



# *MARINE ORDERS*

## *Part 27*

### *Radio Equipment*

#### *Issue 2*

Order No. 9 of 2002

Pursuant to Section 425(1AA) of the *Navigation Act 1912*, I hereby make this Order repealing Marine Orders, Part 26, Issue 4 and Part 27, Issue 1, and substituting the attached Marine Orders, Part 27, Issue 2, to come into operation on 1 July 2002.

Roger Timms  
Acting Chief Executive Officer  
21 June 2002

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### *Previous issues*

#### **Part 27, Issue 1, Order No 6 of 1995**

- *Amendment, Order No. 10 of 1998*
- *Amendment, Order No. 5 of 1999*
- *Amendment, Order No. 4 of 2000*

## 1 Purpose

**1.1** Section 191 of the *Navigation Act 1912* provides for the regulations to give effect to Chapter IV of SOLAS. Section 231A provides that a ship must comply with the regulations and orders with respect to radio installations. Section 231B provides that a ship must be provided with such persons qualified to operate the radio installations of a ship as are prescribed. Section 231C provides for the regulations to specify the manner in which a radio installation is used and maintained. Section 231E provides for the regulations to prescribe matters in relation to radio log books. Section 231F provides for the regulations to make provision for the equipping of ships with radio installations and the operation, maintenance and use on ships of radio installations. Subsection 425(1) of the *Navigation Act 1912* provides for regulations to be made prescribing matters requiring or permitted to be prescribed, or which are necessary or convenient to be prescribed for carrying out or giving effect to the Act.

**1.2** Section 425(1AA) of the *Navigation Act 1912* provides for the making of orders with respect to matters than can be made by the regulations. This Part of Marine Orders therefore provides for the matters referred to in 1.1.

## 2 Definitions of words and phrases used in this Part

**AMSA** means the Australian Maritime Safety Authority established by the *Australian Maritime Safety Authority Act 1990*;

**approved**, means approved by the Chief Marine Surveyor or a survey authority for the purposes of this Part, the approval being subject to such conditions as are considered necessary;

**at sea**, in relation to radio watch-keeping, means the period occupied in a voyage between the berth at one port of call and the berth at the next port of call;

**Chief Marine Surveyor** means the person occupying the position of Manager, Ship Inspections, in AMSA or, in respect of any particular purpose under this Part, a suitably qualified person authorised by the Manager, Ship Inspections, for that purpose;

**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 ITU-R;

**direct-printing telegraphy** means automated telegraphy techniques which comply with the relevant recommendations of the ITU-R;

**DSC Watchkeeping receiver** means a radio installation maintaining a continuous watch on one or more specified DSC frequencies;

**EPIRB** means an approved emergency position-indicating radio beacon;

**General Manager** means the person occupying the position of General Manager, Maritime Operations, in AMSA;

**general radiocommunications** means operational and public correspondence traffic, other than distress, urgency and safety messages, conducted by radio;

**GMDSS Operator's Certificate** means a GMDSS Operator's Certificate issued under Marine Orders, Part 3;

**SOLAS ship** means:

- a ship to which Chapter IV of SOLAS apply, or would apply if SOLAS was in force for the country whose flag the ship flies; and
- for the purposes of this Part, any other ship fitted with GMDSS equipment that meets the requirements of Chapter IV of SOLAS;

**IMO** means the International Maritime Organization;

**INMARSAT** means the Organization established by the Convention on the International Maritime Satellite Organization (INMARSAT) adopted on 3 September 1976;<sup>1</sup>

**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;

**ITU-R** means the International Telecommunication Union—Radiocommunication Sector;

**locating** means the finding of ships, aircraft, units or persons in distress;

**Manager** means the person occupying the position of Manager, Ship Operations and Qualifications, in AMSA, or in respect of any particular purpose under this Part, a suitably qualified person authorised by the Manager, Ship Operations and Qualifications, for that purpose;

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<sup>1</sup> The name of the Organization was changed to *International Mobile Satellite Organization (Inmarsat)* in 1994.

**maritime safety information (MSI)** means navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to ships;

**Navigation Act** means the *Navigation Act 1912*;

**non-SOLAS ship** means a ship that is not a SOLAS ship, but does not include a ship normally engaged on harbour duties;

**penal provision** means a penal provision for the purposes of Regulation 4 of the Navigation (Orders) Regulations;<sup>2</sup>

**Radio Regulations** means the Radio Regulations annexed to, or regarded as being annexed to, the International Telecommunication Convention as in force on 1 July 2002;

**sea area A1** means an area within the VHF radiotelephone coverage area of any coast station providing a continuous DSC alerting service on VHF frequency 156.525 MHz;

**sea area A2** means an area, excluding sea area A1, within the MF radiotelephone coverage area of any coast station providing a continuous DSC alerting service on MF frequency 2187.5 KHz;

