



RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER

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Re: amendments to the Rules for the Equipment of Sea-Going Ships, 2023, ND No.2-020101-171-E (Part IV "Radio Equipment")

The text of the part has been revised in connection with the past modernization of GMDSS and the replacement of the text of Chapter IV "Radiocommunications" of SOLAS-74.

Instructions on application:

Apply the provisions of the Circular Letter during review and approval of the technical documentation on ships contracted for construction or conversion on or after 01.01.2024, in the absence of a contract, on ships the keels of which are laid, or which are at a similar stage of construction on or after 01.01.2024, as well as during review and approval of the technical documentation on radio equipment requested for review on or after 01.01.2024.

Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments

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Information on amendments introduced by the Circular Letter

PART IV. RADIO EQUIPMENT

Amended paras/chapters/sections	Item(s)/Type(s) of supervision and their particulars	Information on amendments	Remarks
Part IV	Ships under construction and in service Radio equipment	<p>Due to the past modernization of GMDSS and the replacement of text of SOLAS-74 Chapter IV "Radiocommunications", the Part has been amended as follows:</p> <ul style="list-style-type: none"> - the definitions have been revised; - Table 2.1.1 "Minimum requirements for equipment of ships depending on the area of navigation" has been revised; - para 2.3.4 referring to the operating time of the reserve source of electrical power has been reworded; - requirements of chapter 2.5 for the composition of the duplicated equipment have been reworded; - requirements of para 3.3.13 for the additional arrangement of passenger ships have been reworded; - due to the transfer of requirements for the radio equipment of shipborne life-saving appliances from Part III into Part IV of these Rules, chapter 3.6 has been largely revised; - para 3.7.3 referring to the power supply of the radio equipment distribution board has been reworded; 	<p>IMO resolutions: MSC.496(105) MSC.508(105) MSC.510(105) MSC.511(105) MSC.512(105) MSC.513(105) MSC.515(105) MSC.516(105) MSC.517(105)</p> <p>IMO circulars: COMSAR.1/Circ.32/Rev. 2 and MSC.1/Circ.1676</p> <p>IACS UI SC298</p>

Amended paras/chapters/sections	Item(s)/Type(s) of supervision and their particulars	Information on amendments	Remarks
		<ul style="list-style-type: none"> - requirements of chapters 4.2 and 4.3 for the provision and arrangement of antennas have been added; - due to the revision of all the IMO resolutions relevant to the GMDSS modernization, the Table of Appendix 3 "The list of IMO resolutions and circulars, ITU recommendations, IEC and ISO standards, other external documents applicable in the performance of work on type approval of shipborne radio equipment" has been replaced by the new table; - Appendix 4 "Examples of possible minimum equipment of a ship depending on the navigation area" has been introduced 	

PART IV. RADIO EQUIPMENT

The **Part** is replaced by the following text:

"1 GENERAL

1.1 APPLICATION

1.1.1 The requirements of the present Part of the Rules apply to:

- .1** passenger and cargo ships not engaged in international voyages;
- .2** cargo ships of gross tonnage less than 300;
- .3** fishing vessels;
- .4** non-self-propelled ships with people on board.

1.1.2 The requirements of the present Part of the Rules apply to radio equipment which is subject to survey by the Register and intended for installation on board ships.

1.1.3 The present Part of the Rules defines the technical requirements which the radio equipment shall comply with and specifies the list of such equipment, its arrangement on board and the maintenance and repair methods.

1.1.4 The requirements of the present Part of the Rules apply to the ships and radio equipment whose technical documentation was submitted to the Register for review and approval after the entry into force of the Rules.

Ships under construction and the radio equipment whose technical documentation was approved by the Register prior to the entry into force of the Rules shall be subject to the Rules in force at the time of approval of the documentation unless specified otherwise in the relevant sections and chapters of the Rules.

1.1.5 If the Maritime Administration (MA) of the ship's flag gives additional instructions on outfitting ships with radio equipment, then in case of discrepancy with the provisions of these Rules, the instructions of the MA of the ship's flag shall be applied.

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

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 Definitions and explanations relating to general and technical terminology of the Rules are given in Part I "Classification" of the Rules for the Classification and Construction of Sea-Going Ships, in Part I "General Regulations for Technical Supervision" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships and in Radio Regulations accordingly.

1.2.2 For the purpose of the present Part of the Rules, the following definitions have been adopted.

Carrier power of a radio transmitter is the average power supplied to the antenna transmission line by a transmitter during high frequency cycle under conditions of no modulation.

This definition does not apply to pulse modulated emissions.

Digital selective calling (DSC) is 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 (ITU).

EMC means electromagnetic compatibility.

Emergency position-indicating radio beacon (EPIRB) is a transmitter operating in the frequency band 406.0 — 406.1 MHz capable of transmitting a distress alert via satellite to a rescue coordination centre and transmitting signals for on-scene locating.

EMI means electromagnetic interference.

Enhanced group calling (EGC) is the system for broadcast transmit of urgency, distress and safety messages by mobile satellite communication system through a recognized mobile satellite service.

EPFS means electronic positioning fixing system that can be either global GNSS-based or local, covering a certain area.

Fishing vessel is a vessel used directly for catching or for catching and processing the catch (fish, whales, seals, walrus or other living resources of the sea).

Frequencies:

MF — medium frequencies, 300 — 3000 kHz;

HF — high frequencies, 3 — 30 MHz;

VHF — very high frequencies, 30 — 300 MHz;

UHF — ultrahigh frequencies, 300 — 3000 MHz.

Global Maritime Distress and Safety System (GMDSS) is system performing the functions specified in regulation 4.1.1 of Chapter IV "Radiocommunications" of the International Convention for the Safety of Life at Sea (SOLAS-74).

Global maritime distress and safety system (GMDSS) identities means information which may be transmitted to uniquely identify the ship or its associated rescue boats and survival craft. These identities are the ship's call sign, Maritime Mobile Service Identity (MMSI), EPIRB hexadecimal identity, recognized mobile satellite service identities and equipment serial numbers.

Interference is the influence of unwanted energy on reception in the radio communication system resulting in impaired quality, errors or loss of information that could have been avoided in the absence of influence of such unwanted energy.

International NAVTEX Service is the coordinated broadcast and automatic reception on 518 kHz of maritime safety information by means of narrow-band direct-printing telegraphy using the English language.

Maritime safety information (MSI) is navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to ships.

Mean power of radio transmitter is the power supplied to the antenna transmission line by a transmitter averaged over the time sufficiently long compared with the lowest frequency encountered in the modulation under normal operating conditions.

MF radio installation means MF radiotelephone station with DSC and a DSC radio watch receiver on a frequency of 2187,5 kHz.

MF/HF radio installation means MF/HF radiotelephone station with DSC and MF/HF radio watch receiver.

MSI/SAR receiver is a Maritime Safety Information and Safety-and-Rescue related information receiver.

Narrow-band direct-printing telegraphy (NBDP) is a communication technique using automated telegraphy facilities which comply with the relevant recommendations of the International Telecommunication Union (ITU).

Navigation bridge is the position from which the ship is normally navigated.

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

National NAVTEX service means the broadcast and automatic reception of maritime safety information by means of narrow-band direct-printing telegraphy using frequencies and languages as decided by the Administrations concerned.

Peak envelope power of radio transmitter is the power supplied to the antenna transmission line by a transmitter averaged during one radio frequency cycle at the highest crest of the modulation envelope under normal climatic conditions.

Rated power of radio transmitter is the minimum power within the frequency range of the transmitter transferred to the antenna or to the artificial antenna under normal operating and climatic conditions.

Recognized mobile satellite service (RMSS) is any service which operates through a satellite system and is recognized by the Organization, for use in the global maritime distress and safety system (GMDSS).

RMSS SES means Recognized Mobile Satellite Service Ship Earth Station.

Sea area A1 is an area within the radio- telephone coverage of at least one VHF coast station in which continuous DSC alerting is available.

Sea area A2 is an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available.

Sea area A3 is an area, excluding sea areas A1 and A2, within the coverage of a Recognized Mobile Satellite Service (RMSS) supported by Ship Earth Station (SES) installed on board in which continuous alerting is available.

Sea area A4 is an area outside sea areas A1, A2 and A3.

Ship Earth Station (SES) is a mobile earth station of the Maritime Mobile Satellite Service fitted on board a ship.

VHF radio installation means VHF radiotelephone station with DSC and a DSC radio watch receiver on channel 70.

1.3 SCOPE OF SURVEY

1.3.1 General provisions for the procedure of survey of the radio equipment, as well as the requirements for the technical documentation to be submitted for review to the Register, and information on documents for radio equipment issued by the Register, are set out in General Regulations for the Classification and Other Activity, Part I "General Regulations for "Technical Supervision" and Part II "Technical Documentation" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships and Part I "General".

1.3.2 The Register carries out technical supervision during manufacture, installation and operation of the shipboard radio equipment in accordance with the Register nomenclature of items of technical supervision.

1.3.3 In the technical supervision during manufacture of shipborne radio equipment, the Register shall perform its activities in accordance with the requirements of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

1.3.4 When new radio equipment is fitted or outdated (broken-down and unrepairable) equipment is replaced on ships in service, the installation technical design and working drawings shall be submitted to the Register for review prior to the commencement of survey of the radio equipment.

The technical design shall contain information on the sea areas where the ship is intended to operate and on the radio equipment maintenance and repair methods.

After the approval of the technical design and working drawings, the radio equipment fitted on board shall be surveyed and tested in operation.

2 REQUIREMENTS FOR RADIO EQUIPMENT

2.1 LIST OF RADIO EQUIPMENT

2.1.1 The minimum list of radio equipment, unless otherwise provided by the Administration of the ship's flag, is determined by the areas of navigation in compliance with [Table 2.1.1](#):

according to GMDSS sea areas: A1; A2; A3; A4;

according to port water areas: on inner road; on outer road.

