INTERNATIONAL STANDARD

IEC 61097-10

First edition
1999-06

Global maritime distress and safety system (GMDSS) –

Part 10:
Inmarsat-B ship earth station equipment – Operational and performance requirements, methods of testing and required test results

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

Partie 10: Matériel destiné aux stations terrestres des navires de type Inmarsat-B – Exigences d'exploitation et de fonctionnement, méthodes d'essai et résultats d'essai exigés

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For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams.*

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Part 10: Inmarsat-B ship earth station equipment – Operational and performance requirements, methods of testing and required test results

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 61097-10 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
80/216/FDIS	80/231/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.

Annex A forms an integral part of this standard.

Annexes B and C are for information only.

A bilingual version of this standard may be issued at a later date.

GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS) –

Part 10: Inmarsat-B ship earth station equipment – 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 for Inmarsat-B maritime class 1 ship earth stations (SES), capable of transmitting and receiving distress and safety communications using telephony and direct-printing telegraphy, as required by regulation IV / 10.1 and 14.1 of the 1988 amendments to the 1974 International Convention for the Safety of Life at Sea (SOLAS), for use in the GMDSS.

In order to meet the carriage requirements of the GMDSS in respect of receipt of SafetyNET broadcasts, it is necessary to install an additional EGC receiver or a combined Inmarsat-C/EGC receiver.

This standard takes account of IMO Resolution A.694, to which IEC 60945 is associated. When a requirement in this standard is different from IEC 60945, the requirement in this standard takes precedence.

This standard incorporates the performance standards of IMO Resolution A.808. It also incorporates the relevant ITU Radio regulations.

This standard does not incorporate the Inmarsat system requirements needed for Inmarsat type approval. For these, the latest edition of the Inmarsat-B system definition manual (SDM) shall be consulted. When a requirement in this standard is different from one in the Inmarsat-B SDM, reference shall be made to the most recent IMO and ITU applicable documents to resolve the difficulty.

NOTE – All text of this standard, the wording of which is identical to that in the IMO SOLAS Convention 1974 as amended and IMO Resolution A.808, is printed in *italics* and it is followed by 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. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61097 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

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

IEC 61162-1:1995, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners*

IMO International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended

IMO Resolution A.694:1991, *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.808:1995, *Performance standards for ship earth stations capable of two-way communications*

IMO MSC Circular 862:1998, *Clarifications of certain requirements in IMO performance standards for GMDSS equipment*

ITU:1997, *Radio Regulations*

ITU-R SM.329-7:1997, *Spurious emissions*

Inmarsat:1997, *Inmarsat-B system definition manual (SDM) – Issue 3.0 including change note CN 13 – technical performance requirements (module 2, part I) and type approval procedures (module 2, part II)*

Inmarsat:1997, *Inmarsat-B design and installation guidelines (DIGS)*

3 Definitions and abbreviations

3.1 Definitions

For the purpose of this standard, the following definitions apply:

3.1.1
L-band
the frequency band in the range 1,4 GHz to 1,7 GHz allocated to the mobile satellite service and in which the EUT transmits and receives

3.1.2
LES simulator
an item of test equipment designed to simulate the combined operation of an Inmarsat satellite and an Inmarsat-B land earth station. The LES simulator interfaces to the EUT at L-band, either by means of a small antenna or via a coaxial cable. It permits voice and telex calls to be set up in accordance with the relevant Inmarsat-B protocols

3.1.3
SafetyNET
a service provided over a dedicated Inmarsat-C carrier, for the dissemination of maritime safety information, such as distress alerts, weather forecasts and coastal warnings

3.1.4
carrier to noise density ratio
the ratio of unmodulated carrier power to noise power normalised to a 1 Hz bandwidth

3.1.5
performance check
in this standard, a performance check for the purpose defined in IEC 60945, comprises standard tests A and D in 6.2.2, carried out under normal test conditions for distress priority only

3.1.6
performance test
a performance test for the purpose defined in IEC 60945, comprises standard tests A, B, C, D and E in 6.2.2, carried out for both distress and safety priorities

3.2 Abbreviations

For the purpose of this standard, the following abbreviations apply:

C/No	Carrier to noise density ratio in a 1 Hz bandwidth
CR	Carriage return
DIGS	Design and installation guidelines (Inmarsat)
EGC	Enhanced group call
EUT	Equipment under test
GMDSS	Global maritime distress and safety system
ID	Identity
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
Inmarsat	International Mobile Satellite Organization
ISO	International Organization for Standardization
ITU	International Telecommunication Union
LES	Land earth station
LF	Line feed
MES	Mobile earth station
MSI	Maritime safety information
Navarea	Navigation warning area (see annex B)
RCC	Rescue co-ordination centre
SAR	Search and rescue
SDM	System definition manual
SES	Ship earth station
SOLAS	International convention for the Safety of Life at Sea

4 General and operational requirements

4.1 General

This clause includes the requirements taken from SOLAS and IMO Resolutions A.808 and A.694 for which no repeatable or verifiable test can be specified or for which the test is limited to the verification of 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 operational requirements of IEC 60945.

