



भारत सरकार / GOVERNMENT OF INDIA
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
MINISTRY OF PORTS, SHIPPING AND WATERWAYS

नौवहन महानिदेशालय, मुंबई
DIRECTORATE GENERAL OF SHIPPING, MUMBAI



F. No.: 25-25011/18/2022-NT-DGS

Dated: 07.11.2022

MSN No. 11 of 2022

Subject: Guidelines for Shore-Based Maintenance and Annual Testing of Emergency Position Indicating Radio Beacons (EPIRBs)- reg.

1. The Maritime Safety Committee, at its 104th session held from 4 to 8 October 2021, has approved the revised Guidelines for Shore-Based Maintenance and Annual Testing of emergency position indicating radio beacons (EPIRBs) vide its circulars MSC.1/Circ.1039/Rev.1 and MSC.1/Circ.1040/Rec.2 dated 18 October 2021 respectively. (Copy attached as Annexure-I & II). The purpose of these Guidelines is to establish standardized procedures and minimum levels of service for the testing and maintenance of EPIRBs to ensure maximum reliability while minimizing the risk of false distress alerting.
2. Recalling the regulations IV/ 7.1 and 14.1 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, concerning radiocommunications for the GMDSS, which require that ships be provided with an EPIRB shall be type approved by the Administration and shall conform to appropriate performance standards not inferior to those adopted by the IMO.
3. Recognizing this requirement, the Maritime Safety Committee (MSC), vide Resolution MSC.471(101), has adopted the recommendation of NCSR (Navigation, Communications and Search and Rescue) Sub-Committee on performance standards for float-free EPIRBs operating on 406 MHz and also recommends Member States to ensure that float-free EPIRBs operating on the frequency 406 MHz, which form part of the GMDSS shall;
 - a) if installed before 1st July 2022, conform to performance standards and type-approval standards not inferior to those specified in the annex to Resolution A.810(19) as amended; (Copy attached as Annexure-III).
 - b) if installed on or after 1st July 2022, conform to performance standards and type-approval standards not inferior to those specified in the annex to Resolution MSC.471(101) (Copy is attached as Annexure-IV.)


07/11/2022


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4. Based on these recommendations of the Maritime Safety Committee, approved EPIRB service stations in India are required to comply with the revised guidelines and issue Shore-based Maintenance Certificates and Annual Testing Certificates in line with revised MSC Circular nos. MSC.1/Circ.1039/Rev.1 and MSC.1/Circ.1040/Rec.2 dated 18 October 2021 respectively.
5. Recognizing the need to implement in the shipping fraternity, the Directorate General of Shipping bring these Guidelines for the attention of shore-based maintenance providers, equipment manufacturers, classification societies, shipping companies, ship owners, ship operators, shipmasters and all other parties concerned for proper testing and maintenance of EPIRBs used in GMDSS.
6. This Merchant Shipping Notice supersedes all previous executive orders on the above subject matter.
7. This is issued with the approval of Director General of Shipping and Additional Secretary to the Govt. of India.



07/11/2022

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MSC.1/Circ.1039/Rev.1
18 October 2021

**GUIDELINES FOR SHORE-BASED MAINTENANCE OF EMERGENCY
POSITION-INDICATING RADIO BEACONS (EPIRBs)**

1 The Maritime Safety Committee, at its 104th session (4 to 8 October 2021), approved the revised *Guidelines for shore-based maintenance of emergency position-indicating radio beacons (EPIRBs)*, prepared by the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its eighth session (19 to 23 April 2021), as set out in the annex.

2 EPIRBs in compliance with resolution MSC.471(101) should comply with the Guidelines set out in the annex to this circular. However, EPIRBs in compliance with resolution A.810(19), as amended by resolutions MSC.56(66) and MSC.120(74), should comply with MSC/Circ.1039.

3 Member States are invited to bring the annexed Guidelines to the attention of shore-based maintenance providers, equipment manufacturers, classification societies, shipping companies, shipowners, ship operators, shipmasters and all other parties concerned.



ANNEX

GUIDELINES FOR SHORE-BASED MAINTENANCE OF EMERGENCY POSITION-INDICATING RADIO BEACONS (EPIRBs)

1 Introduction

1.1 The purpose of these Guidelines is to establish standardized procedures and minimum levels of service for the testing and maintenance of emergency position-indicating radio beacons (EPIRBs) to ensure maximum reliability while minimizing the risk of false distress alerting.

1.2 The Guidelines are applicable to EPIRBs approved to comply with the requirements of SOLAS regulation IV/7.1. These EPIRBs include 121.5 MHz transmitters, Global Navigation Satellite System (GNSS) receivers, and automatic identification system (AIS) locating signals.