Table 2.1.1

Minimum requirements for equipment of ships depending on the area of navigation

Nos	Equipment	RS nomenclature code	All ships	Sea areas				Water area of a port	
				A1	A2	A3	A4	Inner road	Outer road
Basic equipment									
1	VHF radio installation	04120000MK	X					1	1
2	MF radio installation	04130000MK			X¹	X¹			
3	MF/HF radio installation	04140000MK					X		
4	RMSS SES	04150300MK 04150000MK				X			
5	MSI and SAR receiver	04180000MK 04190000MK 04140010MK	X²						
6	Float-free EPIRB	04160000MK	X						1
7	Ship's and survival craft search and rescue locating devices	04220000MK 04220100MK	X³					1	1
8	Two-way VHF radiotelephone apparatus	04230000MK 04230001MK	X⁴					1	1
Duplicated equipment (if applicable)									
9	VHF radio installation ⁵	04120000MK	X⁵						
10	MF radio installation ⁵	04130000MK			X^{1, 5}				
11	MF/HF radio installation	04140000MK					X		
12	RMSS SES	04150300MK 04150000MK				X⁶			
<p>¹ MF/HF radio installation may be used.</p> <p>² NAVTEX receiver is mandatory if the ship is engaged on voyages in any area covered by the international NAVTEX service. HF MSI/SAR receiver or EGC receiver providing MSI/SAR receipt in the areas of ship operation is mandatory, if the ship is engaged on voyages in areas not covered by the international NAVTEX service.</p> <p>³ The ship shall be equipped at least with one ship's and survival craft search and rescue locating devices (radar SART or AIS-SART).</p> <p>⁴ The ship shall be equipped at least with two sets of two-way VHF radiotelephone apparatus.</p> <p>⁵ DSC watch-keeping receiver is not required.</p> <p>⁶ Duplication may be performed by means of RMSS SES with coverage area equal or higher than the main RMSS SES or by means of MF/HF radio installation.</p>									

2.1.2 Radio equipment not specified in this Section may be accepted for installation on board ships as additional equipment, provided that its operation does not affect the operation of the main radio equipment or impair safety of navigation.

2.1.3 Every ship which after completion of construction shall undertake a single voyage to the place of its supplementary outfitting may be exempted from the requirement for installation of the full complement of the statutory radio equipment, if it is capable of transmitting ship-to-shore distress alerts by at least two separate and independent facilities, each using different types of radio communication.

The full complement of the radio equipment shall be approved at the review of the draft passage of the ship.

2.1.4 Every ship, while at sea shall maintain a continuous watch:

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

.2 on the distress and safety DSC frequency 2187,5 kHz, if the ship, in accordance with the requirements of the Rules, is fitted with an MF radio installation;

.3 on the distress and safety DSC frequencies 2187,5 kHz and 8414,5 kHz and also on one of the distress and safety DSC frequencies 4207,5 kHz, 6312 kHz, 12577 kHz or 16804,5 kHz, appropriate to the time of the day and the geographical position of the ship, if the ship, in accordance with the requirements of the Rules, is fitted with an MF/HF radio installation. This watch may be kept by means of a scanning receiver;

.4 for shore-to-ship distress alerts, if the ship, in accordance with the requirements of the Rules, is fitted with a recognized mobile satellite service ship earth station;

.5 on VHF channel 16. This watch shall be at the position from which the ship is normally navigated.

2.1.5 Every ship, while at sea, shall maintain a radio watch for broadcasts of maritime safety information and search-and-rescue related information on the appropriate frequency or frequencies on which such information is broadcast for the sea area in which the ship is navigating.

2.2 PERFORMANCE STANDARDS FOR RADIO EQUIPMENT

2.2.1 The radio equipment required by this Part shall comply with the requirements of the normative documents in [Appendix 3](#) and be of a type approved by the Register.

2.3 SOURCES OF POWER

2.3.1 There shall be available at all times, while the ship is at sea, a supply of electrical energy sufficient to operate the radio equipment as well as to charge a reserve source of electrical power.

2.3.2 Conditions for providing power supply of radio equipment from an emergency source of power in cases when the supply of electrical power from the main sources of power is discontinued are regulated in Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

2.3.3 A reserve source of electrical power shall be provided on every ship to supply radio installation, for the purpose of conducting distress and safety radiocommunications, in the event of failure of the ship's main and emergency sources of electrical power.

In this case, the provision shall be made for visual and audible signalling system for switching to a reserve source of electrical power at the position from which the ship is normally navigated.

Electrical power shall be supplied to this signalling system by means of the emergency source of electrical power.

The signalling system shall be non-disconnectable and capable of being automatically reset after the power supply from the ship mains has been restored. Provision shall be made for manual acknowledgement of audible signals.

Where a manual switch is used for changing-over to a reserve source of electrical power to supply radio installation, it shall be fitted at the position from which the ship is normally navigated and shall be distinctly marked and readily accessed.

Changing-over to a reserve source of electrical power shall not result in the loss of data stored in the equipment memory.

The reserve source of electrical power shall be independent of the propelling power of the ship and the ship's electrical network.

A rechargeable accumulator battery with an automatic charging device or a source of uninterruptable power supply may be provided as the reserve source of power.

2.3.4 The reserve source of electrical power shall be capable of simultaneously operating the radio equipment for the areas of navigation for which the ship is equipped and any of the additional loads mentioned in [2.3.7](#) and [2.3.8](#) for a period of at least:

.1 one hour on all ships intended for navigation within the inner and/or outer road of the port basin as well as on ships provided with an emergency source of electrical power providing supply of the radio equipment, if such source of power complies fully with all relevant requirements of Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships;

.2 six hours on all other ships.

2.3.5 Capacity of accumulator battery used as reserve source of electrical power shall be determined proceeding from the minimum required period of power supply required by the equipment connected (during 1 hour or 6 hours) and the maximum possible current utilized by all the equipment connected to the battery with regard to the sum of three values:

1/2 of the current consumed for transmission mode;

current consumed for reception mode;

current consumed by additional loads (lighting, EPFS receiver).

When defining the minimum required capacity of the battery used as reserve source of electrical power, consideration shall be given to the following:

the capacity of a lead acid battery is normally quoted at 20-hour discharge at an operational temperature of 20 °C;

the capacity of a lead acid battery at 1-hour discharge is approximately 50 % of the capacity at 20-hour discharge;

the capacity of a lead acid battery at 6 h discharge is approximately 80 % of the capacity at 20-hour discharge;

for batteries other than the lead acid type the capacity at 1-hour discharge is approximately 60 % of the capacity at 10-hour discharge, and 6-hour discharge will be approximately 92 % of the capacity at 10-hour discharge.

When defining the final value capacity of the battery used as reserve source of electrical power, consideration shall be given to the expected extreme temperatures for the location of the battery and reduction of its capacity during its operation (battery ageing).

To consider possible reduction of the battery capacity during its operation (battery ageing), an extra 40 % capacity shall be added to the calculated battery capacity.

2.3.6 The capacity of the accumulator battery shall be checked using a relevant method at intervals not exceeding 12 months, when the ship is not at sea.

When installed on board, accumulator batteries shall always have a clear marking containing the following data:

- .1 type of the battery or a construction;
- .2 date when the battery or construction was installed;
- .3 capacity at 1-hour discharge rate;
- .4 capacity at 6-hour discharge rate.

In way of the accumulator batteries of a non-tight type that are installed, there shall be a plate warning of explosion.

2.3.7 If, in addition to the VHF radio installation, two or more radio installations for which the reserve supplying is required, can be connected to the reserve source of electrical power, it shall be capable of simultaneously supplying for the period specified in [2.3.4.1](#) or [2.3.4.2](#), the VHF radio installation and:

- .1 all other radio installations which can be connected to the reserve source of electrical power at the same time; or
- .2 whichever of the other radio installations will consume the most power, if only one of the other radio installations can be connected to the reserve source of electrical power at the same time as the VHF radio installation.

2.3.8 The reserve source of electrical power may be used for the electrical lighting of the controls of the VHF radio installation as well as the radio installation complying with the sea area in which the ship is navigating.

2.3.9 If the reserve source of electrical power consists of rechargeable accumulator battery, an automatic charging device shall be provided, which shall be capable of recharging the accumulator battery within 10 hours.

The automatic charging device shall be operational within five seconds of switching on or after interruption of power supply from the main and/or emergency shipboard source of electrical power.

The automatic charging device shall be designed and constructed so that it is protected against damage resulting from disconnecting the batteries or, with the battery disconnected, short-circuiting the battery connections. If this protection is provided by electronic means it shall reset automatically following the removal of the open or short-circuit conditions.

In the automatic charging device provision shall be made for light indication of the device operation, as well as indication of the battery charging/ discharging voltage and current intensity.

In the automatic charging device provision shall be made for audible and visual alarms, indicating when the charging voltage or current is above the limits determined by the accumulator battery manufacturer. A protection shall be provided against overcharging/discharging of accumulator batteries due to possible faults in the charging device.

Alarm shall be non-disconnectable and capable of being automatically reset after the normal charging conditions of accumulator battery has been restored. Provision shall be made for manual acknowledgement of the audible alarm.

Failure of the said alarms shall not interrupt charging or discharging of the accumulator battery.

The above-mentioned alarms shall be provided at the position, from which the ship is normally navigated.

2.3.10 Where the automatic charging device for accumulator battery charging is used in ships in which the equipment is maintained operative by skilful maintenance and repair at sea, it shall provide at least automatic regulation of charging current. In ships where the equipment is maintained operative by means of other than skilful maintenance and repair at sea (duplication of the equipment and/or shore-based maintenance) the automatic charging device shall provide unattended charging of the accumulator batteries at sea.

2.3.11 No failure of accumulator batteries or the battery charging device shall impair the operating capability of any radio equipment being charged from the ship's source of electrical power.

