INTERNATIONAL STANDARD

IEC 61097-5

First edition
1997-12

Global maritime distress and safety system (GMDSS) –

Part 5: Inmarsat-E – Emergency position indicating radio beacon (EPIRB) operating through the Inmarsat system – Operational and performance requirements, methods of testing and required test results

Système mondial de détresse et de sécurité en mer (SMDSM) –

Partie 5: Inmarsat-E – Balises radioélectriques de position de détresse du système Inmarsat – Exigences d'exploitation et de fonctionnement, méthodes d'essai et résultats d'essai exigés

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Document Preview
IEC 61097-5:1997
https://standards.iteh.ai/catalog/standards/iec/39d6c030-6da2-4e16-afca-35569cae36c7/iec-61097-5-1997

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CONTENTS

Withdrawn
iTeh Standards
(https://standards.iteh.ai)
Document Preview

Clause Page

Withdrawn
iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61097-5:1997
https://standards.iteh.ai/catalog/standards/iec/9d6c030-6da2-4e16-afca-35569cae36c/iec-61097-5-1997

Clause Page

Annexes

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61097-5:1997
https://standards.iteh.ai/catalog/standards/iec/39d6c030-6da2-4e16-afca-35569cae36c7/iec-61097-5-1997
Withdrawn

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GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS) –

Part 5: Inmarsat-E – Emergency position indicating radio beacon (EPIRB) operating through the Inmarsat system – Operational and performance requirements, methods of testing and required test results

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FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61097-5 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

The text of this standard is based on the following documents:

FDIS	Report on voting
80/146/FDIS	80/163/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

Annexes A, B and C form an integral part of this standard.

The French version of this standard will be issued separately.

GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS) –

Part 5: Inmarsat-E – Emergency position indicating radio beacon (EPIRB) operating through the Inmarsat system – Operational and performance requirements, methods of testing and required test results

1 Scope

This part of IEC 61097 specifies the minimum operational and performance requirements, technical characteristics, methods of testing and required test results of the satellite emergency position indicating radio beacon used in the Inmarsat-E satellite system (satellite EPIRB), as required by Regulation IV/7.1.6 of the 1988 amendments to the 1974 International Convention for Safety of Life at Sea (SOLAS), and which is associated with IEC 60945. When a requirement in this standard is different from IEC 60945, the requirement in this standard shall take precedence.

This standard incorporates the performance standards of IMO Resolutions A.662(16) and A.812(19). It also incorporates the relevant ITU Radio-Regulations and the technical characteristics for satellite EPIRBs as contained in Recommendation ITU-R M 632-2 (formerly CCIR Recommendation 632), and takes account of the general requirements contained in IMO Resolution A.694(17), as detailed in IEC 60945.

This standard does not incorporate the Inmarsat system requirements needed for Inmarsat type approval and for which the latest edition of the Inmarsat-E System definition manual should be consulted. When a requirement in this standard is different from that in the Inmarsat-E System definition manual, reference shall be made to the most recent IMO and ITU applicable documents to resolve the difficulty.

This standard covers the following categories of satellite EPIRB:

Category 1 – Satellite EPIRB with position updating from the ship's navigational installation and 9 GHz SART.

Category 2 – Satellite EPIRB with position updating from an integral facility for automatic position updating.

Category 1 or 2 with the addition of a 121,5 MHz homing transmitter.

Category 1 or 2 with remote control meeting the requirements of Regulation IV subclauses 10.1.4.3 and 10.2.3.2.2 of the 1988 amendments to the 1974 SOLAS Convention.[1)]

Both categories of EPIRBs are to be considered as "portable", as defined in IEC 60945 except as required in 5.18.2 for the release mechanism. The remote control unit, if included, shall be considered as "protected" equipment.

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1) To meet the requirements for remote activation, a remote control unit is required which is capable of remote activation and deactivation and feeding "nature of distress" information to the satellite EPIRB.

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This standard also includes minimum performance standards for a manually activated satellite EPIRB without float-free release mechanism (see annex C).

Preconditioning as defined in IEC 60945 is not required before beginning the type testing procedure.

All text of this standard, the wording of which is identical to that in the IMO SOLAS Convention as amended and IMO Resolutions A.658(16), A.662(16), A.694(17), A.702(17) and A.812(19), and Recommendation ITU-R M.632-2 (formerly CCIR Recommendation 632) will be printed in italics and the resolution or recommendation and paragraph number indicated between brackets.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61097. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 61097 are encouraged to investigate the possibility of applying the most recent edition of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050:1970, *International Electrotechnical Vocabulary (IEV)*

IEC 60086-4:1996, *Primary batteries – Part 4: Safety standard for lithium batteries*

IEC 60945:1996, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61097-1:1992, *Global maritime distress and safety system (GMDSS) – Part 1: Radar Transponder – Marine search and rescue (SART) – Operational and performance requirements, methods of testing and required test results*

IEC 61108-1:1996, *Global navigational satellite systems (GNSS) – Part 1: Global positioning system (GPS) – Receiver equipment – Performance standards, methods of testing, and required test results*

International Convention on Safety of Life at Sea (SOLAS): 1974 as amended – *Chapter IV: Radiocommunications*

IMO Resolution A.658(16):1989, *Use and fitting of retro-reflective materials on life-saving appliances*

IMO Resolution A.662(16):1989, *Performance standards for float-free release and activation arrangements for emergency radio equipment*

IMO Resolution A.689(17):1991, *Testing of life-saving appliances*

IMO Resolution A.694(17):1991, *General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids*

IMO Resolution A.702(17):1991, *Radio maintenance guidelines for the GMDSS related to sea areas A3 and A4*