1.3 The Guidelines also apply to service exchange EPIRBs which should be properly encoded to match the appropriate registration database.

2 Shore-based maintenance provider

2.1 The shore-based maintenance (SBM) provider should:

- .1 have a quality control system audited by a competent authority in respect of its servicing operation;
- .2 have access to adequate calibrated test equipment and facilities to carry out the SBM in accordance with these Guidelines;
- .3 have access to batteries and other spare parts to the original equipment specification;
- .4 have access to up-to-date technical manuals, service bulletins and the latest software versions as provided by the original equipment manufacturer;
- .5 keep records of maintenance, available for inspection by the Administration as may be required;
- .6 ensure that all personnel responsible for supervising and for carrying out the maintenance procedures are adequately trained by the manufacturer or its authorized agent, and fully competent to perform their duties; and
- .7 issue a shore-based maintenance report with a list of the test results and maintenance performed.

3 Prevention of false distress alerts

3.1 Throughout the testing and maintenance process, great care must be taken to avoid the transmission of false distress alerts. The transmissions may be detected by aircraft and other vessels as well as satellites.

3.2 A radio-frequency-screened room or enclosure should be used for all maintenance procedures involving, or likely to involve, any transmission from an EPIRB.

3.3 Provision of a 121.5 MHz monitor receiver and AIS receiver is required; this will allow for the receipt of the homing and/or AIS transmitter signal and give a warning if the EPIRB is accidentally activated outside the screened enclosure.

3.4 If a distress signal is transmitted accidentally, the transmission should immediately be stopped, and the local rescue coordination centre (RCC)* should be contacted immediately and informed. The nearest Cospas-Sarsat mission control centre (MCC) should also be informed (see also *Guidelines for the avoidance of false distress alerts* (resolution A.814(19), as may be updated).

4 Maintenance service interval

4.1 EPIRBs should be inspected and tested in accordance with MSC.1/Circ.1040/Rev.2.

4.2 Shore-based maintenance of all EPIRBs, as defined in paragraph 1.2, should be carried out in accordance with these Guidelines at intervals specified by the flag State Administration and not exceeding five years. It is recommended that the battery be replaced at the time when the maintenance is performed. If the battery is being replaced, or other servicing performed, the recommended shore-based maintenance should be performed concurrently.

5 Self-test

5.1 Prior to carrying out any maintenance and, upon completion, a self-test should be performed, following the instructions on the equipment, and the results noted. If the beacon is fitted with GNSS self-test capability, then a GNSS self-test should be performed.

5.2 Attention is drawn to section 3 on the prevention of false distress alerts. Avoidance of live transmissions is required to prevent unnecessary loading of the satellite channels and the relay of false distress alerts to local RCCs.

5.3 It should be verified that the self-test mode operates properly. This check could be performed by holding the switch in self-test mode position for at least one minute and then releasing it. The number of self-test bursts should be verified to be no more than one.

6 Battery change

6.1 The main battery should be changed in accordance with the manufacturer's recommendations, including the replacement of any other routine service parts (e.g. seals, memory battery, desiccant).

6.2 The removed batteries should be disposed of in accordance with the manufacturer's and/or national/local recommendations.

6.3 After having changed the battery, the new battery expiry date label, as supplied by the beacon manufacturer with the replacement battery, should be fixed on the exterior surface of the EPIRB.

* Contact information is available at: <https://cospas-sarsat.int/en/contacts-pro/contacts-details-all>

7 Satellite distress transmission

7.1 The EPIRB should be activated in its normal transmitting mode (i.e. not just self-test). Attention is drawn to section 3 on the prevention of false distress alerts. Where seawater contacts are fitted, these should be connected together, as indicated in the manufacturer maintenance instructions or servicing guidelines, to test activation of the EPIRB.

7.2 The transmitted signal should be checked with a suitable test receiver to verify the signal integrity and coding.

7.3 The frequency of the transmitted signal should be recorded and verified to be within the limits required by the specification to which it is approved.

7.4 The output power of the transmitter should be checked in the self-test mode. A simple method of the emission verification, such as a low sensitivity receiver placed at an unobstructed distance of at least 3 m from the EPIRB antenna, may be used for this check. The original equipment manufacturer may suggest an appropriate method to verify the output power.

8 121.5 MHz homing transmission

8.1 The EPIRB should be activated in its normal transmitting mode (i.e. not just self-test). Attention is drawn to section 3 on the prevention of false distress alerts. Where seawater contacts are fitted, these should be connected together, as indicated in the manufacturer maintenance instructions or servicing guidelines, to test activation of the EPIRB.

