRBs. Assume .3.3.2 is removed from the HSC Code.

- .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 14.10.2.1.

14.10.3 It shall be possible to initiate transmission of distress alerts by the radio installations specified in 14.10.1.1, 14.10.1.2, 14.10.1.4, 14.10.2.1 and 14.10.2.3 from the position from which the craft is normally navigated.

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

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 14.10.2, except that the equipment required by 14.10.2.3.2 shall not be accepted as an alternative to that required by 14.10.2.3.1, which shall always be provided. In addition, craft engaged on voyages in all sea areas shall comply with the requirements of 14.10.3.

14.12 Watches

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

- .1 on VHF DSC channel 70, if the craft, in accordance with the requirements of 14.7.1.2, is fitted with a VHF radio installation;
- .2 on the distress and safety DSC frequency 2,187.5 kHz, if the craft, in accordance with the requirements of 14.9.1.2 or 14.10.1.3, is fitted with an MF radio installation;
- .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 14.10.2.2 or 14.11, is fitted with an MF/HF radio installation. This watch may be kept by means of a scanning receiver; and
- .4 for satellite shore-to-ship distress alerts, if the craft, in accordance with the requirements of 14.10.1.1, is fitted with an Inmarsat ship earth station.

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.

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.

SOLAS and the HSC Code is awaiting update: Assume that 14.12.3 should read "Every ship, while at sea, is required to maintain watches (Regulation on Watches in Chapter IV of SOLAS, 1974, as amended). Continuous watchkeeping is required on VHF DSC channel 70 and also 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.”
(COMSAR 8/18 para 3.9)*

14.13 Sources of energy

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.

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 14.7.1.1 and, as appropriate for the sea area or sea areas for which the craft is equipped, either the MF radio installation required by 14.9.1.1, the MF/HF radio installation required by 14.10.2.1 or 14.11 or the Inmarsat ship earth station required by 14.10.1.1 and any of the additional loads mentioned in 14.13.5 and 14.13.8 for a period of at least 1 h.

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

14.13.4 Where, in addition to the VHF radio installation, two or more of the other radio installations referred to in 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 14.13.2, the VHF radio installation and:

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

14.13.5 The reserve source of energy may be used to supply the electrical lighting required by 14.6.2.4.

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

- .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
- .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.

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

- .1 the highest degree of service;

- .2 a reasonable lifetime;
- .3 reasonable safety;
- .4 that the battery temperatures remain within the manufacturer's specifications whether under charge or idle; and
- .5 that when fully charged, the batteries will provide at least the minimum required hours of operation under all weather conditions.

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 14.18, 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.

14.14 Performance standards

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 Assembly of the Organization:

Resolution A.525(13) *as amended by MSC.148(77)*: Performance standards for narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships.

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.

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. *Refer also to A.694(17) and MSC.149(77)*.

Resolution A.803(19) and MSC.68(68), annex 1: Performance standards for shipborne VHF radio installations capable of voice communication and digital selective calling.

Resolution A.804(19) and MSC.68(68), annex 2: Performance standards for shipborne MF radio installations capable of voice communication and digital selective calling.

Resolution 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.

Resolution A.810(19), *as amended by MSC.56(66) and MSC.120(74)*, annex: 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).

Resolution A.802(19), *as amended by MSC.247(83)*: Performance standards for survival craft radar transponders for use in search and rescue operations.

Resolution A.805(19): Performance standards for float-free VHF emergency position-indicating radio beacons.

Resolution 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.

Resolution A.664(16): Performance standards for enhanced group call equipment.

Resolution A.812(19): Performance standards for float-free satellite emergency position-indicating radio beacons operating through the geostationary INMARSAT satellite system of 1.6 GHz.

Resolution A.662(16): Performance standards for float-free release and activation arrangements for emergency radio equipment. *Refer also to A.812(19)*

Resolution A.699(17): System performance standard for the promulgation and co-ordination of maritime safety information using high-frequency narrow-band direct-printing.

Resolution A.700(17): Performance standards for narrow-band direct-printing telegraphy equipment for the reception of navigational and meteorological warnings and urgent information to ships (MSI) by HF. *Refer also to A.420(XI).*

Resolution MSC.80(70): Recommendation on performance standards for on-scene (aeronautical) portable two-way VHF radiotelephone apparatus.

Note *Res. A.699(17) applies only to Administrations.*

14.15 Maintenance requirements

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

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

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.*

* 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).

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

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 14.5 and to meet the recommended performance standards of such equipment.

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.

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).

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 6 h, 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.

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 14.5, malfunction of the equipment for providing the general radiocommunications, required by 14.8, 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.

14.15.10 Satellite EPIRBs on all craft shall be:

.1 annually tested for all aspects of operational efficiency, with special emphasis on checking the emission on operational frequencies, coding and registration, at intervals as specified below:

.1 on passenger craft, within 3 months before the expiry date of the High-Speed Craft Safety Certificate; and

.2 on cargo craft, 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

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

14.16 Radio personnel

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.

14.16.2 In passenger craft, at least one person qualified in accordance with 14.16.1 shall be assigned to perform only radiocommunication duties during distress incidents.

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.

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 4 h, while the craft is underway, so that it is always ready for transmission by the equipment.