

INTERNATIONAL STANDARD



**Global maritime distress and safety system (GMDSS) –
Part 4: Inmarsat-C ship earth station and Inmarsat enhanced group call (EGC)
equipment – Operational and performance requirements, methods of testing
and required test results**

IEC 61097-4:2012

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CONTENTS

| | |
|--|----|
| FOREWORD..... | 4 |
| 1 Scope | 6 |
| 2 Normative references | 6 |
| 3 Performance requirements..... | 7 |
| 3.1 Overview..... | 7 |
| 3.2 Non-operational requirements..... | 8 |
| 3.2.1 General..... | 8 |
| 3.2.2 Warning of radiation hazard..... | 8 |
| 3.2.3 Power supply changeover..... | 8 |
| 3.3 Operational requirements for ship earth stations..... | 8 |
| 3.3.1 Capabilities..... | 8 |
| 3.3.2 Ship station identity..... | 8 |
| 3.3.3 Distress alerting..... | 8 |
| 3.3.4 Position updating..... | 9 |
| 3.4 Operational requirements for EGC receivers..... | 9 |
| 3.4.1 Capabilities..... | 9 |
| 3.4.2 General..... | 10 |
| 3.4.3 Position and area code updating..... | 10 |
| 3.4.4 Indication of receipt of priority message..... | 10 |
| 3.4.5 Indication of tuning and synchronisation..... | 10 |
| 3.4.6 Printing selection..... | 11 |
| 3.4.7 Printing device..... | 11 |
| 3.5 Performance related requirements from IEC 60945..... | 11 |
| 3.6 Other requirements..... | 11 |
| 3.7 Long-range identification and tracking..... | 12 |
| 3.7.1 General..... | 12 |
| 3.7.2 Capabilities..... | 12 |
| 3.7.3 Functionality..... | 13 |
| 3.7.4 Communication system..... | 14 |
| 4 Technical characteristics..... | 14 |
| 4.1 Overview..... | 14 |
| 4.2 Environmental and electromagnetic compatibility requirement..... | 14 |
| 4.3 Radiated spurious emissions..... | 15 |
| 4.4 Interfaces..... | 15 |
| 5 Methods of testing and required test results..... | 15 |
| 5.1 Overview..... | 15 |
| 5.1.1 General..... | 15 |
| 5.1.2 Performance requirements..... | 16 |
| 5.1.3 Technical characteristics..... | 16 |
| 5.2 Tests of non-operational requirements..... | 16 |
| 5.3 Tests of operational requirements for ship earth stations..... | 16 |
| 5.3.1 Capabilities..... | 16 |
| 5.3.2 Ship station identity..... | 16 |
| 5.3.3 Distress alerting..... | 16 |
| 5.3.4 Position updating..... | 17 |
| 5.4 Tests of operational requirements for EGC receivers..... | 17 |

| | | |
|--------------|--|----|
| 5.4.1 | Capabilities | 17 |
| 5.4.2 | General | 17 |
| 5.4.3 | Position and area code updating | 17 |
| 5.4.4 | Indication of receipt of priority message..... | 17 |
| 5.4.5 | Indication of tuning and synchronisation | 18 |
| 5.4.6 | Printing selection | 18 |
| 5.4.7 | Printing device | 18 |
| 5.5 | Tests of performance related requirements from IEC 60945..... | 18 |
| 5.6 | Tests of other requirements | 18 |
| 5.7 | Long-range identification and tracking | 18 |
| 5.7.1 | General | 18 |
| 5.7.2 | Capabilities..... | 18 |
| 5.7.3 | Functionality | 19 |
| 5.7.4 | Communication system | 19 |
| 5.8 | Tests of technical characteristics | 20 |
| 5.8.1 | Inmarsat tests | 20 |
| 5.8.2 | Tests for environmental and electromagnetic compatibility | 20 |
| 5.8.3 | Interfaces | 20 |
| Annex A | (normative) Requirements relating to installation..... | 21 |
| Annex B | (normative) Radiated unwanted emissions..... | 22 |
| Annex C | (informative) Inmarsat RTP schedule of tests..... | 25 |
| Bibliography | | 29 |
| Table 1 | – Data to be transmitted from the shipborne equipment | 14 |
| Table 2 | – Environmental conditions..... | 15 |
| Table B.1 | – Limits of unwanted emissions up to 1 000 MHz | 22 |
| Table B.2 | – Limits of unwanted emissions above 1 000 MHz..... | 23 |
| Table B.3 | – Limits of unwanted emission within the operating band with carrier-on..... | 24 |
| Table C.1 | – Phase I Inmarsat-C schedule of tests | 25 |
| Table C.2 | – Phase I EGC receiver schedule of tests | 27 |
| Table C.3 | – Phase II schedule of tests | 28 |