8.2 The transmitted signal should be checked with a suitable test receiver for the characteristic swept tone modulation.

9 AIS locating signal transmission

9.1 The EPIRB should be activated in its normal transmitting mode (i.e. not just self-test). Attention is drawn to section 3 on the prevention of false distress alerts. Where seawater contacts are fitted, these should be connected together, as indicated in the manufacturer maintenance instructions or servicing guidelines, to test activation of the EPIRB.

9.2 With the GNSS signal applied as described below, the transmitted signal should be checked with a suitable AIS receiver or test receiver for the proper AIS message transmission and to verify that the AIS message content is valid (contains the correct AIS identity (User ID), the correct position and the correct EPIRB 15 Hex ID). Note that for second-generation EPIRBs, the 15 Hex ID is formed by truncating the 23 Hex ID, as indicated in the manufacturer's maintenance instructions or servicing guidelines.

10 Global Navigation Satellite System (GNSS)

10.1 EPIRBs are designed to transmit a position derived from a GNSS receiver.

10.2 The original EPIRB equipment manufacturer should be consulted for a method of testing the correct operation of this function, e.g. by using a GNSS repeater/simulator or external input. This test may involve a live transmission from the EPIRB and should be performed in a screened room or enclosure in accordance with paragraph 3.2. Attention is drawn to section 3 on the prevention of false distress alerts.

10.3 A test receiver should be used to verify that the satellite signal transmitted by the EPIRB contains the correctly encoded position data derived from the GNSS receiver.

10.4 If the EPIRB is a Return Link Service (RLS) capable beacon and is programmed with the RLS message protocol, testing to ensure proper operation should be done as indicated in the manufacturer's maintenance instructions or servicing guidelines (and, if applicable, the RLS service provider's guidelines).

11 Waterproof integrity

11.1 The EPIRB should be inspected for any signs of damage or cracks to the casing, or of water ingress. Any damaged item should be replaced, as indicated in the manufacturer's maintenance instructions or servicing guidelines.

11.2 The EPIRB should be tested for waterproof integrity at the end of the SBM and prior to a final self-test to verify proper operation, as indicated in the manufacturer's maintenance instructions or servicing guidelines. The equipment manufacturer may suggest an appropriate method to test the integrity of the EPIRB.

11.3 One method involves immersing the equipment in hot water (20-30°C above ambient) for a period of at least one minute. It can be readily seen if there are any problems with the seals, as the air inside the beacon expands and escapes as a stream of bubbles. This test should not be carried out with cool water, as the water may be drawn into the equipment without showing significant release of air bubbles.

11.4 EPIRBs equipped with seawater switches should have this function disabled during the immersion test to prevent activation, unless the complete test is performed inside a screened room. This disabling may be achieved by immersing the EPIRB complete with a mounting bracket if the bracket includes an interlock to prevent activation before release. The manufacturer should be consulted for specific guidance.

12 Labelling

12.1 As a minimum, the equipment external labelling should be checked for the following details:

- .1 manufacturer's serial number; this identifies the equipment, even if the programmed data (e.g. MMSI or call sign) is later changed;
- .2 the transmitted identification code:
 - .1 for first-generation EPIRBs compliant with document C/S T.001, this will be the beacon 15 Hexadecimal Identification (15 Hex ID) and other encoded identification information (MMSI/call sign) as required by the Administration. It should be verified that the label matches the information decoded from the self-test mode transmission using the test receiver. For the Cospas-Sarsat location protocol beacons, the 15 Hex ID should correspond to position data set to default values;

- .2 for second-generation EPIRBs compliant with document C/S T.018, this will be the beacon 23 Hexadecimal Identification (23 Hex ID) and other encoded identification information (MMSI/call sign) as required by the Administration. It should be verified that the label matches the information decoded from the self-test mode transmission using the test receiver. For the Cospas-Sarsat location protocol beacons, the 23 Hex ID should correspond to position data set to default values; and
 - .3 the EPIRB AIS identity (User ID), which will be in the format 974XXYYYY. It should be verified that the label matches the information decoded from the AIS self-test mode transmission using a suitable AIS receiver or test receiver;
 - .3 the expiry date of the battery; and
 - .4 the date when the next shore-based maintenance is due (see paragraph 13.1).
- 12.2 The above checks also apply if a replacement EPIRB is provided by the SBM provider.