2.3.12 One reserve source of electrical power may be used to supply radio equipment if the capacity is sufficient to operate both the basic and duplicated radio equipment simultaneously. The battery capacity shall also be sufficient to operate the EPFS receiver and emergency lighting.

2.3.13 If a source of an uninterruptable power supply is used as a reserve source of electrical power the alarms required by [2.3.3](#) and [2.3.9](#) shall be activated also in case of faults in the source of the uninterruptable power supply itself.

In case of failure of the source of the uninterruptable power supply provision shall be made for connection of radio installation to the second source of the uninterruptable power supply or for the direct connection of radio installation to the main or emergency source of electrical power.

Rated current of the charging device shall be determined by the sum of four values as follows:

- .1 1/10 of the current consumed for transmission;
- .2 current consumed for reception;
- .3 current consumed for additional loads;
- .4 rated battery charging current.

2.3.14 If an uninterruptable input of the ship's coordinates from the ship radio navigation system receivers as well as the data from the ship's navigation or other equipment to a radio installation required by this Section is needed to ensure its proper work, this equipment shall be supplied from the main, emergency and reserve sources of electrical power.

2.4 SPARE PARTS AND SUPPLY

2.4.1 The necessary complement of spare parts, tools, materials and measuring instruments shall be provided on every ship, irrespective of the radio equipment maintenance and repair methods.

If the serviceability of the equipment is ensured by its duplication, the list and amount of spare parts for each type of the radio equipment may be minimum established by manufacturer.

2.4.2 For wire-type MF-band antenna the spare antenna shall be provided, completely assembled for immediate erection.

2.5 MAINTENANCE AND REPAIR OF RADIO EQUIPMENT

2.5.1 On ships engaged in voyages in sea area A1, as well as in sea areas A2, the serviceability shall be ensured by one of the following methods: duplication of equipment, shore-based maintenance and repair or at-sea electronic maintenance and repair capability, or a combination of these.

2.5.2 On ships engaged in voyages in sea areas A3 as well as A4, the serviceability shall be ensured by using a combination of at least two methods such as duplication of equipment, shore-based maintenance and repair or at sea electronic maintenance and repair capability.

2.5.3 If the serviceability of the equipment is ensured by its duplication, the duplicated equipment shall include:

for sea area A1 — VHF radiotelephone station with DSC;

for sea area A2 — VHF radiotelephone station with DSC and MF radiotelephone station with DSC;

for sea area A3 — VHF radiotelephone station with DSC, and RMSS SES, or MF/HF radio installation, herewith RMSS SES with lesser coverage shall determine the coverage of sea area A3 as a primary system;

for sea area A4 — VHF radiotelephone station with DSC and MF/HF radio installation.

2.5.4 All duplicating equipment shall be connected to the separate antennas, to the main, emergency and reserve power sources and be ready for the immediate use.

2.5.5 If the serviceability of the equipment is ensured by the shore-based maintenance and repair, there shall be on board the agreement for these services with the equipment manufacturer or with the works authorized for those by the manufacturer or a written declaration/plan showing how shore-based maintenance shall be carried out. In addition, in sea areas where ships are engaged in voyages, the opportunity for equipment maintenance and repair shall be provided.

Shore-based maintenance centres shall be recognized by the Register.

2.5.6 In the shore-based maintenance centers and in organizations engaged in on board installation of radio equipment the radio operators shall be properly instructed on how to use the installed radio equipment and familiarized with the maintenance and repair principles prior to putting the equipment in operation.

2.5.7 If the serviceability of the equipment is ensured by at sea electronic maintenance and repair, these services shall be provided by the radio operator holding a relevant Certificate of Competence.

2.5.8 All the ships engaged on voyages in sea areas A3 or A4, irrespective of the radio equipment maintenance and repair methods, shall always have on board:

.1 specifications and user's manuals for all radio equipment and battery chargers provided by the equipment manufacturer in English or in the working language of the crew;

.2 specifications and battery capacity calculations for the installed batteries;

.3 antenna arrangement drawings (plan and profile);

.4 radio arrangement drawings (at least in two views);

.5 wiring diagram of all the radio equipment and commutation of antennas.

Technical documentation specified in [2.5.8.3](#), [2.5.8.4](#) and [2.5.8.5](#) shall be corrected for compliance with all the amendments introduced during operation of the ship and approved by the Register;

.6 tools, instruments and spare parts for all radio equipment complying with the specified maintenance method(s);

.7 ITU publications according to requirements in the Radio Regulations (Radio Regulations, Volume 2, Appendix 16):

List of ship stations and maritime mobile service identity assignments in either printed or electronic format;

List of coast stations and special service stations in either printed or electronic format;

Manual for use by the maritime mobile and maritime mobile-satellite services in either printed or electronic format.

The amount of technical documentation, tools, instruments and spare parts shall be agreed by the Register.

2.5.9 On ships engaged on voyages in sea areas A3 or A4, if serviceability of the radio equipment is ensured by a combination of methods, including the skilful maintenance and repair at sea, then the relevant additional technical documentation, tools, instruments and spare parts shall be available on board to enable maintenance, surveys and detection and elimination of any faults. The amount of additional technical documentation, tools, instruments and spare parts to be kept on board shall comply with the installed equipment and be approved by the Register.

2.5.10 On ships engaged on voyages in sea areas A1 or A2 the amount of technical documentation, tools, instruments and spare parts shall be agreed by the Register and determined based on the requirements of [2.5.8](#) and [2.5.9](#), depending on the operating conditions of the ship, composition of radio equipment and methods of its maintenance and repair.

2.5.11 On all the ships radio communication in distress and for safety shall be ensured by the skilful radio operators. These operators shall hold relevant Certificates of Competence; any of them may be assigned responsible for radio communication in distress.

2.5.12 A ship station radio license issued in accordance with established procedure shall be available on all ships.

3 SPACES FOR RADIO EQUIPMENT, ITS ARRANGEMENT, CABLING

3.1 GENERAL

3.1.1 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 of radio installation with other equipment and systems;

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

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

.4 be provided with safe and uninterrupted illumination, independent from the main and reserve source of electrical power intended for sufficient illumination of the radio installation controls;

.5 be placed considering the safe distance from magnetic compass.

Provision shall also be made for special spaces intended for arrangement of the accumulator batteries of the reserve source of electrical power of the radio equipment.

In some ships where it is impossible to provide a separate accumulator battery room, it is allowed to arrange accumulator batteries in accumulator battery boxes (cabinets) provided the requirements specified in [3.2](#) are observed.

3.1.2 All radio equipment shall be so located in a ship that its operational efficiency is in no way impeded by the ship being submerged to the level of the deck where it is arranged.

3.1.3 All radio equipment shall be so installed that it is readily accessible for maintenance and repair on board ship. Radio equipment shall be securely fastened and shall not shift notwithstanding the angles of heel and trim of the ship or severe bumps and shaking likely to occur under service conditions.

3.2 ACCUMULATOR BATTERY ROOM

3.2.1 The accumulator battery room which is intended for installation of the accumulator batteries used for feeding the reserve source of electrical power, shall be located on or above the navigation bridge deck level in such a place that the length of cables leading to radio equipment does not exceed 15 m. The accumulator battery room shall be provided with an exit to the open deck of the ship.

3.2.2 The construction of the accumulator battery room as well as its systems of heating and ventilation shall comply with the requirements specified in Part VIII "Systems and Piping" and in Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

3.2.3 The accumulator battery room shall be provided with electric lighting complying with the requirements specified in Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

3.2.4 The installation of the accumulator batteries, not relating to the radio equipment, in the accumulator battery room is allowed only if it causes no radio interference.

3.2.5 The arrangement of accumulator batteries shall comply with the requirements set forth in Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

3.2.6 Degree of protection of accumulator battery boxes (cabinets) installed on the open deck of the ship shall not be below IP56 and placed at a height of at least 100 mm above the deck.

The design, heating and ventilation systems of accumulator battery boxes shall comply with the requirements specified in Part VIII "Systems and Piping" and Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

3.2.7 The accumulator batteries shall be electrically insulated from the ship's hull.

3.2.8 The accumulator batteries shall be so located and installed as to ensure:

- .1** the highest degree of service;
- .2** a reasonable lifetime;
- .3** a reasonable safety;
- .4** that when charged to the rated capacity, the accumulator batteries will provide the hours of operation required by the present Part under all weather conditions.

3.2.9 The accumulator battery temperature shall remain within the manufacturer's specifications whether under charge, discharge or idle.

3.3 ARRANGEMENT OF RADIO EQUIPMENT ON NAVIGATION BRIDGE

3.3.1 The workstation intended for installation of radio equipment shall be located in the aft of the navigation bridge so that the watch officer assistants have an overall view of the navigation while operating the radio equipment.

If the workstation and the rest of the navigation bridge are separated by a bulkhead, it shall be made of glass or fitted with windows.

There shall be no lockable door between the workstation and the navigation bridge.

When the work station is being used during night-time, a curtain separating it from the rest part of the navigation bridge shall be provided in order to avoid dazzling effect from the lights to the watch-keeping personnel and the pilot.

The radio work station shall be provided with the furniture and equipment as follows: operating table, working chair secured on the deck as well as the main lighting and lighting from the reserve source of power.

3.3.2 The radio equipment shall be so arranged and installed that the magnetic field produced by it will not influence the ship magnetic compass readings.

3.3.3 Radio equipment fitted on the navigation bridge as an additional equipment shall be so arranged that its functioning or technical condition could not adversely affect normal operation or cause failure of radio, navigational or other equipment required by the Rules.

3.3.4 The VHF radio installation with the controls of the radiotelephone channels providing generation and transmission of the distress and safety alert in the DSC and radiotelephony mode shall be located forward of the navigation bridge near the radar display station so that immediate access and priority is possible at all times, if additional control units are provided, and while using them the officer of the watch shall face the ship's bow.

When there is more than one control unit, indication shall be given to the other units that the radio station is in operation.