**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;

**sea area A4** means an area outside sea areas A1, A2 and A3;

**SOLAS** means the Safety Convention as defined in the *Navigation Act 1912*;

**STCW Code** means the Seafarers' Training, Certification and Watchkeeping (STCW) Code, as adopted by the 1995 Conference of Parties to the STCW Convention as Resolution 2;

**STCW Convention** means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended.

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<sup>2</sup> Regulation 4 of the Navigation (Orders) Regulations provides that a person who contravenes a provision of an order made under subsection 425(1AA) of the *Navigation Act 1912* that is expressed to be a penal provision is guilty of an offence and is punishable, upon conviction:—

- (a) if the offender is a natural person—by a fine not exceeding \$2,000; or
- (b) if the offender is a body corporate—by a fine not exceeding \$5,000.

By virtue of sections 4AB and 4AA of the *Crimes Act 1914*, these penalties are now \$2,200 and \$5,500 respectively.

**survey authority** means a survey authority approved for the purposes of the Navigation Act.<sup>3</sup>

All other terms and abbreviations which are used in this Part and which are defined in the Radio Regulations have the meanings as defined in those Regulations.

### 3 Interpretation

**3.1** In this Part, a reference to the date on which the keel of a ship which was laid means the date on which not less than 50 tonnes or one per cent of the proposed total mass of the structural material of the ship, whichever is the less, has been assembled.

**3.2** The expression **to the satisfaction of the Chief Marine Surveyor**, or any similar expression appearing in this Part, means that the Chief Marine Surveyor may require the fitting, material, appliance or apparatus referred to, to be demonstrated to be safe and effective for its intended purpose.

**3.3** Where in this Part there is a requirement for an EPIRB to be installed close to, or be remotely activated from, the position from which the ship is normally navigated, the requirement may be met by installing in such a position an EPIRB, which may be:

- the sole EPIRB, in which case it must meet all the requirements of this Part relating to an EPIRB; or
- a supplementary EPIRB, in which case it need not be float-free.

**3.4** To the extent that, in relation to an item of equipment, this Part does not specify, or specifies only in part, requirements for inspection, testing, maintenance or replacement, any requirement for inspection, testing, maintenance or replacement specified by the manufacturer must be followed.

**3.5** In this Part:

- headings and sub-headings are part of the Part;
- each Appendix is part of the Part;
- a footnote is not part of the Part, but may provide additional information or guidance in applying the Part.

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<sup>3</sup> The following survey authorities are approved: American Bureau of Shipping; Bureau Veritas; Det Norske Veritas; Germanischer Lloyd; Lloyd's Register of Shipping; and Nippon Kaiji Kyokai.

## 4 Application

4.1 This Part applies to a ship:

- registered in Australia; or
- registered in a country other than Australia, while it is in the territorial sea of Australia or waters on the landward side of the territorial sea.

4.2 This Part does not apply to a SOLAS ship registered in a country other than Australia, except to the extent that the ship fails to comply with SOLAS.

4.3 Nothing in this Part is intended to 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.

## 5 Exemptions & equivalents<sup>4</sup>

5.1 The Chief Marine Surveyor may grant partial or conditional exemption to individual ships from applicable requirements of this Part, provided:

- such ships comply with the functional requirements specified in 7; and
- that officer has taken into account the effect the exemption may have upon the general efficiency of the service for the safety of all ships.

5.2 An exemption may be granted under 5.1 only:

- if the conditions affecting safety are such as to render full compliance with the applicable requirements of 8 unreasonable or unnecessary; or
- in exceptional circumstances, for a single voyage outside the sea area or sea areas for which the ship is equipped.

5.3 If a non-SOLAS ship is required, under exceptional circumstances, to undertake an international voyage to which Chapter IV of SOLAS applies, the Chief Marine Surveyor may exempt the ship from any of the requirements of Chapter IV of SOLAS in accordance with Regulation 4(b) of Chapter I of SOLAS.

5.4 Where a provision of this Part requires a particular fitting, material, appliance or apparatus, or type thereof to be fitted or carried in a ship or a particular provision to be made in a ship, the Chief Marine Surveyor may allow any other fitting, material,

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<sup>4</sup> The Chief Marine Surveyor may seek additional information to assist in reaching a decision.

appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made, if that officer is satisfied that the other fitting, material, appliance or apparatus, or type thereof, or provision, is at least as effective as that required by that provision of this Part.

**5.5** Application for an exemption under 5.1 or the allowance of an equivalent under 5.4 must be made in writing to the Chief Marine Surveyor and must be accompanied by such information as the Chief Marine Surveyor requires to enable that officer to make a proper decision.

**5.6** An exemption granted or recognised under a provision of Marine Orders, Part 26, Issue 4, or Marine Orders, Part 27, Issue 1, and in force immediately before this issue came into force, is to continue in force as if granted under this issue.