13 Shore-based maintenance report and other documentation

13.1 The results of shore-based maintenance should be provided in the form of a shore-based maintenance report, a copy of which is to be kept on board, and a label affixed to the exterior of the beacon detailing the name of the SBM provider and the date when the next shore-based maintenance is due.

13.2 The SBM provider may affix a tamper-proof seal or similar device on completion of the SBM.

13.3 Before returning the beacon to the owner, or when providing a replacement beacon, the SBM provider should check the registration details with the beacon registry, where practicable.



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MSC.1/Circ.1040/Rev.2
18 October 2021

GUIDELINES ON ANNUAL TESTING OF EMERGENCY POSITION-INDICATING RADIO BEACONS (EPIRBs)

1 The Maritime Safety Committee, at its 104th session (4 to 8 October 2021), approved the revised *Guidelines on annual testing of emergency position-indicating radio beacons (EPIRBs)*, prepared by the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its eighth session (19 to 23 April 2021), as set out in the annex.

2 Member States are invited to bring these Guidelines to the attention of shipping companies, shipowners, ship operators, radio surveyors, equipment manufacturers, classification societies, shipmasters and all other parties concerned.

3 This circular supersedes MSC.1/Circ.1040/Rev.1.

ANNEX**GUIDELINES ON ANNUAL TESTING OF EMERGENCY
POSITION-INDICATING RADIO BEACONS (EPIRBs)**

1 These Guidelines are applicable to the annual testing of emergency position-indicating radio beacons (EPIRBs) that are approved to comply with the provisions of SOLAS regulation IV/15.9.

2 The testing should be carried out by appropriately trained and approved personnel using suitable test equipment capable of performing all the relevant measurements required in these Guidelines (this testing normally will be done by a radio surveyor as part of the annual radio survey). All tests of electrical parameters should be performed in the self-test mode, if possible.

3 If a distress signal is transmitted accidentally, the transmission should immediately be stopped, and the local rescue coordination centre (RCC)¹ should be contacted immediately and informed. The nearest Cospas-Sarsat mission control centre (MCC) should also be informed (see also *Guidelines for the avoidance of false distress alerts* (resolution A.814(19), as may be updated)).

4 The examination of the installed EPIRB should include:

- .1 checking position and mounting of the bracket to ensure unimpeded float-free operation;
- .2 carrying out visual inspection of the EPIRB and the bracket for defects, any signs of damage, degradation or cracks to the casing, or of water ingress;
- .3 carrying out the beacon self-test routine, including the GNSS self-test, if applicable;
- .4 checking that the EPIRB identification (15 Hex ID for first-generation beacons and 23 Hex ID for second-generation beacons and other required information, including, if applicable, the AIS identity (User ID)) is clearly marked on the outside of the equipment;
- .5 decoding the EPIRB hexadecimal identification digits (15 Hex ID for first-generation beacons and 23 Hex ID for second-generation beacons) and other information from the transmitted signal, including, if applicable, the AIS identity (User ID), checking that the decoded information (Hex ID or MMSI/call sign data, as required by the Administration) is identical to the identification marked on the beacon;
- .6 verifying that the MMSI number or radio call sign, if encoded in the beacon, corresponds with that assigned to the ship;²

¹ Contact information is available at: <https://cospas-sarsat.int/en/contacts-pro/contacts-details-all>

² See the ship's radio licence, the national database or the ITU Maritime Mobile Access and Retrieval System (MARS) (<https://www.itu.int/en/ITU-R/terrestrial/mars/Pages/default.aspx>), as appropriate.

- .7 verifying registration in an appropriate beacon registration database³ through documentation or through the point of contact associated with that country code;
- .8 checking the battery expiry date;
- .9 checking the hydrostatic release and its expiry date, as appropriate;
- .10 verifying the emission in the 406 MHz band using the self-test mode or an appropriate device to avoid transmission of a distress call to the satellites;
- .11 if possible, verifying emission on the 121.5 MHz frequency using the self-test mode or an appropriate device to avoid activating the SAR system;
- .12 verifying emission on the appropriate AIS frequencies, if applicable, using the self-test mode or an appropriate device to avoid creating false alerts;
- .13 verifying that the EPIRB has been maintained by an approved shore-based maintenance provider at intervals required by the Administration, in accordance with the most recent revision of MSC/Circ.1039;
- .14 after the test, remounting the EPIRB in its bracket, checking that no transmission has been started;
- .15 verifying the presence of a firmly attached lanyard in good condition; the lanyard should be neatly stowed, and should not be tied to the vessel or the mounting bracket;
- .16 checking the presence of beacon operating instructions manual; and
- .17 checking the presence of pictorial instructions for manual operation visible at the location of the beacon.