Where necessary, facilities for radio communications from the wings of the navigation bridge shall be provided. Portable VHF radio equipment may be used to meet the latter requirement.

3.3.5 The MF radio installation with controls providing generation and transmission of the distress alert in the DSC and radiotelephony mode, as well as communication in distress and for safety in the radiotelephony mode shall be located at workstation for radio communication.

3.3.6 The MF/HF radio installation with controls providing generation and transmission of the distress alert in the DSC mode as well as communication in distress and for safety in the radiotelephony mode shall be located at workstation for radio communication.

3.3.7 The ship earth station of the recognized mobile satellite service with controls providing transmission of the distress alert and communication in distress, as well as providing the safety, shall be located at workstation for radio communication.

3.3.8 The VHF, MF, MF/HF-radio installations and the recognized mobile satellite service ship earth station with the controls providing generation and transmission of the distress alert as well as communication in distress and for safety ([refer to 3.3.4](#), [3.3.5](#), [3.3.6](#), [3.3.7](#)), fitted for duplication, shall be located at workstation for radio communication.

3.3.9 If the radioroom is provided, then after transmission the distress alert from workstation for radio communication in compliance with [3.3.5](#), [3.3.6](#) and [3.3.7](#), the radio communication in distress and for safety may be performed from the radioroom.

3.3.10 The float-free EPIRB shall be located in compliance with the requirements of [3.5](#).

3.3.11 The plate with the call sign of the ship, the ship station identity and other codes as applicable for the use of the radio equipment shall be posted up in close proximity to the controls of radio installations providing transmission of the distress alert as well as communication in distress and for safety.

3.3.12 Illuminating lamps built in the radio equipment and intended for the arrangement on the navigation bridge shall be provided with luminous intensity control facilities.

3.3.13 In addition, the following requirements shall be complied with on passenger ships engaged on voyages in sea areas A2, A3 or A4:

.1 the distress panel shall be located at the navigation bridge. This panel shall have either one button which activates transmission of the distress alert by all radio installations intended for that purpose on board, or one button for every separate radio installation. There shall be clear visual indication on that panel that the button or buttons were pushed.

The button or buttons shall be protected against inadvertent operation.

When the float-free EPIRB is used as the second independent means of distress alert transmission and not provided with remote activation, provision shall be made for the additional EPIRB placed in close proximity to workstation for radio communication ([refer to 3.5.1](#));

.2 the relevant radio communication equipment shall be continuously and automatically provided with the ship's position data for inclusion in the original distress message when the button or buttons on the panel initiating a distress alert are pushed;

.3 panel signalling a distress alert shall be installed at the position, from which the ship is normally navigated. The panel initiating a distress alert shall be provided with visual and audible warning to indicate receipt of any distress alert, as well as indication of the radio service, via which the distress alert was received;

.4 fixed or portable two-way VHF radiotelephone apparatus intended for communication with aircraft shall be kept in the navigation bridge at a prominent place.

3.3.14 Radio equipment installed for duplication on ships engaged on voyages in sea areas A3, as well as A4 does not need to be connected to the distress panel, if this equipment transmits the distress alert and is installed in close proximity to the panel.

3.3.15 An audible and light signalling system shall be provided in order to indicate reception of distress or urgency calls, or a call having distress category, as well as those not being urgency or distress calls. The signalling system shall be non-disconnectable. Provision shall be made for manual acknowledgement of signals. Possibility of checking the audible and light signalling system shall be provided.

3.3.16 DSC operation procedures shall be posted near the radio installations on the navigation bridge of each ship. Emergency procedures shall be posted near the relevant radio installations on the bridge.

"GMDSS Operating Guidance for Masters of Ships in Distress Situations" and the procedure "False Alerts", both drawn up by IMO, shall be posted on the navigation bridge.

3.4 ARRANGEMENT OF TWO-WAY VHF RADIOTELEPHONE APPARATUS AND TWO-WAY VHF RADIOTELEPHONE APPARATUS INTENDED FOR COMMUNICATION WITH AIRCRAFT

3.4.1 The two-way VHF radiotelephone apparatus (including primary batteries) shall be kept in the navigation bridge or in any other compartment which is kept unlocked while the ship is at sea, if such compartment provides quicker and more convenient transfer of the apparatus to any lifeboat or any liferaft.

The apparatus shall be kept at a prominent place. All fastenings, if any, intended for securing the apparatus at the place of storage shall be designed for urgent releasing without applying tools.

A clearly visible symbol complying with the provisions of IMO resolution A.1116(30) shall be fitted near each position where the two-way VHF radiotelephone apparatus is located.

3.4.2 Lifeboat fixed two-way VHF radiotelephone apparatus shall be located so that its operational capacity is not affected if the boat is flooded by water taken in up to the level of upper seat pans.

3.4.2.1 When accumulator batteries are provided as external source of electrical power for fixed two-way VHF radiotelephone apparatus, they shall be placed in the watertight boxes (IP68) complying with the requirements of Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

Electric lighting ensuring equipment control panel lighting not less than 50 lux shall be fed from the above stated accumulator batteries.

3.4.2.2 Accumulator batteries charging from generator, coupled to lifeboat engine, and from ship source of electrical power shall be provided. Flexible cable connecting batteries to charger, fed from the ship source of electrical power, shall ensure its immediate release in case of lifeboat quick launching.

3.4.3 The two-way VHF radiotelephone apparatus intended for communication with aircraft (including primary batteries) shall be kept in the navigation bridge at a prominent place.

3.4.4 The fixed two-way VHF radiotelephone apparatus intended for communication with aircraft shall be located in the navigation bridge at a prominent place.

3.5 LOCATION OF EMERGENCY POSITION-INDICATING RADIO BEACONS

3.5.1 A satellite emergency position-indicating radio beacon (EPIRB) intended as the second independent mean of distress alert transmission and not provided with remote activation shall be installed in close proximity to the conning position so that immediate access is possible at all times for initiating the distress alert as well as it shall be manually released and easily placed in any lifeboat or liferaft by a single person.

3.5.2 A float-free EPIRB shall be stowed on the open deck of the ship so that it does not move during ship's extreme conditions and floats free in case of sinking of the ship. Meanwhile, an immediate access shall be arranged for manual release and initiating the distress alert and possibility of fast and easy placement in any lifeboat or liferaft by a single person.

3.5.3 At any place of EPIRB installation the highly visible symbol marked in accordance with the provisions of IMO resolution A.1116(30) shall be provided.

3.6 LOCATION OF SHIP'S AND SURVIVAL CRAFT SEARCH-AND-RESCUE LOCATING DEVICE

3.6.1 At least one search-and-rescue locating device: radar SART or AIS-SART, shall be carried on each ship.

The search-and-rescue locating device shall be stowed in such locations that it can be rapidly placed in any survival craft other than the liferaft or liferafts required by 4.1.1.4, Part II "Life-Saving Appliances". Alternatively, one search-and-rescue locating device shall be stowed in each survival craft other than those required by 4.1.1.4, Part II "Life-Saving Appliances".

On ships carrying at least two search-and-rescue locating devices and equipped with free-fall lifeboats one of the search-and-rescue locating devices shall be stowed in a free-fall lifeboat and the other located in the immediate vicinity of the navigation bridge so that it can be utilized on board and ready for transfer to any of the other survival craft.

3.6.2 At any place of installation of ship's and survival craft search-and-rescue locating device (radar SART or AIS-SART) the highly visible symbol shall be marked in accordance with the provisions of IMO resolution A.1116(30).

3.7 CABLING

3.7.1 All cabling of the radio equipment and protection measures against radio interference caused by the ship's electrical installations shall comply with the requirements specified in Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships as well as with additions and amendments set forth in the present Chapter.

3.7.2 The protection measures against radio interference caused by the ship's electrical devices fitted with means of protection according to the requirements of Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships shall provide for such reception conditions that switching on and operating of such devices shall not increase the output voltage of each receiver by more than 20 % of the voltage value caused by internal noises.

3.7.3 Radio equipment shall be supplied from the distribution board of the radio equipment in compliance with the requirements of Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

The distribution board of the radio equipment shall be provided with the switching and protective equipment for connection and protection of the appropriate radio equipment in each outgoing feeder.

Connection of any consumers not relating to the radio equipment to the distribution board of the radio equipment is not allowed.

3.7.4 The space intended for radio equipment shall be provided with a light indicator or measuring instrument for continuous checking of the ship's mains voltage.

3.7.5 All cabling included into the cabling network of shipboard radio communication facilities shall be made by means of screened cables, with continuity of screening being preserved.

3.7.6 All cabling in the compartments equipped with shipboard radio communication facilities and radio navigational facilities shall be made by means of screened cables, with continuity of screening being preserved. It is not allowed to use at such places any radio equipment and electrical devices without adequate screening.

The armour of cables is recommended to be earthed at those places where the cables enter the ship spaces in which radio-receiving apparatus is installed.

3.7.7 Metal cases of radio apparatus shall be electrically connected to the ship's hull as directly as possible. The screening armour of cables, where the cables enter the equipment, shall be electrically connected to the cases of the equipment.

3.7.8 The coaxial cables shall comply with the following requirements:

.1 coaxial cables shall be fitted in separate cable runs laid at least 10 cm away from power cables;

.2 crossing of cables shall be done at right angles;

.3 where there is one bend in one place, bending radius shall exceed external diameter of the cable 5 times;

.4 where there are several bends in one place, bending radius shall exceed external diameter of the cable 10 times;

.5 where flexible cables are used, bending radius shall exceed external diameter of the cable 20 times.

Coaxial cables in cargo holds, on the open deck and on masts shall be laid in compliance with the requirements of Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

3.7.9 In cabling connecting panels for remote transmission of distress alert, DSC encoders, structurally made as separate units, plug connectors shall not be used.

3.7.10 Insulation resistance of every laid cable disconnected at both ends from the radio equipment shall not be less than 20 MOhm, irrespective of the cable length.