## **6 Review of decisions**

### **6.1 Internal review**

**6.1.1** If the Chief Marine Surveyor or the Manager makes a decision under this Part, a person affected by the decision may apply to the General Manager for review of that decision.

**6.1.2** An application for internal review under 6.1.1 must be made in writing to the General Manager and must be accompanied by such information as the General Manager requires to enable that officer to make a proper decision.

**6.1.3** The General Manager may:

- affirm the original decision by the Chief Marine Surveyor or the Manager; or
- make any decision that could be made by the Chief Marine Surveyor or the Manager in accordance with this Part.

### **6.2 Review by the AAT**

**6.2.1** Application may be made to the Administrative Appeals Tribunal for review of a decision by the General Manager under 6.1.3.

**6.2.2** The General Manager must give his or her decision in writing within 28 days of receiving the application for internal review. The notice must include a statement to the effect that, if the person is dissatisfied with the decision, application may, subject to the *Administrative Appeals Tribunal Act 1975*, be made to the Administrative Appeals Tribunal for review of the decision. The notice must also include a statement to the effect that the person may request a statement under section 28 of that Act.

**6.2.3** Failure to comply with 6.2.2 in relation to a decision does not affect the validity of that decision.

## 7 Functional Requirements

**7.1** Every SOLAS ship, while at sea, must be capable of meeting the functional requirements set out in regulation 4 of Chapter IV of SOLAS.

**7.2** Every non-SOLAS ship, while at sea, must be capable of providing for the safety of the ship, particularly the ability to:

- perform ship-to-shore distress alerting by two independent means;
- transmit ship-to-ship distress alerting;
- transmit and receive on-scene communications, including appropriate SAR coordinating communications;
- transmit locating signals, unless the Chief Marine Surveyor determines that the nature of the ship's operations makes this requirement unnecessary; and
- receive maritime safety information.

The installation on the ship must be capable of assisting other ships in distress, particularly the ability to:

- receive shore-to-ship distress alerting; and
- receive ship-to-ship distress alerting.

## 8 Specific requirements

**8.1** The radio installations<sup>5</sup>, equipment, watchkeeping arrangements, sources of energy, performance standards<sup>6</sup>, maintenance requirements,<sup>7</sup> personnel<sup>8</sup> and record-keeping<sup>9</sup> of

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<sup>5</sup> Station frequencies are listed in Appendix 1.

<sup>6</sup> A recent list of IMO performance standards is at Appendix 2. Performance standards for radiotelephone installations, climatic and durability tests and ship earth stations are set out in the Appendixes 3, 4 and 5, respectively.

<sup>7</sup> If shore-based maintenance is selected as one of the methods to ensure that the functional requirements are met, then the interval between maintenance inspections should not exceed six months. It should be recognized that, despite the use of other methods, some reliance on shore-based maintenance to enable availability of the functional requirements of the GMDSS would always be necessary.

<sup>8</sup> The personnel arrangements specified in Appendix 6 are regarded as meeting the requirements of regulation 16 of Chapter IV of SOLAS.

<sup>9</sup> The records required by 8.1 are to include: all messages relating to distress, urgency or safety received by the ship; all test calls; battery specific gravity checks; details of any commercial traffic exchanged with a coastal radio station via MF, HF or VHF radio. Radio log books are available from AMSA offices.

a SOLAS ship must comply with the relevant provisions of regulations 6 to 18 (inclusive) of Chapter IV of SOLAS, the Radio Regulations, the STCW Convention and the STCW Code.<sup>10</sup>

**8.2** The radio installations,<sup>11</sup> equipment, watchkeeping arrangements, sources of energy,<sup>12</sup> performance standards,<sup>13</sup> maintenance requirements,<sup>14</sup> personnel and record-keeping of a non-SOLAS ship must be such as to adequately enable the functional requirements set out in 7.2 to be met,<sup>15</sup> and comply with the relevant provisions of the Radio Regulations, the STCW Convention and the STCW Code.<sup>16</sup>

**8.3** For the purposes of section 231E of the Navigation Act, Appendix 8 specifies the prescribed form of a radio log-book.<sup>17</sup>

**8.4** A ship normally engaged in harbour duties must:<sup>18</sup>

- be fitted with a VHF radio installation complying with A1(a) and A1(b) of Appendix 7; and
- be provided with an approved 406 MHz or 1.6 GHz satellite EPIRB.

**8.5** There must be carried on a ship:

- the Safety Radio, or Radio, Certificate, the Record of Equipment, any applicable Certificate of Exemption, and other relevant statutory certificates;
- a copy of:

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<sup>10</sup> See Marine Orders, Part 28.

<sup>11</sup> Examples of installations that will meet the functional requirements are in Appendix 7.

<sup>12</sup> If the source of energy as required by regulation IV/13.1 of SOLAS consists of a rechargeable accumulator battery or batteries then the reserve source(s) of energy as required by regulation IV/13.2 of SOLAS may be exempted provided that such source(s) of energy meets all the relevant requirements of regulation IV/13 of SOLAS.