³ A national database or the International Beacon Registration Database (<https://www.406registration.com>), as appropriate.



ASSEMBLY
19th session
Agenda item 10

NOT TO BE REMOVED
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THE IMO LIBRARY

RESOLUTION A.810(19)
adopted on 23 November 1995

**PERFORMANCE STANDARDS FOR FLOAT-FREE SATELLITE EMERGENCY
POSITION-INDICATING RADIO BEACONS (EPIRBs)
OPERATING ON 406 MHz**

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECALLING ALSO regulations IV/7.1.6 and 14.1 of the 1988 amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974, concerning radiocommunications for the Global Maritime Distress and Safety System (GMDSS), which require, respectively, that ships be provided with a satellite emergency position-indicating radio beacon (EPIRB) and that such EPIRBs shall conform to appropriate performance standards not inferior to those adopted by the Organization,

RECOGNIZING the need to prepare performance standards for float-free satellite EPIRBs operating through a polar-orbiting satellite system on 406 MHz to be used in the GMDSS in order to ensure the operational reliability of such equipment and to avoid, as far as practicable, adverse interaction between such equipment and other communication and navigation equipment on board ship,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its sixty-fifth session,

1. ADOPTS the Recommendation on Performance Standards for Float-Free Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating on 406 MHz set out in the Annex to the present resolution;
2. RECOMMENDS Governments to ensure that float-free satellite EPIRBs operating on the frequency 406 MHz, which form part of the GMDSS:
 - (a) if installed on or after 23 November 1996, conform to performance standards not inferior to those specified in the Annex to the present resolution;
 - (b) if installed before 23 November 1996, conform to performance standards not inferior to those specified in the Annex to resolution A.763(18);
 - (c) if installed before 4 November 1994, conform to performance standards not inferior to those specified in the Annex to resolution A.763(18), except that they need not be provided with the 121.5 MHz homing beacon required by 2.3.14 of part A thereof;

3. INVITES the COSPAS-SARSAT partners to ensure that any amendments to the specification for COSPAS-SARSAT 406 MHz distress beacons are agreed with the Organization prior to their adoption;
4. REQUESTS the Maritime Safety Committee to ensure that any proposed amendments to this resolution are agreed with the COSPAS-SARSAT partners prior to their adoption;
5. REQUESTS ALSO the Maritime Safety Committee to review the code assignment method recommended in 4 of part B of the Annex to this resolution prior to 1 February 1997;
6. REQUESTS FURTHER the Maritime Safety Committee to keep these Performance Standards under review and to adopt amendments thereto, as necessary.

ANNEX

**RECOMMENDATION ON PERFORMANCE STANDARDS FOR FLOAT-FREE
SATELLITE EMERGENCY POSITION-INDICATING RADIO
BEACONS (EPIRBs) OPERATING ON 406 MHz**

Part A - GENERAL

1 INTRODUCTION

The satellite emergency position-indicating radio beacon (EPIRB) should, in addition to meeting the requirements of the Radio Regulations, the relevant ITU-R Recommendations and the general requirements set out in resolution A.694(17), comply with the following performance standards.

2 GENERAL

2.1 The satellite EPIRB should be capable of transmitting a distress alert to a polar orbiting satellite.

2.2 The EPIRB should be of an automatic float-free type. The equipment, mounting and releasing arrangements should be reliable, and should operate satisfactorily under the most extreme conditions likely to be met with at sea.

2.3 The satellite EPIRB should:

- .1 be fitted with adequate means to prevent inadvertent activation;
- .2 be so designed that the electrical portions are watertight at a depth of 10 m for at least 5 min. Consideration should be given to a temperature variation of 45°C during transitions from the mounted position to immersion. The harmful effects of a marine environment, condensation and water leakage should not affect the performance of the beacon;
- .3 be automatically activated after floating free;
- .4 be capable of manual activation and manual deactivation;
- .5 be provided with means to indicate that signals are being emitted;
- .6 be capable of floating upright in calm water and have positive stability and sufficient buoyancy in all sea conditions;
- .7 be capable of being dropped into the water without damage from a height of 20 m;
- .8 be capable of being tested, without using the satellite system, to determine that the EPIRB is capable of operating properly;
- .9 be of highly visible yellow/orange colour and be fitted with retroreflecting material;
- .10 be equipped with a buoyant lanyard suitable for use as a tether, which should be so arranged as to prevent its being trapped in the ship's structure when floating free;

- .11 be provided with a low duty cycle light (0.75 cd), active during darkness, to indicate its position to nearby survivors and to rescue units;
- .12 not be unduly affected by seawater or oil or both;
- .13 be resistant to deterioration in prolonged exposure to sunlight; and
- .14 be provided with a 121.5 MHz beacon primarily for homing by aircraft.