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**GLOBAL MARITIME DISTRESS
AND SAFETY SYSTEM (GMDSS) –**

**Part 4: Inmarsat-C ship earth station and
Inmarsat enhanced group call (EGC) equipment –
Operational and performance requirements,
methods of testing and required test results**

FOREWORD

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IEC 61097-4 edition 3.1 contains the third edition (2012-05) [documents 80/659/FDIS and 80/666/RVD] and its amendment 1 (2016-08) [documents 80/789/CDV and 80/808/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 61097-4 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This edition constitutes a technical revision. The main changes with respect to the previous edition are:

- the IMO references and requirements have been updated to the new performance standards for enhanced group call equipment adopted in 2010 as resolution MSC.306(87). The new performance standards incorporate new requirements for an indication of ship's position which has not been updated (3.4.3) and an alarm for paper low condition (3.4.7). These two requirements are, however, derived from Inmarsat documentation so there is no technical change to equipment;
- a new subclause has been added (3.7) concerning long-range identification and tracking (LRIT) to support IMO performance standards given in resolution MSC.263(84) adopted in 2008;
- references to Inmarsat documentation have been simplified by moving the content of Tables 1, 2, 4 and 5 into a new Annex C;
- the text has been editorially updated to conform to the ISO/IEC Directives.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 61097 series, published under the general title *Global maritime distress and safety system (GMDSS)*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS) –

Part 4: Inmarsat-C ship earth station and Inmarsat enhanced group call (EGC) equipment – Operational and performance requirements, methods of testing and required test results

1 Scope

This part of IEC 61097 specifies the performance requirements and methods of testing for Inmarsat-C ship earth stations (SES) capable of transmitting and receiving direct-printing communications, and for enhanced group call (EGC) receivers, for use in the GMDSS and for use for long-range identification and tracking (LRIT). The available variants are:

- Class 0: An EGC receiver, either stand-alone or an element of a GMDSS installation in accordance with the Inmarsat design and installation guidelines (DIGs) for GMDSS installations.
- Class 1: A basic SES providing shore-to-ship and ship-to-shore message transfer only.
- Class 2: As class 1 but with EGC as an alternative to shore-to-ship transfer using a shared receiver.
- Class 3: As class 1 but with EGC using an independent receiver.

NOTE 1 The 34th session of the IMO Sub-Committee on Radiocommunications decided that class 2 equipment would be adequate to provide sufficient availability for the reception of maritime safety information for the GMDSS.

The standard complies with IMO performance requirements stated in the normative references, Inmarsat technical characteristics and test procedures, and IEC 60945 general requirements except where modifications are explicitly stated in this standard. Technical characteristics essential to GMDSS and LRIT operation as defined by the IMO are identified.

All text of this standard, whose wording is identical to that in IMO SOLAS Convention 1974 as amended in 1988 and Resolutions A.807(19), MSC.263(84) and MSC.306(87) is printed in *italics* and reference made to the Resolution/Recommendation and subclause number.

This standard covers equipment construction and testing. Matters relating to installation may also be found in the Inmarsat Maritime design and installation guidelines (see Bibliography). Those to be found in IMO Resolutions A.807(19), MSC.263(84) and MSC.306(87) are reproduced in Annex A.

Responsibility for type approval of Inmarsat-C and Inmarsat-EGC is vested in Inmarsat by IMO Resolutions A.807(19) and MSC.306(87) (see 3.2.1). Therefore, this standard does not reproduce Inmarsat test procedures in full, but refers to where they are given in Inmarsat documentation cited in the normative references to this standard (Annex C).