<sup>13</sup> Radio equipment fitted to a non-SOLAS ship should be GMDSS type-approved and meet the appropriate performance standard listed in Appendix 2.

<sup>14</sup> To ensure that the functional requirements are met in respect of a ship, there must be in place either shore-based maintenance arrangements or at-sea maintenance capability. Although the interval between shore based maintenance inspections is normally not to exceed 6 months, the Chief Marine Surveyor may extend this period beyond 6 months.

<sup>15</sup> The radio installations, watchkeeping arrangements, sources of energy, maintenance requirements, personnel and record-keeping of a non-SOLAS ship should, as far as possible, meet the relevant standards applicable to SOLAS ships. However, alternative ways of meeting the functional requirements may be acceptable.

<sup>16</sup> See Marine Orders, Part 28.

<sup>17</sup> Radio log books are available from AMSA offices.

<sup>18</sup> The operations of these vessels are normally not within the jurisdiction of the Navigation Act 1912. However, under s.187AA of that Act, they may be issued with certificates of equipment and provision 8.4 has been included for that purpose.

- the current edition of the *Marine Radio Operators Handbook*, published by the Australian Communications Authority; or
- the current edition of the handbook for GMDSS ship station operators, published by AMSA;
- a copy of this Part of Marine Orders;
- a copy of the current edition of the *Manual for use by the Maritime Mobile and the Maritime Mobile-Satellite Services*, published by the International Telecommunication Union;<sup>19</sup>
- a copy of the current edition of the *Admiralty List of Radio Signals*, published by the Hydrographer of the Navy (UK);<sup>19</sup>
- a copy of the current edition of the *List of Ship Stations*, published by the International Telecommunications Union;<sup>19</sup>
- a copy of the current edition of the *List of Call Signs and Numerical Identities of Stations used by the Maritime Mobile Satellite Services*, published by the International Telecommunication Union;<sup>19</sup> and
- the ship's Radio Log Book.

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<sup>19</sup> Depending on the nature of the voyage and the area of operation, it may be possible to exempt a non-SOLAS ship from compliance with this requirement.

## Appendix 1

## Station frequencies for GMDSS communications

## A — Distress and Safety

	<i>Ship Transmit Frequency</i>	<i>Ship Receive Frequency</i>	<i>Remarks</i>
<b>A.1 Radiotelephone frequencies</b>			
	2182 kHz	2182 kHz	
	4125 kHz	4125 kHz	
	6215 kHz	6215 kHz	
	8291 kHz	8291 kHz	
	12290 kHz	12290 kHz	
	16420 kHz	16420 kHz	
	156.800 MHz	156.800 MHz	<b>VHF Marine channel 16</b>
	156.375 MHz	156.375 MHz	<b>VHF Marine channel 67 — supplementary distress for Australia only</b>
<b>A.2 Digital Selective Calling (DSC) frequencies</b>			
	2187.5 kHz	2187.5 kHz	
	4207.5 kHz	4207.5 kHz	
	6312.0 kHz	6312.0 kHz	
	8414.5 kHz	8414.5 kHz	
	12577.0 kHz	12577.0 kHz	
	16804.5 kHz	16804.5 kHz	
	156.525 MHz	156.525 MHz	<b>VHF marine channel 70</b>
<b>A.3 Narrow Band Direct Printing Telegraphy (NBDP) frequencies</b>			
	2174.5 kHz	2174.5 kHz	
	4177.5 kHz	4177.5 kHz	
	6268.0 kHz	6268.0 kHz	
	8376.5 kHz	8376.5 kHz	

	<i>Ship Transmit Frequency</i>	<i>Ship Receive Frequency</i>	<i>Remarks</i>
	12520.0 kHz 16695.0 kHz	12520.0 kHz 16695.0 kHz	
<b>A.4 Air-sea SAR communications Radiotelephone</b>			
	4125.0 kHz 3023.0 kHz 5680.0 kHz 156.300 MHz	4125.0 kHz 3023.0 kHz 5680.0 kHz 156.300 MHz	<b>First preference</b> <b>Second preference</b> <b>Third preference</b> <b>VHF marine channel 6</b>
<b>A.5 Inter-ship Navigation and Safety Communications</b>			
	156.650 MHz	156.650 MHz	<b>VHF marine channel 13</b>

**B - Maritime Safety Information**

	<i>Ship Transmit Frequency</i>	<i>Ship Receive Frequency</i>	<i>Remarks</i>
<b>B.1 HF Narrow Band direct Printing Telegraphy (NBDP) frequencies</b>			
		4210.0 kHz 6314.0 kHz 8416.5 kHz 12579.0 kHz 16806.5 kHz	
<b>B.2 NAVTEX (not used in Australia)</b>			
		518.0 kHz 490.0 kHz 4209.5 kHz	

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(Continued)

## Appendix 2

### Performance Standards

The following performance standards promulgated by the International Maritime Organization will be used in approving equipment under this Part. Copies of the standards are obtainable from the Authority.