2.4 The battery should have sufficient capacity to operate the satellite EPIRB for a period of at least 48 h.

2.5 The satellite EPIRB should be so designed as to operate under any of the following environmental conditions:

- .1 ambient temperatures of -20°C to $+55^{\circ}\text{C}$;
- .2 icing;
- .3 relative wind speeds up to 100 knots; and
- .4 after stowage, at temperatures between -30°C and $+70^{\circ}\text{C}$.

2.6 The installed satellite EPIRB should:

- .1 have local manual activation; remote activation may also be provided from the navigating bridge, while the device is installed in the float-free mounting;
- .2 be capable, while mounted on board, of operating properly over the ranges of shock and vibration and other environmental conditions normally encountered above deck on seagoing ships; and
- .3 be designed to release itself and float free before reaching a depth of 4 m at a list or trim of any angle.

3 DISTRESS FUNCTION

3.1 When the satellite EPIRB is manually operated a distress alert should be initiated only by means of a dedicated distress alert activator.

3.2 The dedicated activator should:

- .1 be clearly identified; and
- .2 be protected against inadvertent operation.

3.3 Manual distress alert initiation should require at least two independent actions.

3.4 The satellite EPIRB should not be automatically activated after being manually removed from the release mechanism.

4 LABELLING

In addition to the items specified in resolution A.694(17) on general requirements, the following should be clearly indicated on the exterior of the equipment:

- .1 brief operating instructions;
- .2 expiry date for the primary battery used; and
- .3 the identity code programmed into the transmitter.

Part B - SATELLITE SIGNALS

1 The satellite EPIRB distress alerting signal should be transmitted on the frequency of 406.025 MHz using G1B class of emission.

2 The technical characteristics of the transmitted signal and the message format should be in accordance with Recommendation ITU-R M.633.

3 Provisions should be included for storing the fixed portion of the distress message in the satellite EPIRB using non-volatile memory.

4 A unique beacon identification code should be made part of all messages.

Until 1 February 1999, this identification code should include a 3-digit code for the country in which the beacon is registered, followed by either:

- .1 the trailing 6 digits of the ship station identity in accordance with Appendix 43 of ITU Radio Regulations; or
- .2 a unique serial number; or
- .3 a radio call sign.

Preference is given to method .1.

After 1 February 1999, all new beacon installations should be in accordance with method .1¹.

5 The 121.5 MHz homing signal should:

- .1 have a continuous duty cycle, except that it may be interrupted for up to a maximum of 2 s during the transmission of the 406 MHz signal; and
- .2 with the exception of the sweep direction, meet the technical characteristics of Appendix 37A of the Radio Regulations. The sweep may be either upward or downward.

¹The code assignment method is to be reviewed prior to 1 February 1997.

RESOLUTION MSC.471(101)
(adopted on 14 June 2019)

**PERFORMANCE STANDARDS FOR FLOAT-FREE EMERGENCY
POSITION-INDICATING RADIO BEACONS (EPIRBs)
OPERATING ON 406 MHz**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO regulations IV/7.1 and 14.1 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, concerning radiocommunications for the Global Maritime Distress and Safety System (GMDSS), which require, inter alia, that ships be provided with an emergency position-indicating radio beacon (EPIRB), which shall conform to appropriate performance standards not inferior to those adopted by the Organization,

RECOGNIZING the need to prepare performance standards for float-free EPIRBs operating on 406 MHz through the Cospas-Sarsat System of low-altitude earth orbiting, medium-altitude earth orbiting, and geostationary earth orbiting satellites to be used in the GMDSS, in order to ensure the operational reliability of such equipment and to avoid, as far as practicable, adverse interaction between such equipment and other communication and navigation equipment on board ships,

RECOGNIZING ALSO that EPIRBs, as a component of the GMDSS and operating through the Cospas-Sarsat System in the frequency band 406-406.1 MHz, should be type-approved to ensure the integrity of the Cospas-Sarsat satellite system, avoid harmful interference to the spaceborne equipment, exclude unauthorized transmissions, and to provide reliable data to rescue coordination centres,

HAVING CONSIDERED the recommendation made by Sub-Committee on Navigation, Communications and Search and Rescue, at its sixth session,

1 ADOPTS the *Recommendation on performance standards for float-free Emergency Position-Indicating Radio Beacons (EPIRBs) operating on 406 MHz*, set out in the annex to the present resolution;