4 ANTENNAS AND EARTHING

4.1 GENERAL

4.1.1 It is allowed to fit a ship with an antenna of any type which provides the highest operational efficiency of the radio equipment in accordance with its purpose.

Aerials shall be capable of withstanding the effects of mechanical and climatic factors encountered under the ship's service conditions.

4.1.2 All ship antennas shall be capable of withstanding a pressure of air flow having speed of 60 m/s in any directions, the ship's speed and other factors being not considered.

4.1.3 Wire antennas shall be manufactured of flexible stranded antenna wire made of copper or copper-based alloy. To satisfy the requirements of [4.1.2](#), when calculating the minimum diameter of the antenna wire, the antenna sag shall be taken as equal to 6 % of the antenna span.

4.1.4 Each horizontal antenna wire shall be made of one-piece stranded wire. Where the construction of the antenna does not permit to make the down-lead and the corresponding horizontal antenna of one-piece wire, the connection of the horizontal antenna wire with the down-lead shall be made by means of splicing or by means of compression couplings providing the reliable electrical contact.

4.1.5 For the purpose of increasing durable and reliable operation of wire T-type antenna, the main mechanical load of its down-lead shall not apply directly to the place of the down-lead connection with the horizontal wire.

It is recommended to apply this requirement during the assembling of F-type antennas.

4.1.6 The down-lead wire of an antenna shall be secured at the lead-in to a guy fitted with insulators; then the down-lead wire shall be connected to the lead-in by means of copper or brass thimble. The connection of the thimble with the down-lead wire shall be effected by soldering or cold pressing.

4.1.7 The antenna rigging shall ensure the possibility for quick lowering and hoisting as well as tension regulation of the wire antenna without man hoisting to the mast tops.

4.1.8 As far as is practicable, every wire of multiwire antenna shall be capable of being hoisted and lowered separately. The span between the wires shall not be less than 700 mm.

4.1.9 Halyards used for hoisting wire antennas shall be flexible halyards made of the material approved by the Register. Hoisting halyards used in ships carrying readily flammable cargoes shall be made of non-combustible materials and their securing positions shall be outside a dangerous space. If steel halyards are used in this case, they shall be reliably electrically connected to the ship's hull.

4.1.10 Special high frequency insulators rated for corresponding operational voltage and mechanical load shall be used for the antenna insulation.

4.1.11 The antenna insulation resistance in relation to the ship's hull under normal climatic conditions shall not be less than 10 MOhm, and under excessive humidity, not less than 1 MOhm (for MF/HF transmitting antennas, 50 MOhm and 5 MOhm are recommended accordingly).

4.1.12 Mast-type antennas and antennas of other types consisting of some separate conducting units shall be so constructed that the value of contact resistance of any electrical connection does not change under the influence of mechanical loads and climatic factors encountered under service conditions.

4.1.13 The transmitting antennas shall be designed for operation of any transmitter connected to them at maximum values of its output power and impressed voltage.

The construction of the transmitting antennas shall exclude any possibility of the corona-effect.

4.1.14 The receiving antennas shall be so constructed and arranged that their interaction with all transmitting antennas and with one another is minimum.

4.1.15 Individual lengths of the horizontal and down-lead wires of the antennas shall be located at a distance not less than 1 m from funnels, masts and other metal objects of the ship. The antennas shall be arranged so as to prevent touching the metal structures of the ship under any service conditions.

4.1.16 Separate elements of the mast-type antennas such as wires, pins and insulators shall be easily replaceable.

It is recommended to provide the collapsible mast-type antennas.

4.1.17 The antennas of general radio broadcasting and television receivers shall be arranged as far apart from all service purpose antennas as possible.

4.1.18 If the portable VHF radiotelephone station for service interior communications is stationary mounted, its antenna height shall not exceed 3,5 m above the navigation bridge deck.

4.1.21 When choosing location for installing radio equipment antennas one shall also be guided by the provisions of [4.2 – 4.5](#), unless otherwise is specified in manufacturer's technical documentation.

4.2 MF/HF ANTENNAS

4.2.1 The antennas shall provide the possibility of tuning transmitters to any frequency of the required frequency range, and the necessary radio communication. The receiving antennas may be of any type complying with the requirements of the Rules.

4.2.2 The mounting arrangement of the antenna or pedestal shall be constructed in order to withstand the strain from swaying and vibration.

4.2.3 The wire antenna shall be provided with means for its quick replacement by a spare antenna and shall have a device capable of preventing an antenna break caused by severe mechanical tension, for example, it may be a safety loop with a mechanical safety device fitted in the antenna halyard. The breaking force of the mechanical safety device shall be equal to not more than 0,3 of the breaking force of the antenna wire. The mechanical safety device shall be capable of ensuring sufficient slackening of the antenna tension, simultaneously preventing the antenna from touching superstructures, rigging and the ship's hull.

A device capable of preventing an antenna break need not be provided if the antenna length is not over 25 m and the antenna is suspended between the supports not subjected to the abrupt vibrations.

4.2.4 Whip antennas shall be installed as vertically as possible and located in an elevated position on the ship at least 1 m away from conductive structures.

4.2.5 Attention shall be paid to self-supportive vertical antennas and their swaying radius.

4.2.6 The recommended minimum length of the antenna is 8 m.

4.2.7 The down lead from the base of the antenna to the antenna tuner shall be insulated and run as vertically as possible (not less than 45° towards the horizontal plane).

4.2.8 The transmitting antenna shall have an insulation resistance to earth which is recommended to be of more than 50 MOhm in dry weather and of no less than 5 MOhm in humid weather (transmitter to be disconnected when measuring).

4.3 VHF ANTENNA

4.3.1 VHF antennas shall be placed in a position which is as elevated and free as possible, with at least 2 m horizontal separation from constructions made by conductive materials. Antennas shall be sufficiently separated from potential sources of electromagnetic interference (EMI) such as LED navigation lights to avoid harmful degradation of the receiver performance. Vertical separation can be an effective mitigation measure.

4.3.2 VHF antennas shall have a vertical polarisation.

4.3.3 Where possible, there shall not be more than one VHF antenna on the same level.

4.3.4 The location of mandatory VHF antennas shall be given priority compared with mobile telephone antennas. If they are located on the same level, the distance between them shall be at least 5 m.

4.3.5 It is recommended to use double screened cable with a maximum loss of 3 dB.

4.3.6 All outdoor installed connectors on the coaxial cables shall be watertight by design in order to give protection against water penetration into the antenna cable.

4.4 REQUIREMENTS FOR LOCATION OF ANTENNA SYSTEMS OF SHIP EARTH STATIONS

4.4.1 When choosing location for installing antenna systems, one shall be guided by Appendices [1](#) and [2](#).

4.5 LEAD-IN AND INTERIOR WIRING OF ANTENNAS

4.5.1 Wiring of the transmitting antennas into interior spaces of the ship shall be effected through special lead-in fitted with insulators capable of withstanding the corresponding operational voltage, except when the interior wiring of an antenna is made by means of a coaxial cable.

4.5.2 The construction of the lead-in of the transmitting antenna shall provide for the possibility of easy and ready connection and disconnection of the antenna, preferably, without applying any tools. The construction of the lead-in shall exclude any possibility of the corona-effect during the operation of the transmitter.

4.5.3 The leads-in of the transmitting antennas shall be, preferably, fitted at such places where they provide for the shortest possible run of antenna wiring in interior compartments from the lead-in to transmitters. When installed at readily accessible place, the lead-in and the antenna connected thereto shall be completely guarded against the possibility of accidental touching within 1800 mm above the appropriate deck, a stairway (ladder) or any other place where people may be present. When installing the protection casings or using the hollow mast-type antennas the provision shall be made for removing the condensate from the inner cavities of the structure.

4.5.4 To eliminate energy losses, it is recommended to use precaution guards made of insulating materials. If metal precaution guards are used, they shall be reliably earthed to the ship's hull. The precaution guard shall not cause a dead angle for visual bearing taking.

4.5.5 Feeders of transmitting MF-antennas, laid in interior compartments, shall be, preferably, as short as possible.

4.5.6 Feeders of transmitting antennas shall be screened; the antenna switches (commutators) shall be of a screened type.

4.5.7 Feeders of the receiving antennas shall be made with coaxial screened cables, with continuity of screening being preserved. In this case, all commutators, change-over switches, lightning arresters and other devices connected to such cables shall be of a screen type. Feeders shall not induce signal attenuation over 3 dB.

4.5.8 The coaxial screened cables of the feeders of receiving antennas shall be led directly to the open deck and connected to the receiving antennas at the sufficient height. This connection shall be made by means of special contact device of waterproof or hermetic design, providing for reliable electrical connection and access for control over its condition.

4.5.9 Every antenna not intended for constant switching to operational position shall be provided with a special commutating device fitted inside the compartment and capable of switching the antenna into operational, isolated and earthed positions.

4.5.10 Every receiving antenna shall be provided with a special device capable of protecting the receiver lead-in against atmospheric discharges.

4.5.11 If the matching system or the devices capable of protecting against atmospheric discharges are fitted between the receiving antenna and coaxial cable, they shall be connected on the antenna side.

4.6 EARTHING

4.6.1 Operational (high-frequency) earthing intended for ensuring normal operation of shipboard transmitters installed in the radioroom shall be made with the help of a copper busbar and shall run as directly as possible from the antenna commutator to a metal bulkhead or deck reliably electrically connected to the ship's hull. The busbar shall have tapplings leading to the earthing terminals of transmitters. The length of the bus-bar from the transmitter to the place where connection with the bulkhead or deck is effected shall not exceed 1000 mm. Depending upon the power of transmitters, the sectional area of busbars and tapplings shall be not below values indicated in [Table 4.6.1](#).