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IMO Resolution	Subject
A.525(13)	Narrow-band direct printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships
A.570(14)	Type approval of ship earth stations
A.662(16)	Float-free release and activation arrangements for emergency radio equipment
A.664(16)	Enhanced group call equipment
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
A.696(17)	Type approval of satellite emergency position-indicating radio beacons (EPIRBs) operating in the COSPAS-SARSAT system
A.700(17)	Narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships
A.702(17)	Radio maintenance guidelines for the GMDSS related to sea areas A3 and A4
A.802(19)	Survival craft radar transponders for use in search and rescue operations

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A.803(19) ‡	VHF radio installations capable of voice communication and digital selective calling
A.804(19) ‡	Shipborne MF radio installations capable of voice communication and digital selective calling*
A.805(19)	Float-free VHF emergency position-indicating radio beacons
A.806(19) ‡	Shipborne MF/HF radio installations capable of voice communication, narrow-band direct printing and digital selective calling
A.807(19) ‡	INMARSAT Standard-C ship earth stations capable of transmitting and receiving direct-printing communications
A.808(19)	Ship earth stations capable of two-way communications
A.809(19)	Survival craft two-way VHF radiotelephone apparatus
A.810(19) †	Float-free satellite emergency position-indicating radio beacons (EPIRB) operating on 406 MHz
A.811(19)	Shipborne integrated radiocommunication system (IRCS) when used in the GMDSS
A.812(19)	Float-free satellite emergency position-indicating radio beacons operating through the geostationary INMARSAT satellite system on 1.6 GHz
A.813(19)	Electromagnetic compatibility (EMC) for all electrical ship's equipment
MSC.80(70) Annex 1	Performance standards for on-scene (aeronautical) portable two way VHF radiotelephone apparatus

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‡ as amended by IMO Resolution MSC.68(68).

\* The normal ship to ship range on 2 MHz of MF or MF/HF transmitting equipment installed to meet the functional requirements of 7 of this Part is a minimum of 150 nautical miles. The normal ship-to-ship range is the distance to which signals can be transmitted over the sea by day on 2182 kHz to set up at a receiver by unmodulated carrier a total RMS field strength of not less than 25 millivolts per metre. This will be complied with when the RMS field strength obtained at a distance over sea water of one nautical mile from the ship, and independent of the ship's heading, is 7 millivolts per metre.

† as amended by IMO Resolutions MSC.56(66) and MSC.120(74).

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(Continued)

## Appendix 3

### Radiotelephone Installation

#### 1 Technical requirements for MF/HF equipment

MF/HF radiotelephone equipment provided in accordance with this Part must, in addition to meeting the performance standards set out in Appendix 2, be capable of operation on the MF and HF Air-sea Search and Rescue radiotelephone frequencies, as detailed in Appendix 1, section A4.

#### 2 Technical requirements for VHF equipment

**2.1** A VHF installation must be capable of transmission and reception of frequency modulated signals on the frequencies of:

- (a) 156.300 MHz (channel 6);
- (b) 156.650 MHz (channel 13);
- (c) 156.800 MHz (channel 16);
- (d) 156.375 MHz (channel 67); and
- (e) other frequencies in the VHF maritime mobile band that are appropriate to the service in which the ship is engaged.

**2.2** VHF equipment provided in accordance with this Part must, in addition to meeting the requirements of Appendix 2, be such that priority of use and control of the channels required for navigational safety purposes is immediately available at the place from which the ship is normally navigated.

#### 3 Climatic and durability requirements for MF/HF equipment

**3.1** MF/HF radiotelephone equipment must meet the climatic and durability requirements of Appendix 4.

**3.2** For the purpose of Appendix 4, radiotelephone equipment is considered to be Class B equipment.

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## Appendix 4

### Climatic and Durability Tests

#### 1 General

##### 1.1 Category of equipment

In this Appendix, a reference to:

**class B equipment** means equipment that is normally installed in a protected area; and

**class X equipment** means equipment that is normally stored or intended to be used in exposed positions.

##### 1.2 Order of tests

Class B and class X equipment must be subjected to the tests indicated in the following table in the order listed:

<i>Class B equipment tests</i>		<i>Class X equipment tests</i>	
1	Vibration test	1	Vibration test
2	Dry heat test	2	Dry heat test
3	Damp heat test	3	Damp heat test
4	Low temperature test	4	Low temperature test
5	Corrosion test (salt water)	5	Rain test
		6	Corrosion test (salt water)
		7	Mould growth test

#### 2 Details of Tests

##### 2.1 Vibration test

**2.1.1** The equipment, complete with covers and shock absorbers, if any, must be clamped to a vibration table.

**2.1.2** The table must be vibrated at all frequencies between 5 and 12.5 hertz at an amplitude of plus and minus 1.6 millimetres while the equipment is kept operating continuously.

