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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;

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- .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.