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IMO Resolution A.802(19):1995, *Performance standards for survival craft radar transponders for use in search and rescue operations*

IMO Resolution A.812(19):1995, *Performance standards for float-free satellite EPIRBs operating through the geostationary Inmarsat satellite system on 1,6 GHz*

IMO Resolution A.819(19):1995, *Performance standards for shipborne Global positioning system (GPS) receiver equipment*

International Telecommunication Union (ITU) Radio Regulations:1996

Recommendation ITU-R M.632-3 (formerly CCIR Recommendation 632):1997, *Transmission characteristics of a satellite emergency indicating radio beacon (Satellite EPIRB) system operating through geostationary satellites in the 1,6 GHz band*

Recommendation ITU-R M.690-1 (formerly CCIR Recommendation 690):1995, *Transmission characteristics of emergency position indicating radio beacons (EPIRBs) operating on the carrier frequencies of 121,5 MHz and 243 MHz*

Report ITU-R M.1178 (formerly report CCIR 1178) – *Efficient use of the band 1 544 MHz – 1 545 MHz and 1 645,5 MHz – 1 646,5 MHz*

Inmarsat:1997, *Inmarsat-E System Definition Manual (SDM)*

3 Definitions and abbreviations

Definitions, abbreviations and symbols listed hereunder are taken from IEC 60050: *International Electrotechnical Vocabulary (IEV)* or specially defined for use in this standard.

3.1 Definitions

For the purpose of this part of IEC 61097, the following definitions apply:

3.1.1
activation
a specific action or event which causes the satellite EPIRB to transmit distress alerts according to the specified time schedule

3.1.2
deactivation
a specific action or event which causes the transmitting satellite EPIRB to cease its activated mode until reactivated

3.1.3
equipment
a satellite EPIRB, its release mechanism and any remote control unit which may be associated with it

3.1.4
externally mounted equipment
units of the equipment intended for external (outside) mounting, namely the satellite EPIRB and its release mechanism

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IEC 61097-5:1997
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Withdrawn

3.1.5
frequency (message content test)
the frequency allocated to the message content test facility, namely 1 645 600 000 Hz (Channel 000) used for checking the message content by suitably qualified personnel equipped with a test receiver

3.1.6
frequency (operational)
early models of Inmarsat-E EPIRBs were required to transmit alternately in the frequency bands 1 644,3 MHz to 1 644,5 MHz and 1 645,6 MHz to 1 645,8 MHz to allow compatibility with the first and second generations of Inmarsat space segments. Inmarsat has now declared (1997-03-19) that the Inmarsat first generation space segment (spare and operational) has been completely replaced and that henceforth, all Inmarsat-E EPIRBs submitted to Inmarsat for type approval will be permitted to transmit in the frequency band from 1 645,6 MHz to 1 645,8 MHz only. With effect from June 1 1997, it will be mandatory for Inmarsat-E EPIRBs submitted for type approval to transmit in the band 1 645,6 MHz to 1 645,8 MHz only

3.1.7
frequency (type testing)
until further notice by Inmarsat, the operational frequency allocated for transmission during type testing shall be 1 645 799 800 Hz. Where the EPIRB transmits in both the 1st and 2nd generation space segment frequency bands, this frequency shall be used for type testing in both bands

3.1.8
internally mounted equipment
units of the equipment, e.g. remote control unit, intended for internal mounting (below deck)

3.1.9
Inmarsat-E SDM
Inmarsat-E System definition manual. A document produced and maintained by Inmarsat which gives all system technical requirements for the 1,6 GHz EPIRB and for its approval for utilisation of the space segment. It also reflects the applicable IMO performance requirements

3.1.10
peak effective power (PEP)
the average power during one radio frequency cycle at the crest of the modulation envelope (see annex B)

3.1.11
radiated power
the power supplied to the antenna by the transmitter (measured at the highest crest of the modulation envelope) multiplied by the gain of the antenna in a given direction

3.1.12
release mechanism
a fixture which allows the satellite EPIRB to float free automatically

3.1.13
remote control unit
a unit which allows the satellite EPIRB, while mounted in the release mechanism, to be activated from a position other than its installation point

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3.1.14
satellite EPIRB
an earth station in the mobile satellite service (MSS) the emissions of which are intended to facilitate search and rescue (SAR) operations

3.1.15
standby mode
the satellite EPIRB is ready to be activated, manually or automatically and thus capable of subsequent manual or automatic activation when floating free of its release mechanism

3.2 Abbreviations

eirp	equivalent isotropically radiated power
EPFD	Electronic Position Fixing Device
EPIRB	Emergency Position Indicating Radio Beacon
FSK	Frequency Shift Keying
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
IMO	International Maritime Organization
Inmarsat	International Mobile Satellite Organisation
MMSI	Maritime Mobile Service Identity
nm	nautical mile
PEP	Peak Effective Power
RHCP	Right Hand Circular Polarised
SAR	Search And Rescue
SART	Search and Rescue Radar Transponder
SOLAS	International Convention on Safety of Life at Sea

4 General and operational requirements

4.1 Purpose

This clause includes the requirements for which no repeatable or verifiable test can be specified or for which the test is limited to the verification of the documentation presented by the manufacturer. It contains all operational tests, particularly those involving subjective judgement and which shall be conducted by qualified personnel.

The requirements listed in this clause are in addition to the relevant requirements of 4.2 of IEC 60945.

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Document Preview
IEC 61097-5:1997
https://standards.iteh.ai/catalog/standards/iec/39d6c030-6da2-4e16-afca-35569cae36c7/iec-61097-5-1997