**2.1.3** The table must be so vibrated for 3 periods, each of 8 minutes duration.

**2.1.4** The direction of the vibration during each one of the periods referred to in 2.1.3 of this Appendix must be perpendicular to the direction of the vibration of the other 2 periods.

## **2.2 Dry heat test**

**2.2.1** Class B equipment must be placed in a chamber that is maintained at a constant temperature of  $55^{\circ}\text{C}\pm 1^{\circ}\text{C}$  and kept operating at that temperature for a period of 2 hours.

**2.2.2** In the case of medium and high frequency radiotelephone transmitting equipment, the transmitter must be adjusted to transmit an output level of 6 decibels below the rated power output of the equipment using class J3E emission, when driven by 2 audio frequency tones of equal levels.

**2.2.3** Class X equipment must be placed in a chamber that is maintained at a constant temperature of  $70^{\circ}\text{C}\pm 1^{\circ}\text{C}$  for 10 hours and is then cooled to a constant temperature of  $55^{\circ}\text{C}\pm 1^{\circ}\text{C}$ , the equipment being kept operating at the latter temperature for 2 hours.

## **2.3 Damp heat test**

**2.3.1** The equipment must be placed in a chamber that must, within a period not exceeding 2 hours, be heated from room temperature to  $40^{\circ}\text{C}$  and brought to a relative humidity of at least 95 per cent.

**2.3.2** The chamber must be kept at a temperature of  $40^{\circ}\text{C} \pm 1^{\circ}\text{C}$  and a relative humidity of at least 95 per cent for a period of 12 hours.

**2.3.3** At the beginning of the last hour of the period of 12 hours, all accessible surfaces and components must be wiped dry and any fans or drying heaters provided in the equipment must be switched on.

**2.3.4** After the fans or drying heaters have been in operation for 30 minutes and while the temperature in the chamber is still  $40^{\circ}\text{C}$ , the equipment must be operated and checked.

**2.3.5** The temperature of the chamber must then, in preparation for the low temperature test, be allowed to fall below 25°C, the equipment being retained in the chamber.

## **2.4 Low temperature test**

**2.4.1** Class B equipment must be placed in a chamber that must be maintained at a temperature of -15°C ±2°C at normal atmospheric pressure for a period of not less than 12 hours.

**2.4.2** Class X equipment must be placed in a chamber that must be maintained at a temperature of -25°C ±2°C at normal atmospheric pressure for a period of not less than 12 hours.

**2.4.3** During the last 30 minutes of low temperature tests the equipment must be operated and checked at the controlled temperature.

## **2.5 Rain test**

**2.5.1** Class X equipment must be placed in a chamber fitted with 8 shower heads, the discharge end of which consists of a flat, non-corrodible metal plate 1.6 millimetres thick, having 36 holes each of 1 millimetre diameter evenly spaced in concentric circles as follows:

16 holes on the periphery of a 51 mm diameter circle;

8 holes on the periphery of a 38 mm diameter circle;

8 holes on the periphery of a 25 mm diameter circle; and

4 holes on the periphery of a 13 mm diameter circle.

**2.5.2** The shower heads must be arranged at a distance of between 500 mm and 800 mm from the equipment in such a manner that spray from 4 of the shower heads is directed downwards at an angle of 45° at each of the uppermost corners of the equipment and the spray from the other 4 shower heads is directed horizontally at the centre of each area of the 4 sides of the equipment.

**2.5.3** Fresh water at room temperature and at a static pressure of between 100 kilopascals and 175 kilopascals must be sprayed on the equipment from the shower heads for a period of one hour.

**2.5.4** In this test the equipment must be:

- (a) placed in its normal upright position as though for operation purposes; and
- (b) rotated at a rate of between 12 and 20 revolutions per minute.

## 2.6 Salt water corrosion test

**2.6.1** The equipment must be placed in a chamber fitted with apparatus capable of spraying a fine mist of either natural sea water, or water that contains, within a tolerance of plus or minus 10 per cent, the following percentages of salts in solution:

Sodium Chloride	2.7%;
Magnesium Chloride	0.6%;
Calcium Chloride	0.1%; and
Potassium Chloride	0.07%.

**2.6.2** The spraying apparatus must be so arranged that the products of corrosion cannot mix with the sea water or solution contained in the spray reservoir.

**2.6.3** The equipment must be sprayed on all its external surfaces with the sea water or solution for a period of one hour and must be kept working continuously for the last 30 minutes of that hour.

**2.6.4** The equipment must then be immediately stored for a period of 7 days at a temperature of 40°C and at a relative humidity of between 60% and 80%.

**2.6.5** The equipment must be so sprayed and stored on 4 separate occasions.

## 2.7 Mould growth test

**2.7.1** Class X equipment must be inoculated by spraying with an aqueous suspension of mould spores containing all of the following cultures:

- Aspergillus niger;
- Aspergillus terreus;
- Aureobasidium pullulans;
- Paecilomyces varioti;
- Pencillium funiculosum;
- Pencillium ochrochloron;
- Scopulariopsis brevicaulis; and
- Trichoderma viride.