NOTE 2 For the purposes of this standard the terms Inmarsat-C, Inmarsat Standard-C, Standard-C refer to the same equipment.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945:2002, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61108 (all parts), *Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS)*

IEC 61162-1, *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(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.807(19):1995, *Performance Standards for INMARSAT-C ship earth stations capable of transmitting and receiving direct-printing communications as amended by Resolution MSC.68(68) Annex 4*

IMO Resolution MSC.263(84):2008, *Revised performance standards and functional requirements for the long-range identification and tracking of ships.*

IMO Resolution MSC.306(87):2010, *Revised performance standards for enhanced group call (EGC) equipment*

Inmarsat, *Inmarsat-C System definition manual (SDM) Volume 2 – Part 2, Application Note 2, Position reporting service*

Inmarsat, *Inmarsat-C System definition manual (SDM) Volume 2 – Part 2, Application Note 3, Application developers guide to data reporting and polling*

Inmarsat, *Inmarsat-C System definition manual (SDM) Volume 3 – Part 2, Chapter 2, Mobile earth station technical requirements*

Inmarsat, *Inmarsat-C System definition manual (SDM) Volume 3 – Part 2, Chapter 5, Ship earth station technical requirements*

Inmarsat, *Inmarsat-C System definition manual (SDM) Volume 3 – Part 2, Chapter 8, Technical requirements for an EGC receiver*

Inmarsat, *Recommended test procedures (RTP) for the type approval of Inmarsat-C mobile earth stations*

3 Performance requirements

3.1 Overview

Subclauses 3.2 through 3.4 of this standard describe performance requirements directly attributable to IMO Resolutions A.807(19) and MSC.306(87) as listed in the normative references. Subclause 3.5 is provided to highlight those requirements of IMO Resolution A.694(17) which are not included in the normal Inmarsat requirements for Inmarsat-C SES type approval. Subclause 3.6 describes other requirements which are required to make the equipment suitable for GMDSS applications. Subclause 3.7 describes performance requirements attributable to IMO Resolution MSC.263(84) for long-range identification and tracking.

3.2 Non-operational requirements

3.2.1 General

(A.807(19) A1.1/MSC.306(87) A1.1) *The Inmarsat Standard-C ship earth station installation capable of transmitting and receiving direct-printing communications, and the enhanced group call equipment to be used in the GMDSS shall comply with the general requirements set out in Assembly resolution A.694(17) as detailed in IEC 60945 and this IEC standard.*

(A.807(19) A2/MSC.306(87) 2) *The ship earth station and the EGC equipment shall be type-approved by Inmarsat and shall comply with the environmental conditions and electromagnetic compatibility requirements specified in IEC 60945.*

3.2.2 Warning of radiation hazard

(A.807(19) A4) *In order to permit a warning of potential radiation hazards to be displayed in appropriate locations, a label shall be attached to the radome indicating the distances external to the radome at which radiation levels of 100 W/m², 25 W/m² and 10 W/m² exist. However, the distances which are within the radome need not be indicated.*

NOTE Due to the low transmitted power of Inmarsat-C transmitters (less than 16 dBW) and the omnidirectional antenna used, this label is not normally required.

3.2.3 Power supply changeover

(See 5.2)

(A.807(19) A5.2/MSC.306(87) A4.2) *Changing from one source of supply to another or any interruption of up to 60 s duration of the supply of electrical energy shall not require the equipment to be manually re-initialized and shall not result in loss of received messages stored in the memory.*

3.3 Operational requirements for ship earth stations

3.3.1 Capabilities

(See 5.3.1)

The equipment shall comply with regulations IV/8 through IV/10 of SOLAS 1974, as amended, which prescribe the capabilities of Inmarsat ship earth stations to meet the GMDSS requirements for ships in the various sea areas. The four capabilities are:

- (SOLAS IV/8.1.5.1/IV/9.1.3.3 and IV/10.1.4.3): *means of initiating the transmission of ship-to-shore distress alerts.*
- (SOLAS IV/10.1.1.1): *transmitting and receiving distress and safety communications using direct-printing telegraphy.*
- (SOLAS IV/10.1.1.2): *initiating and receiving distress priority calls.*
- (SOLAS IV/9.3.2/IV/10.1.1.4): *transmitting and receiving general radiocommunications, using either radiotelephony or direct-printing telegraphy.*

NOTE In the case of this equipment only direct-printing telegraphy applies.