2 RECOMMENDS that Member States ensure that float-free EPIRBs operating on the frequency 406 MHz, which form part of the GMDSS:

- .1 if installed on or after 1 July 2022, conform to performance standards and type-approval standards not inferior to those specified in the annex to the present resolution;
- .2 if installed before 1 July 2022, conform to performance standards not inferior to those specified in the annex to resolution A.810(19), as amended by resolutions MSC.56(66) and MSC.120(74), and type-approval standards not inferior to those specified in resolution A.696(17);

3 INVITES the Cospas-Sarsat partners to ensure that any amendments to the specification for Cospas-Sarsat 406 MHz distress beacons that could impact on this performance standard are agreed with the Organization prior to their adoption;

4 AGREES that any proposed amendments to this resolution are agreed with the Cospas-Sarsat partners prior to their adoption;

5 ALSO AGREES to keep these Performance Standards under review and to adopt amendments thereto, as necessary.

ANNEX

**RECOMMENDATION ON PERFORMANCE STANDARDS FOR
FLOAT-FREE-EMERGENCY POSITION-INDICATING RADIO
BEACONS (EPIRBs) OPERATING ON 406 MHz****Part A – GENERAL****1 INTRODUCTION**

The emergency position-indicating radio beacon (EPIRB) should, in addition to meeting the requirements of the Radio Regulations, the relevant ITU-R Recommendations and the general requirements set out in resolution A.694(17), comply with the following performance standards.

2 GENERAL

2.1 The EPIRB should be capable of transmitting a distress alert, including encoded position information from a receiver using a recognised global navigation satellite system (GNSS) with global coverage, to satellites equipped with a search and rescue 406 MHz processor or repeater.

2.2 The EPIRB should be of an automatic float-free type. The equipment, mounting and releasing arrangements should be reliable, and should operate satisfactorily under the most extreme conditions likely to be met with at sea.

2.3 The EPIRB should:

- .1 be fitted with adequate means to prevent inadvertent activation;
- .2 be so designed that the electrical portions are watertight at a depth of 10 m for at least 5 min. Consideration should be given to a temperature variation of 45°C during transitions from the mounted position to immersion. The harmful effects of a marine environment, condensation and water leakage should not affect the performance of the beacon;
- .3 be automatically activated after floating free;
- .4 be capable of manual activation and deactivation;
- .5 be provided with means to indicate that signals are being emitted;
- .6 be capable of floating upright in calm water and have positive stability and sufficient buoyancy in all sea conditions;
- .7 be capable of being dropped into the water without damage from a height of 20 m;
- .8 be capable of being tested, without using the satellite system, to determine that the EPIRB is capable of operating properly;
- .9 be of highly visible yellow/orange colour and be fitted with retroreflecting material;

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- .10 be equipped with a buoyant lanyard suitable for use as a tether (to a liferaft, lifeboat or person in the water but not to the ship), which should be so arranged as to prevent its being trapped in the ship's structure when floating free;
 - .11 be provided with a low duty cycle light (0.75 cd), active during darkness, visible to the human eye and detectable by all types of night vision devices, to indicate its position to nearby survivors and to rescue units;
 - .12 not be unduly affected by seawater or oil or both;
 - .13 be resistant to deterioration in prolonged exposure to sunlight;
 - .14 be provided with a 121.5 MHz beacon primarily for homing by aircraft;
 - .15 be provided with a GNSS receiver for position fixes and an associated indication that GNSS signal reception is satisfactory or unsatisfactory; and
 - .16 be provided with an Automatic Identification System (AIS) locating signal in accordance with the Recommendation ITU-R M.1371, Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band.

2.4 The battery should have sufficient capacity to operate the EPIRB for a period of at least 48 h.

2.5 The EPIRB should be so designed as to operate under any of the following environmental conditions:

- .1 ambient temperatures of -20°C to +55°C;
- .2 icing;
- .3 relative wind speeds up to 100 knots; and
- .4 after stowage, at temperatures between -30°C and +70°C.

2.6 The installed EPIRB should:

- .1 have local manual activation; remote activation may also be provided from the navigating bridge, while the device is installed in the float-free mounting;
- .2 be capable, while mounted on board, of operating properly over the ranges of shock and vibration and other environmental conditions normally encountered above deck on seagoing ships; and
- .3 be designed to release itself and float free before reaching a depth of 4 m at a list or trim of any angle.

3 DISTRESS FUNCTION

3.1 When the EPIRB is manually operated a distress alert should be initiated only by means of a dedicated distress alert activator.