**2.7.2** Immediately after spraying, the equipment must be placed in a chamber the temperature of which must be maintained at 29°C ±1°C at a relative humidity of not less than 95%.

**2.7.3** The equipment must remain in the chamber for a period of 28 days.

### **3 Details of Requirements**

Equipment subjected to the tests required by this Appendix pass those tests if:

- (a) the equipment operates satisfactorily during the vibration and dry heat tests;
- (b) the equipment operates satisfactorily in the operational checks required in the damp heat and low temperature tests;
- (c) immediately after the conclusion of the salt water corrosion tests, there are no signs of undue corrosion or deterioration and the equipment operates normally; and
- (d) in the case of class X equipment, the equipment:
  - (i) operates satisfactorily immediately after the conclusion of the rain test; and
  - (ii) shows no signs of harmful mould growth and operates satisfactorily immediately after the conclusion of the mould growth test.

\* \* \* \* \*

## Appendix 5

### Ship Earth Stations

#### 1 Definitions

In this Appendix:

**IMO** means the International Maritime Organization;

**INMARSAT** means the International Maritime Satellite Organization; and

**ship earth station** means any means of transmitting and receiving radio or other signals by way of the INMARSAT system of international communication.

#### 2 Specifications

The installation of a ship earth station must comply with such specifications of the following publications as have application to the installation of that equipment, so far as it is practicable to ensure the greatest possible operational safety:

- (a) IMO Resolution A.694(17): General requirements for shipborne radio equipment forming part of the Global Maritime Distress and Safety System and for electronic navigational aids;
- (b) IMO Resolution A.808(19): Performance standards for ship earth stations;
- (c) IMO Resolution A.807(19): Performance standards for INMARSAT C ship earth stations capable of transmitting and receiving direct-printing communications;
- (d) International Electrotechnical Commission Publication IEC 60533: Electrical and Electronic Installations in Ships—Electromagnetic Compatibility; and
- (f) Standards Association of Australia AS 2772 Part 1 1990: (Radio Frequency Radiation) Maximum Exposure Levels — 100 kHz to 300 GHz.<sup>20</sup>

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<sup>20</sup> This standard is currently being reviewed.

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## Appendix 6

### Radio Personnel

- 1 Each person in charge of a navigational watch and each person in charge of or performing radio duties must hold a valid GMDSS General Operators Certificate.
- 2 If a ship uses the option of at-sea electronic maintenance to guarantee the functional requirements, at least one person on board is required to hold either a valid GMDSS First Class Radio Electronic Certificate or a valid GMDSS Second Class Radio Electronic Certificate.
- 3 Subject to 5, on a passenger ship at least one person other than the Master and Deck Officers must hold a valid GMDSS General Operators Certificate.
- 4 One of the persons specified in 1, 2 or 3 must be designated on the Muster List as having primary responsibility for radio communications during distress situations.
- 5 Where on a passenger ship sufficient deck officers are available to cover all other roles normally filled by deck officers during emergencies or distress situations, the Manager may accept a deck officer as the person having primary responsibility for radio communications during distress situations.

\* \* \* \* \*

## Appendix 7

### GMDSS equipment for non-SOLAS ships

The following are examples of radio installations<sup>21</sup> on a non-SOLAS ship that will meet the functional requirements of 7.2:

#### A. On Australian coastal voyages (sea area A3):

##### A.1: Option 1

- (a) A VHF radio installation with DSC capability;\*
- (b) A DSC watchkeeping receiver for VHF channel 70 which may be separate or combined with the VHF radio installation above;
- (c) A MF radio installation with DSC capability;
- (d) A MF DSC watchkeeping receiver capable of maintaining a continuous DSC watch on 2187.5 kHz which may be separate or combined with the MF radio installation above;
- (e) An INMARSAT ship earth station capable of:
  - transmitting and receiving distress and safety communications using direct-printing telegraphy;
  - initiating and receiving distress priority calls;
  - transmitting and receiving general radio communications, using either radiotelephony or direct-printing telegraphy;
  - receiving Maritime Safety Information (MSI) using enhanced group calling;
- (f) A 406 MHz EPIRB;
- (g) Hand held VHF radiotelephone apparatus fitted with VHF channel 6, 13, 16 and 67;<sup>†</sup> and
- (h) 9 GHz radar transponder(s), unless the Chief Marine Surveyor determines that the nature of the ship's operations makes this requirement unnecessary.<sup>†</sup>

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<sup>21</sup> Specifications and performance standards of various radio and communication equipment shall be in accordance with requirements outlined in SOLAS Chapter IV.