Table 4.6.1

Power of transmitter, W	Busbar sectional area, mm ²
Below 50	25
50 — 500	50
Above 500	100

In all cases, where practicable, it is allowed to effect the operational earthing of each transmitter separately by connecting the earthing terminals of a transmitter to the nearest metal bulkhead by means of a copper busbar or a flexible conductor of adequate sectional area.

4.6.2 In transmitters with emissive power above 50 W, the electric connection of the earthing busbar (flexible conductor) to the transmitter case shall be made in at least two places most widely apart.

4.6.3 Operational earthings of radio receivers installed in the radioroom shall be effected by means of a copper busbar or a flexible bronze (copper) stranded wire with a sectional area of not less than 6 mm² run as directly as possible from each receiver to the main earthing busbar of transmitters or directly to the nearest metal bulkhead reliably connected to the ship's hull.

4.6.4 Operational earthings of radio communication facilities shall be carried out in compliance with the requirements of the present Part for operating earthings of receivers or transmitters.

4.6.5 In non-metal ships the operational earthing shall be common for the shipborne radio equipment. In this case, the electrical contact of the earthing with water shall be effected by means of a tinned copper or brass plate of at least 4 mm thick and having an area of not less than 0,5 m² secured to the outside surface of the hull below the lightest draught of the ship. It is recommended to provide two such earthings; in such a case, the contacting surface of each earthing plate may be reduced to half the above value.

Metal keel binding or anti-teredo metal plating of wooden ships may be used instead of specially provided earthing gear.

4.6.6 On non-metal lifeboats the earthing of the radio station shall be made with two tinned copper tapes of not less than 1 mm thick and having the common area of not less than 0,1 m², fitted to the right and to the left of the keel near the middle frame of the boat.

4.6.7 The connecting wires of protective earthing of the apparatus cases shall be as short as possible, but not more than 150 mm long.

4.6.8 Protective earthing of lower ends of standing rigging of masts and funnels shall be made with flexible metal conductors. Such conductors shall be provided with special soldered thimbles which shall be secured to the metal hull of the ship by means of two screws or by welding. The spots of connection with the hull shall be painted.

4.6.9 The total resistance of all electric connections of any earthing shall not exceed 0,02 Ohm.

4.6.10 It is not allowed to use the earthing gear of radio equipment as a lightning arrester.

INMARSAT RECOGNIZED MOBILE SATELLITE SERVICES

1 SATELLITE COMMUNICATION ANTENNAS

1.1 GENERAL PROVISIONS

1.1.1 In general, satellite antennas shall be located so that they have a 360° free view for the satellite at all times. In practice terms this can be difficult to achieve due to shadow sectors from nearby structures.

1.1.2 For Inmarsat-C (omni-directional antenna) and Fleet Safety (BGAN antenna) it is recommended that communication shall be maintained with the satellite down to an elevation of minus 5° in the fore and aft direction and minus 15° in the port and starboard direction.

1.2 SATELLITE COMMUNICATION ANTENNA INSTALLATION

1.2.1 The following guidelines shall be observed in order to fulfil the above recommendations:

.1 the antenna shall be located at the top of the radar mast or on a pedestal, in the radar mast, or on the top deck so that:

for directive antennas: shadows from constructions, especially within a distance of 10 m, shall be maximum 6°;

for omnidirectional antennas: shadows from constructions, especially within a distance of 1 m, shall be maximum 2°;

.2 antennas shall be installed in a readily accessible location;

.3 satellite antennas shall not be located in an area where they can be damaged by heat and smoke;

.4 the satellite antenna shall not be located on the same plane as the ships' radar antenna;

.5 EPFS antennas shall not be located close to or on the same horizontal plane as the Inmarsat antenna;

.6 consideration shall be given to installing the Inmarsat antenna on a suitable pedestal.

(IMO resolutions A.663(16), A.698(17), A.808(19), MSC.130 (75) and MSC.513(105); Inmarsat Design and Installation Guidelines)

Note. The mast or pedestal shall be constructed so that vibrations are reduced as much as possible.

1.3 SAFE ANTENNA DISTANCES

1.3.1 The following "safe distance" from Inmarsat antennas to other antennas and to the compass are recommended:

.1 distance to the HF antenna shall be more than 5 m;

.2 distance to VHF antenna shall be more than 4 m;

.3 distance to the magnetic compass shall be more than 3 m.

(The installation manual for the equipment and Inmarsat guidelines)

1.4 INMARSAT-C

1.4.1 Antenna.

The antenna shall be constructed so as to function up to 15° pitch and roll. In order to obtain this result, the antenna shall be located in such position that no objects or constructions down to 15° below the horizon are degrading the performance of the equipment.

Note. As it may be difficult to fulfil this recommendation in fore-and-aft, the free area in this direction may be reduced to 5° below the horizon.

(IMO resolutions A.663(16) and MSC.513(105))

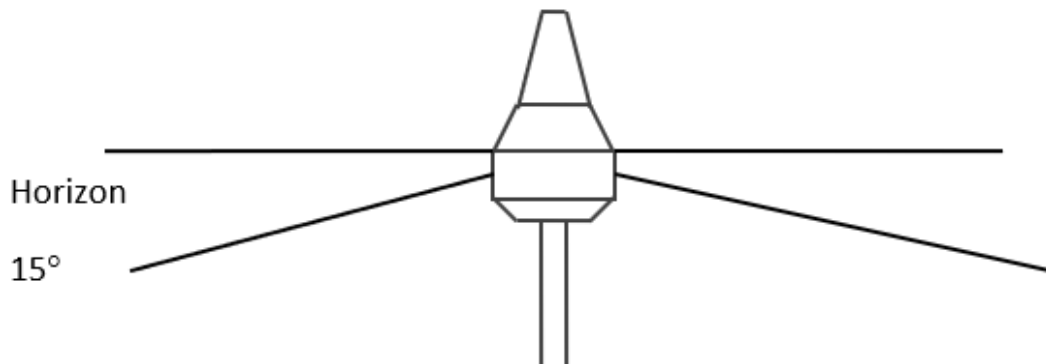


Fig. 1.4.1
Position of SES antenna relative to horizon with reference to longitudinal and lateral tilt
(refer also to the note above)

1.4.2 Calculation of distance to obstructions.

The antenna unit shall be installed with a 360° clear view of the sky. However, minor obstructions such as a mast will not degrade the antenna performance severely, if a separation distance larger than 20 times the diameter of the obstruction is kept.

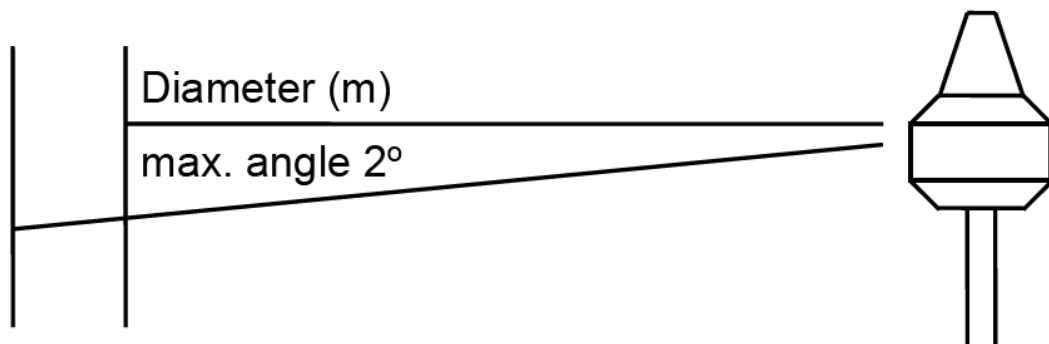


Fig. 1.4.2
Position of SES antenna relative to obstructions

If two Inmarsat-C antennas are installed, the vertical distance between them shall be at least 1 m to eliminate interference. The antennas shall be installed such as to ensure electromagnetic compatibility.

1.4.3 Antenna cable.

The manufacturers specifications regarding total attenuation and maximum DC resistance (short-circuit in one end) shall be complied with. Only double-screened cable shall be used.

1.5 FLEET SAFETY

1.5.1 Antennas.

Fleet Safety antennas are 2-axis stabilized BGAN antennas varying in size and throughput: FleetBroadband 150, FleetBroadband 250, FleetBroadband 500 and Fleet One.

All antennas rotate 360° horizontally and down to -25° vertically for the FleetBroadband 500 and -60° vertically for the FleetBroadband 150, 250 and Fleet One in pitch and roll, to allow for continuous pointing even in heavy sea conditions. Any obstructions within this volume can cause signal degradation.

1.5.2 Obstructions.

The antenna shall be mounted as far away as possible from the ship's radars and highpower radio transmitters (including other Inmarsat based systems), because they may compromise the antenna performance. RF emission from radars might actually damage the antenna. Since a radar radiates a fan beam with a horizontal beam width of a few degrees and a vertical beam width of up to +/- 15°, the worst interference can be avoided by mounting the antenna at a different level – meaning that the antenna is installed minimum 15° above or below the radar antenna.