3.3.2 Ship station identity

(See 5.3.2)

(A.807(19) A3.1): *No control external to the equipment shall be available for alteration of the ship station identity.*

3.3.3 Distress alerting

(See 5.3.3)

(A.807(19) A3.2): *It shall be possible to initiate and make distress calls from the position from which the ship is normally navigated and from at least one other position designated for distress alerting.*

(A.807(19) A3.3): *A distress alert 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.*

(A.807(19) A3.4): *The dedicated distress button shall:*

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

(A.807(19) A3.5): *The distress alert initiation shall require at least two independent actions.*

(A.807(19) A3.6): *The equipment shall indicate the status of the distress alert transmission.*

(A.807(19) A3.7): *It shall be possible to interrupt and initiate distress messages at any time.*

It shall be possible to select the content of, but not initiate a distress alert using the equipment keyboard or other means, before depressing one of the dedicated buttons to initiate the distress alert. It shall also be possible to activate an undesignated (see Note) distress alert by depressing one of the buttons, at any time.

NOTE Undesignated – unspecified distress alert, i.e. the default setting. All other selectable alerts are "designated".

3.3.4 Position updating

(See 5.3.4)

(A.807(19) A3.8): *Facilities shall be provided to automatically update the ship's position and the time at which the position was determined from a suitable electronic position-fixing aid which may be an integral part of the equipment. For equipment which does not have an integral position-fixing aid, such facilities shall include a suitable interface conforming to IEC 61162.*

The integral electronic position-fixing aid shall comply with the applicable requirements of the IEC 61108 series.

As a minimum, the interface shall support the sentences GNS, RMC and ZDA described in IEC 61162-1.

(A.807(19) A3.9): *Provision shall also be made for manual entry of position information and of the time at which the position was determined.*

(A.807(19) A3.10): *An alarm shall be activated when no position data is received from the electronic position-fixing aid or, in the case of manual input, the position information is over 4 hours old. Any position information not updated for more than 24 hours shall be clearly identified. See also 3.4.3.*

NOTE Subclause 3.3.7, which is referenced in the Inmarsat-C SDM, is 3.3.3 in this edition of this standard.

3.4 Operational requirements for EGC receivers

3.4.1 Capabilities

(See 5.4.1)

The equipment shall comply with regulations IV/7 and IV/10 of SOLAS 1974, as amended, which prescribe the capabilities of EGC receivers to meet the GMDSS requirements for ships in the various sea areas. The two capabilities are:

- (SOLAS IV/7.1.5): a radio facility for reception of maritime safety information by the Inmarsat enhanced group calling system.
- (SOLAS IV/10.1.1.3): an Inmarsat ship earth station capable of maintaining watch for shore-to-ship distress alerts, including those directed to specifically defined geographical areas.

3.4.2 General

(See 5.4.2)

(MSC.306(87) A1.2): The equipment shall be capable of producing a printed copy of received information. Received EGC messages may be stored, for later printing with an indication to the operator that the message has been received, except for the vital messages referred to in A.3.2 which shall be printed out upon receipt.

(MSC.306(87) A1.3): The enhanced group call installation may be either separate or combined with other installations. Elements of other installations, e.g. the antenna, low noise amplifier and down converter of the ship earth system, may be shared for the reception of enhanced group call messages.

3.4.3 Position and area code updating

(See 5.4.3)

(MSC.306(87) A3.1): The equipment shall provide a visual indication that the ship's position has not been updated during the last 12 hours. It shall only be possible to reset this indication by revalidating the ship's position. See also 3.3.4.

(MSC.306(87) A3.2): Means shall be provided to enter the ship's position and current and planned NAVAREA/METAREA codes manually so that area group calls can be received. Means shall also be provided to enter current and planned coastal warning service coverage areas and different classes of messages. Optionally, the ship's position, as determined by the navigational equipment may be entered automatically and the NAVAREA/METAREA code automatically derived therefrom.

NOTE NAVAREAs and METAREAs are geographical sea areas established for the purpose of co-ordinating the broadcast of navigational and meteorological safety information. The world is currently divided into 21 areas (I to XXI). The boundaries are shown in the IMO International SafetyNET Manual.

3.4.4 Indication of receipt of priority message

(See 5.4.4)

(MSC.306(87) A3.3): Provision shall be made for a specific aural alarm and visual indication at the position from which the ship is normally navigated to indicate receipt of a distress or urgency priority EGC message. It shall not be possible to disable this alarm and it shall only be possible to reset it manually and only from the position where the message is displayed or printed.

3.4.5 Indication of tuning and synchronisation

(See 5.4.5)

(MSC.306(87) A3.4): The equipment shall indicate when it is not correctly tuned or synchronized to the enhanced group call carrier.