**A2: Option 2**

- (a) A VHF radio installation with DSC capability;\*
- (b) A DSC Watchkeeping receiver for VHF channel 70 which may be separate or combined with the VHF radio installation above;
- (c) A MF/HF radio installation with DSC capability;
- (d) A MF/HF DSC watchkeeping receiver capable of maintaining a continuous DSC watch on 2187.5 kHz, 8414.5 and at least one of the distress and safety frequencies 4207.5, 6312, 12577 or 16804.5 kHz, and allowing, at any time, the selection if any of any of these distress and safety frequencies. This equipment may be combined with or separate from the above MF/HF radio installation;
- (e) An INMARSAT ship earth station capable of receiving Maritime Safety Information (MSI) using enhanced group calling;
- (f) A 406 MHz or 1.6 GHz EPIRB;
- (g) Hand held VHF radiotelephone apparatus fitted with VHF channel 6, 13, 16 and 67;<sup>†</sup> and
- (h) 9 GHz radar transponder(s), unless the Chief Marine Surveyor determines that the nature of the ship's operations makes this requirement unnecessary.<sup>†</sup>

**B. On international voyages**

Non-SOLAS vessels shall be required to be fitted, in addition to equipment listed at item A above, with NAVTEX receiver when operating in NAVTEX areas.

**C. On voyages in sea areas A3 and A4**

- (a) A VHF radio installation with DSC capability;\*
- (b) A DSC Watchkeeping receiver for VHF channel 70 which may be separate or combined with the VHF radio installation above;
- (c) A MF/HF radio installation with DSC capability;
- (d) A MF/HF DSC watchkeeping receiver capable of maintaining a continuous DSC watch on 2187.5 kHz, 8414.5 and at least one of the distress and safety frequencies 4207.5, 6312, 12577 or 16804.5 kHz, and allowing, at any time, the selection if any of any of these distress and safety frequencies. This equipment may be combined with or separate to the above MF/HF radio installation;
- (e) An INMARSAT ship earth station capable of receiving Maritime Safety Information (MSI) using enhanced group calling;
- (f) A 406 MHz EPIRB;
- (g) HF narrow band direct printing equipment;

- (h) Hand held VHF radiotelephone apparatus fitted with VHF channel 6, 13, 16 and 67;<sup>†</sup> and
- (i) 9 GHz radar transponder(s), unless the Chief Marine Surveyor determines that the nature of the ship's operations makes this requirement unnecessary.<sup>†</sup>

\* All GMDSS ships while at sea, shall continue to maintain, when practicable, continuous listening watch on VHF channel 16. Existing ships fitted with, VHF equipment without DSC capability may apply to the Chief Marine Surveyor for exemption from fitting a VHF radio with DSC capability.

† The number of radar transponders and hand held VHF radiotelephone units to be carried by each vessel will be determined by the Chief Marine Surveyor on a case-by-case basis. The Chief Marine Surveyor will take into account radar transponders and hand held VHF radiotelephone units carried on the ship in accordance with Marine Orders, Part 25.

\* \* \* \* \*

**Appendix 8**  
**Radio Log-book**  
**Part I**

<i>Name of ship</i>	<i>Official number and international call sign</i>	<i>Home Port</i>	<i>Gross tonnage</i>

<i>Ports at which, and date when, voyage commenced</i>	<i>Nature of the voyage or employment</i>	<i>Ports at which, and date when, voyage terminated</i>
Port		Port
Date		Date

Delivered/posted to the Senior Radio Surveyor, Canberra

on the ..... day of ..... 20...., together with Radio Log Book Part II

serial numbers ..... to .....

Master .....

Address .....

.....

**SECTION A — PARTICULARS OF RADIO STAFF**

<i>Name</i>	<i>Home address</i>	<i>Certificate number and class</i>

**SECTION B — PARTICULARS OF BATTERIES ON BOARD**

<i>Battery number</i>	<i>Number of cells</i>	<i>Manufacturer</i>	<i>Type of battery</i>	<i>Date supplied</i>	<i>Voltage &amp; ampere hour capacity</i>	<i>Purpose for which used</i>

**SECTION C—MONTHLY REPORT OF BATTERIES (LEAD-ACID TYPES ONLY)**

<i>Date</i>	<i>Battery Number and cell number</i>	<i>Specific gravity as measured</i>		<i>Remarks</i>	<i>Date</i>	<i>Battery Number and cell number</i>	<i>Specific gravity as measured</i>		<i>Remarks</i>
		<i>Before charge</i>	<i>After charge</i>				<i>Before charge</i>	<i>After charge</i>	

**Part II**

<i>Name of ship</i>	<i>Official number and international call sign</i>	<i>Home Port</i>	<i>Gross tonnage</i>

Serial number ..... from ..... to .....

<i>Date and time in Coordinated Universal Time</i>	<i>Station from</i>	<i>Station to</i>	<i>Full details of calls, signals and distress traffic</i>	<i>Frequency</i>

\* \* \* \* \*