4.2 General requirements

4.2.1 (SOLAS IV/10.1.1) *An Inmarsat ship earth station* which is defined in the Inmarsat-B SDM as a maritime class 1 SES shall *be capable of:*

.1 transmitting and receiving distress and safety communications using direct-printing telegraphy;

.2 initiating and receiving distress priority calls;

.3 maintaining watch for shore-to-ship distress alerts, including those directed to specifically defined geographical areas. This requirement should normally be met by provision of an EGC receiver;

.4 transmitting and receiving general radio communications, using either radiotelephony or direct-printing telegraphy.

Annex C contains the anticipated availability of the watch-keeping capabilities for an Inmarsat-B SES.

4.2.2 (A.808/A.2) *The equipment* shall *be type approved by Inmarsat and shall comply with the environmental conditions specified in its technical requirements for Inmarsat ship earth stations capable of two-way communications.*

4.2.3 (A.808/A.1) *The ship earth station installation capable of telephony and direct printing shall comply with the applicable general requirements set out in IMO resolution A.694 (17)* as detailed in IEC 60945, except as follows:

4.2.3.1 The equipment shall indicate the status of the distress alert transmission (4.2.9 of IEC 60945).

4.2.3.2 The equipment shall be provided with facilities which permit the testing of all operational indicators (warning, alarm and routine), displays, and audible devices required by the relevant equipment standard (4.2.9 of IEC 60945).

4.3 Operational requirements for Inmarsat-B maritime class 1 SES

4.3.1 (A.808/A.3.1) *No control external to the equipment* shall *be available for alteration of the ship earth station identity.*

4.3.2 (A.808/A.3.2) *It* shall *be possible to initiate and make distress calls by telephony or direct printing from the position at which the ship is normally navigated and from any position designated for distress alerting. In addition, where a room is provided for radio communications, means to initiate distress calls* shall *also be fitted in that room.*

4.3.3 (A.808/A.3.3) Where no other means of receiving distress, urgency and safety broadcasts or an additional distress alert relay are provided and existing levels of aural signals produced by the telephone or teletype are considered to be inadequate, the ship earth station equipment shall be configured to actuate an aural/visual alarm of appropriate level.

4.3.4 (A.808/A.3.4) *It* shall *be possible to interrupt and initiate distress calls at any time.*

4.3.5 (A.808/A.3.5) *A distress call* shall *be activated only by means of a dedicated distress button. This button* shall *not be any key of an ITU-T digital input panel or an ISO keyboard provided on the equipment.*

(MSC/Circular 862/1.1) This button should not be any key of an ITU-T input panel or an ISO keyboard associated with the equipment and should be physically separated from functional buttons/keys used for normal operation. This button should be a single button for no other purpose than to initiate a distress alert.

4.3.6 (A.808/A.3.6) *The dedicated button* shall*:*

.1 be clearly identified; and

.2 be protected against inadvertent operation.

(MSC/Circular 862/1.2) The distress button should be red in colour and marked DISTRESS. Where a non-transparent protective lid or cover is used, it should also be marked DISTRESS.

(MSC/Circular 862/1.3) The required protection of the distress button should consist of a spring loaded lid or cover permanently attached to the equipment by for example hinges. It

should not be necessary for the user to remove additional seals or to break the lid or cover in order to operate the distress button.

4.3.7 (A.808/A.3.7) *The distress call initiation* shall *require at least two independent actions*.

(MSC Circular 862/1.4) Lifting of the protective lid or cover is considered the first action. Pressing the distress button as specified is considered as the second independent action.

4.4 Inter-operability

4.4.1 Where a unit of equipment provides a facility which is additional to the minimum requirements of this standard, and which has been accepted by the manufacturer of the EUT, the operation and, as far as is reasonably practicable, the malfunction of such additional facility shall not degrade the performance of the equipment (A.694/1.2).

4.4.2 If a unit of equipment is connected to one or more other units of equipment accepted by the manufacturer of the EUT, the performance of each of the latter shall be maintained (A.694/3.5).

4.5 Interfaces

4.5.1 An input shall be provided to comply with 4.3.2.

4.5.2 An output shall be provided to actuate an external aural/visual alarm on the receipt of a distress priority call (see 4.3.3).

4.5.3 An SES intended for installation on passenger ships shall have an interface to receive information on the ship's position for inclusion in the initial distress alert. Such interface shall comply with IEC 61162-1.

4.6 Safety

4.6.1 Radio frequency hazards

(A.808/A.4) *In order to permit warnings of potential hazards to be displayed in appropriate places, a label* shall *be attached to the radome indicating the distance at which radiation levels of 100 W/m^2, 25 W/m^2 and 10 W/m^2 exist.* The label shall have characters at least 20 mm high and be clearly readable in the normally installed position from a distance of at least 5 m.

4.6.2 Safety precautions

The EUT shall satisfy the requirements for safety as stated in A.694 and detailed in IEC 60945 (A.694/A.7).

4.7 Equipment manual

4.7.1 Adequate information shall be provided to enable the equipment to be properly installed, operated and maintained. The manual shall comply with the requirements of IEC 60945 as applicable, and shall:

.1 in the case of equipment so designed that fault diagnosis and repair down to component level are practicable, provide full circuit diagrams, component layouts and a component part list; and

.2 in the case of equipment containing complex modules in which fault diagnosis and repair down to component level are not practicable, contain sufficient information to enable a defective complex module to be located, identified and replaced. Other modules and those discrete components, which do not form part of modules, should also meet the requirements of .1 above (A.694/A.8.3).