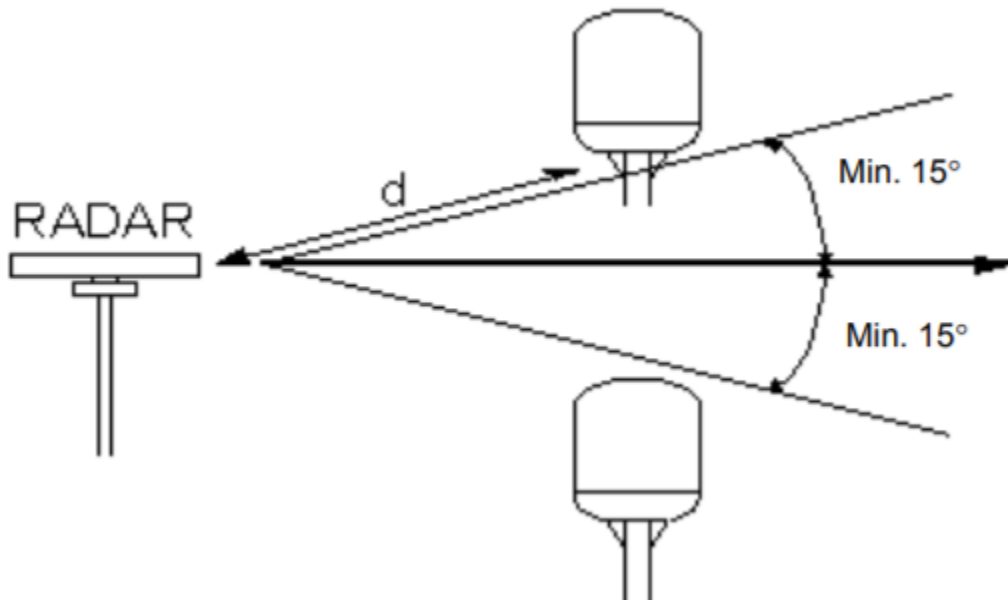


Fig. 1.5.2

Position of SES antenna relative to radar antenna

The FleetBroadband antenna may also interfere with other radio systems. Especially other Inmarsat systems and EPFS receivers with poor frequency discrimination are vulnerable to the radiation generated by the FleetBroadband antennas.

1.5.3 Antenna cable.

A coaxial cable for connection between the antenna and terminal is delivered with the system. The manufacturers specifications regarding total attenuation and maximum DC resistance (short-circuit in one end) shall be complied with. The maximum allowed RF-loss in the antenna cable is 20 dB at 1660 MHz. This is to ensure the performance of the system.

IRIDIUM RECOGNIZED MOBILE SATELLITE SERVICES

SYSTEM-SPECIFIC GUIDELINES – OMNIDIRECTIONAL ANTENNA

Personnel installing or servicing the system shall be professionals with technical expertise, properly trained, and likewise authorized. All safety instructions and guidelines in the manufacturer's manual shall be observed.

1 ANTENNA UNIT

The antenna unit is designed for outdoor mounting and connected to the Control Unit via a coaxial cable. The antenna unit specifications are as described in the manufacturer's manual. In general terms, it will be expected that the antenna unit has a downwards-facing "female" connector, while the antenna cable has an upwards-facing "male" connector.

1.1 MOUNTING AND INSTALLATION CONSIDERATIONS

Compass safe distance: the compass safe distance for standard and steering compasses is 0,85 m (2,8 ft) and 0,65 m (2,1 ft), respectively. Observe these distances to prevent interference to a magnetic compass.

The antenna unit shall be installed outside the radar main beam. Typically, this is in the order of 20 degrees. To avoid near field antenna coupling, a minimum distance of 2,5 m (8 ft) between the radar antenna and the antenna unit shall be obeyed. The figure below illustrates how the antenna unit shall be mounted to avoid interference from radars. However, depending on the specific radar frequency and power level, the separation distance between the radar and the antenna unit may be reduced, with no impact on the antenna performance. The performance of the antenna unit shall be validated when the system is installed.

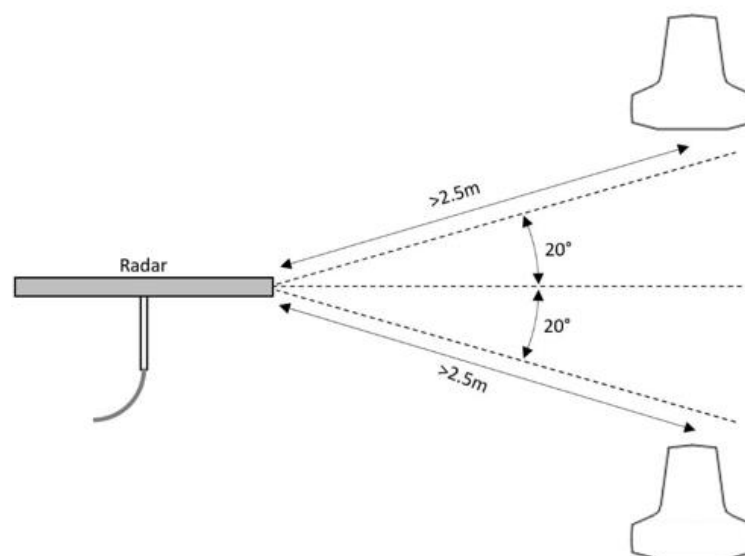


Fig. 1.1-1

Position of SES antenna units relative to radar antenna

The antenna unit shall be mounted minimum 1 m from MF-HF, VHF, and UHF transmitting antennas.

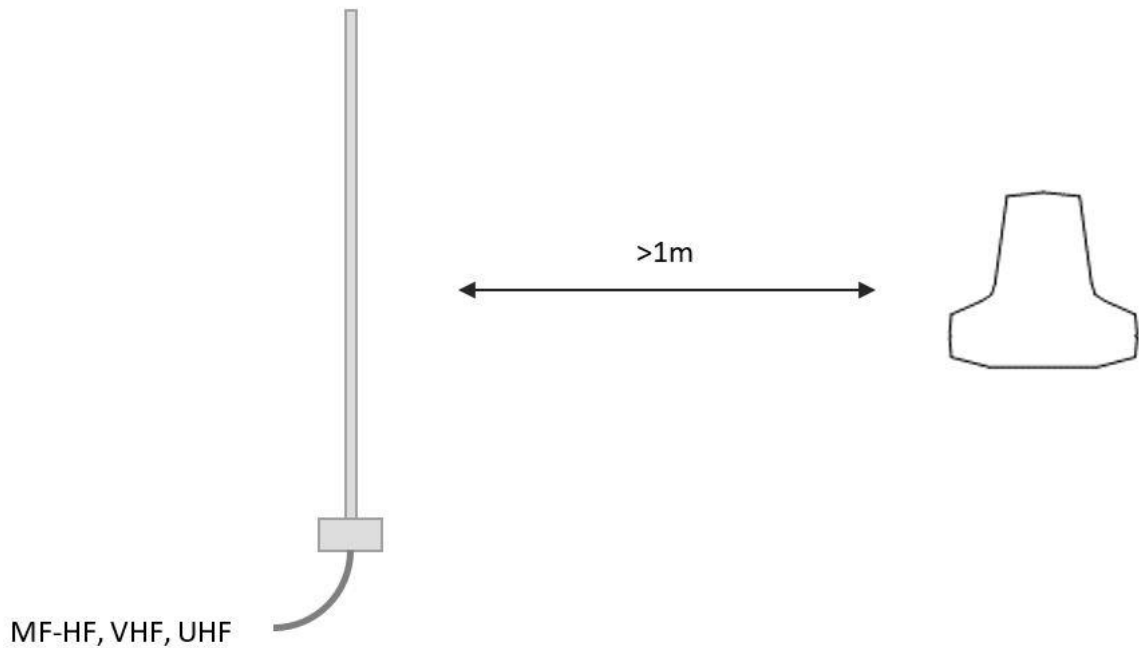


Fig. 1.1-2
Position of SES antenna unit relative to MF-HF, VHF and UHF transmitting antennas

The antenna unit shall be installed with a 360° clear view of the sky. However, minor obstructions such as a mast will not degrade the antenna performance severely, if a separation distance larger than 15 times the diameter of the obstruction is kept.

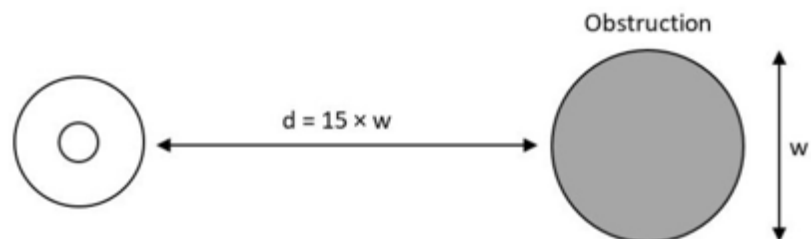


Fig. 1.1-3
Position of SES antenna unit relative to obstruction

The equipment shall be installed and mounted in accordance with the manufacturer's requirements in the technical documentation. If two Iridium antennas are installed, the antennas shall be installed such as to ensure electromagnetic compatibility.

**LIST OF IMO RESOLUTIONS AND CIRCULARS, ITU RECOMMENDATIONS, IEC AND ISO STANDARDS,
OTHER EXTERNAL DOCUMENTS APPLICABLE IN THE PERFORMANCE OF WORK ON TYPE APPROVAL
OF SHIPBORNE RADIO EQUIPMENT ***