3.2 The dedicated activator should:

- .1 be clearly identified; and
- .2 be protected against inadvertent operation.

3.3 Manual distress alert initiation should require at least two independent actions.

3.4 The EPIRB should not be automatically activated after being manually removed from the release mechanism.

4 GNSS RECEIVER POSITION REPORTING

When the EPIRB is activated:

- .1 the GNSS position fix shall be updated at intervals of no more than five minutes; and
- .2 when an updated fix is transmitted in the AIS message for the first time, the error between the transmitted and the actual position shall not exceed 30 m assuming a drift rate of 3 kn.

5 LABELLING

5.1 Labelling for operation controls and indicators should, as far as possible, be understood through graphical images and symbols without the need for text.

5.2 In addition to the items specified in resolution A.694(17) on general requirements, the following should be clearly indicated on the exterior of the equipment:

- .1 brief operating instructions;
- .2 expiry date for the primary battery used; and
- .3 the identity codes programmed into the transmitters.

Part B – RADIO-FREQUENCY SIGNALS

1 The technical characteristics of the transmitted signal and the message format should be in accordance with the requirements of Cospas-Sarsat System documents C/S T.001 or C/S T.018.

2 Provisions should be included for storing the fixed portion of the distress message in the EPIRB using non-volatile memory.

3 A unique beacon identification code should be made part of all 406 MHz messages. For EPIRBs compliant with C/S T.001 this identification code should include a three-digit maritime identification digits (MID) code to denote the country in which the beacon is registered, followed by either:

- .1 the trailing 6 digits of the ship station identity in accordance with appendix 43 of ITU Radio Regulations Recommendation ITU-R M.585, Assignment and use of identities in the maritime mobile service; or

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- .2 a unique serial number; or
 - .3 a radio call sign.

Preference is given to the method in sub-paragraph .1 above.

For EPIRBs compliant with C/S T.018 this identification code should include a three-digit maritime identification digits (MID) code to denote the country in which the beacon is registered, followed by a unique serial number and either the maritime mobile service identity or a radio call sign.

4 The 121.5 MHz homing signal should:

- .1 have a 121.5 MHz transmitting duty cycle not less than 50% (1.125 seconds on, 1.125 seconds off) and if more than 50%, the on time should be increased beyond 1.125 seconds and the off time reduced accordingly; and
- .2 with the exception of the sweep direction, meet the technical characteristics of appendix 15 of the Radio Regulations. The sweep may be either upward or downward.

5 The AIS locating signal should:

- .1 transmit in accordance with recommendation ITU-R Rec M.1371;
- .2 start after the first 406 MHz satellite message and ensure the AIS signal does not conflict with a scheduled 406 MHz satellite signal;
- .3 when the AIS signal coincides with a scheduled 121.5 MHz homing signal, then the 121.5 MHz homing signal may be interrupted for the transmission of the AIS signal, provided the minimum 50% duty cycle is maintained;
- .4 broadcast the Cospas-Sarsat beacon 15 HEX-ID in the AIS message 14, alternating with the text "EPIRB ACTIVE" on AIS1 and AIS2; and
- .5 indicate in the transmitted AIS locating signal when the included position fix is more than five minutes old.

Part C –TYPE APPROVAL OF EPIRBs OPERATING IN THE Cospas-Sarsat SYSTEM

1 EPIRBs forming an integral component of the GMDSS and operating through the Cospas-Sarsat satellite system in the frequency band 406 - 406.1 MHz should be type approved to ensure the integrity of the Cospas-Sarsat satellite system, avoid harmful interference to the spaceborne equipment, exclude unauthorized transmissions, and to provide reliable data to rescue coordination centres.

2 National administrations should:

- .1 ensure, as part of national type approval procedures, that any new type of EPIRB to be deployed on board ships is tested to confirm that it is in accordance with the performance standards for EPIRBs; confirmation that the EPIRB meets part B of this performance standard can be achieved by either:

- .1 performing, or having performed, under national procedures, all appropriate tests; and/or
 - .2 accepting type approval test results obtained through the Cospas-Sarsat type approval procedure for first generation beacons (Cospas-Sarsat document C/S T.007) or the Cospas-Sarsat type approval procedure for second generation beacons (Cospas-Sarsat document C/S T.021) and confirmed by the delivery of a Cospas-Sarsat Type Approval Certificate; and
- .2 encourage national type approval authorities to develop test procedures compatible, to the extent possible, with Cospas-Sarsat System document C/S T.007 or C/S T.021 as appropriate and, if necessary, in consultation with the Cospas-Sarsat Secretariat.