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
Radio Equipment				
04120000MK	VHF radio installation ** IV/7.1.1, IV/7.1.2	SOLAS-74 reg. IV/7.1.1, 2 SOLAS-74 reg. X/3 A.694(17) MSC.511(105)/A.803(19) ** MSC.191(79) MSC.302(87) A.524(13) IMO MSC/Circ.862 IMO MSC.1/Circ.1460/Rev.4 IMO COMSAR.1/Circ.32/Rev.2 Radio Regulations 2020 ITU-R M.489-2 (1995) ITU-R M.493-15 (2019) ITU-R M.541-10 (2015)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-3, Ed. 2.0 (2017-10) IEC 61097-7, Ed. 1.1 (2018-01) IEC 61097-8, Ed. 1.0 (1998-09) IEC 62288, Ed. 3.0 (2021-12) IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08) IEC 61162 series: -IEC 61162-1 Ed. 5.0 (2016-08) -IEC 61162-2 Ed. 1.0 (1998-09) -IEC 61162-3 Ed. 1.2 (2014-07) -IEC 61162-450 Ed. 2.0 (2018-05)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04130000MK	MF radio installation ** IV/9.1.1, IV/9.1.2	SOLAS-74 reg. IV/9.1.1, 2 SOLAS-74 reg. X/3 A.694(17) MSC.512(105)/A.804(19) ** MSC.191(79) MSC.302(87) IMO MSC/Circ.862 IMO COMSAR.1/Circ.32/Rev.2 Radio Regulations 2020 ITU-R M.493-15 (2019) ITU-R M.541-10 (2015) ITU-R M.1173-1 (2012)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-8, Ed. 1.0 (1998-09) IEC 61097-9, Ed. 1.0 (1997-11) IEC 61097-3, Ed. 2.0 (2017-10) IEC 62288, Ed. 3.0 (2021-12) IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08) IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04140000MK	MF/HF radio installation ** IV/11.1.1, IV/11.1.2	<p>SOLAS-74 reg. IV/11.1.1, 2 SOLAS-74 reg. X/3</p> <p>A.694(17) MSC.512(105)/A.806(19) ** MSC.508(105) MSC.191(79) MSC.302(87)</p> <p>IMO MSC/Circ.862 IMO COMSAR.1/Circ.32/Rev.2</p> <p>Radio Regulations 2020 ITU-R M.476-5 (1995) ITU-R M.492-6 (1995) ITU-R M.493-15 (2019) ITU-R M.540-2 (1990) ITU-R M.541-10 (2015) ITU-R M.625-4 (2012) ITU-R M.688-0 (1990) ITU-R M.1173-1 (2012)</p>	<p>IEC 60945 series: - IEC 60945 Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007</p> <p>IEC 61097-8, Ed. 1.0 (1998-09) IEC 61097-9, Ed. 1.0 (1997-11) IEC 61097-3, Ed. 2.0 (2017-10)</p> <p>IEC 62288, Ed. 3.0 (2021-12)</p> <p>IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08)</p> <p>IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05)</p> <p>ETS 300 067 (1993-10)</p>	<p>SOLAS-74 reg. IV/14</p> <p>SOLAS-74 reg. X/3</p>

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04150000MK	Inmarsat-C SES ** IV/10.1.1	SOLAS-74 reg. IV/10.1.1 SOLAS-74 reg. X/3 A.570(14) A.694(17) MSC.513(105)/A.807(19) ** MSC.431(98) MSC.302(87) IMO MSC/Circ.862 IMO COMSAR.1/Circ.32/Rev.2	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-4, Ed. 3.2 (2019-06) IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05) IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3
04150300MK	Ship earth station for use in the GMDSS IV/10.1.1	SOLAS-74 reg. IV/10.1 A.694(17) A.813(19) A.1001(25) MSC.434(98) MSC.191(79) MSC.302(87) IMO MSC/Circ.862 IMO COMSAR.1/Circ.32/Rev.2	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-16, Ed. 1.0 (2019-08) IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05) IEC 62288, Ed. 3.0 (2021-12) IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04180000MK	NAVTEX receiver IV/7.1.4	SOLAS-74 reg. IV/7.1.4 SOLAS-74 reg. X/3 A.694(17) MSC.508(105) MSC.191(79) MSC.302(87) IMO COMSAR.1/Circ.32/Rev.2 IMO MSC.1/Circ.1645 Radio Regulations 2020 ITU-R M.540-2 (1990) ITU-R M.625-4 (2012)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-6, Ed. 2.2 (2019-07) IEC 62288, Ed. 3.0 (2021-12) IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05) IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3
04190000MK	EGC receiver IV/7.1.4	SOLAS-74 reg. IV/7.1.4 A.694(17) MSC.306(87) MSC.431(98) MSC.302(87) MSC.191(79) IMO COMSAR.1/Circ.32/Rev.2 IMO MSC.1/Circ.1645	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-4, Ed. 3.2 (2019-06) IEC 62288, Ed. 3.0 (2021-12) IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05) IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04140010MK	HF receiver for MSI and SAR IV/7.1.4	SOLAS-74 reg. IV/7.1.4 A.694(17) MSC.508(105) MSC.191(79) IMO COMSAR.1/Circ.32/Rev.2 IMO MSC.1/Circ.1645 Radio Regulations 2020 ITU-R M.492-6 (1995) ITU-R M.540-2 (1990) ITU-R M.625-4 (2012) ITU-R M.688 (1990)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-9, Ed. 1.0 (1997-11) IEC 62288, Ed. 3.0 (2021-12) IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05) ETS 300 067 (1993-10)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3
04220100MK	Search and rescue locating devices (SRLD): AIS-SART IV/7.1.3, 7.2, 7.3, 7.5	SOLAS-74 reg. IV/7.1.3, 7.2, 7.3, 7.5 A.694(17) MSC.246(83) IMO COMSAR.1/Circ.32/Rev.2 ITU-R M.1371-5 (2014)	IEC 60945 series: - IEC 60945 Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-14, Ed. 1.0 (2010-04)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04300000MK	Integrated communication system (ICS)	A.694(17) MSC.517(105) MSC.191(79) MSC.302(87) IMO COMSAR.1/Circ.32/Rev.2	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 62940 Ed. 1.0 (2016-10) IEC 62288, Ed. 3.0 (2021-12) IEC 62923-1, Ed. 1.0 (2018-08) IEC 62923-2, Ed. 1.0 (2018-08) IEC 61162 series: - IEC 61162-1, Ed. 5.0 (2016-08) - IEC 61162-2, Ed. 1.0 (1998-09) - IEC 61162-3, Ed. 1.2 (2014-07) - IEC 61162-450, Ed. 2.0 (2018-05)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3
04160000MK	Emergency position-indicating radio beacon (EPIRB) IV/7.1.5	SOLAS-74 reg. IV/7.1.5 A.662(16) A.694(17) MSC.471(101) IMO MSC/Circ.862 IMO COMSAR.1/Circ.32/Rev.2 Radio Regulations 2020 ITU-R M.633-4 (2010) ITU-R M.690-3 (2015) ITU-R M.1371-5 (2014)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-2, Ed. 4.0 (2021-06)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04230000MK	Survival craft portable two-way VHF radiotelephone apparatus IV/7.2, 7.3	A.694(17) MSC.515(105) Radio Regulations 2020 ITU-R M.489-2 (1995)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-12, Ed. 1.1 (2017-07)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3
04230001MK	Fixed survival craft two-way VHF radiotelephone apparatus IV/7.2, 7.3	A.694(17) A.809(19) Radio Regulations 2020 ITU-R M.489-2 (1995)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 ETSI EN 301 466 V1.2.1 (2015-12)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

RS nomenclature code	Item designation, SOLAS-74 regulation which determines ship's equipment	SOLAS-74 regulations, IMO resolutions and circulars, ITU recommendations which the item shall comply with	List of documents in the field of standardization and other documents, whose application, on a voluntary basis, provides compliance with the requirements that the item shall meet (testing standards)	Requirements for type approval of the item
04021200MK	Aeronautical two-way VHF radio telephone apparatus IV/7.6	SOLAS-74 reg. IV/7.6 A.694(17) MSC.80(70) MSC.516(105) IMO COMSAR.1/Circ.32/Rev.2 Radio Regulations 2020 ICAO Convention on International Civil Aviation, Annex 10	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 ETSI EN 301 688 V1.2.1 (2016-03)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3
04220000MK	Search and rescue locating devices (SRLD): Radar SART IV/7.1.3, 7.2, 7.3, 7.5	SOLAS-74 reg. IV/7.1.3, 7.2, 7.3, 7.5 A.694(17) MSC.510(105) ITU-R M.628-5 (2012)	IEC 60945 series: - IEC 60945, Ed. 4.0/Cor.1 (2008-04) - GOST R IEC 60945-2007 IEC 61097-1, Ed. 2.0 (2007-06)	SOLAS-74 reg. IV/14 SOLAS-74 reg. X/3

* For application of resolutions MSC.508(105), MSC.511(105), MSC.512(105), MSC.513(105), MSC.515(105), MSC.516(105) and MSC.517(105), the phrase "installed on or after 1 January 2024" means the following:

(a) for ships for which the building contract is placed on or after 1 January 2024, or in the absence of the contract, the keel of which is laid or at a similar stage of construction on or after 1 January 2024, "installed on or after 1 January 2024" means any installation on the ship;

(b) for ships not listed in item (a) above, "installed on or after 1 January 2024" means a contractual delivery date for the equipment or, in the absence of the contractual delivery date, the actual delivery of the equipment to the ship on or after 1 January 2024.

Revised performance standards specified in the Annex to resolution MSC.510(105) (search and rescue radar transponders) shall apply to:

(c) the equipment installed on ships for which the building contract is placed on or after 1 January 2024, or, in the absence of the contract, for ships the keels of which is laid or which are at the similar stage of construction on or after 1 January 2024; and

(d) for ships other than ships specified in item (c) above, the equipment with a contractual delivery date on or after 1 January 2024 or, in the absence of a contractual date, an actual delivery date of the equipment to the ship on or after 1 January 2024.

** Refer to IMO circular MSC.1/Circ.1676 dated 30.06.2023.

Nos	Equipment	RS nomenclature code	Several options of ship navigation areas								Inner road	Outer road
			A1	A1, A2	A1, A2, A3	A1, A2, A3, A4	A1, A3	A1, A3, A4	A1, A4	A1, A2, A4		
Duplicated equipment (if applicable)												
10	VHF radio installation ⁴	04120000MK	1⁴	1⁴	1⁴	1⁴	1⁴	1⁴	1⁴	1⁴		
11	MF radio installation ⁴	04130000MK		1^{1,4}	1^{1,4}							
12	MF/HF radio installation	04140000MK				1^{1,3}		1³	1	1		
13	RMSS SES	04150300MK 04150000MK			1³		1³					

¹ MF/HF radio installation may be used.

² NAVTEX receiver is mandatory if the ship is engaged on voyages in any area covered by the international NAVTEX service. An HF MSI/SAR receiver or EGC receiver providing MSI/SAR receipt in the areas of ship operation is mandatory, if the ship is engaged on voyages in areas not covered by the international NAVTEX service.

³ MF/HF radio installation is permitted instead of RMSS SES.

⁴ DSC watch-keeping receiver is not required.