



***GLOBAL MARITIME DISTRESS AND  
SAFETY SYSTEM  
(GMDSS) Guide  
for  
U.S Flagged Vessels***

## **Purpose**

This Guide represents the OCS NCOE's interpretation of the applicable rules and regulations regarding GMDSS with the intention of being used for training and guidance.

The goal is to provide the user of this guide with a simplified summary of the requirements regarding GMDSS. We hope this goal is met and you find this guide, as well as other books and materials that we produce, helpful.

If you have any recommendations or you would like to provide feedback about this, or other publications and materials, please contact the OCS NCOE via one of the following methods

Email: [HQS-DG-OCS-NCOE@uscg.mil](mailto:HQS-DG-OCS-NCOE@uscg.mil)

Website: [www.dco.uscg.mil/OCSNCOE](http://www.dco.uscg.mil/OCSNCOE)

## **Revisions:**

Changes to this guide from the previous version will be highlighted.

Changes on this guide are found on: Title Page, this page, page 1, page 2, page 4, page 5, page 11, page 12, page 13, page 14, and page 16.

## Table of Contents

Purpose.....	i
Objective.....	1
What is GMDSS.....	1
GMDSS Compliance Determination.....	1
GMDSS Applicability & Compliance.....	2
Nine Functional Requirements.....	3
GMDSS Equipment Requirements .....	4
• GMDSS Equipment for All Ships.....	4
• GMDSS Equipment Summarized per Sea Area.....	5
GMDSS Maintenance .....	5
GMDSS Operators.....	6
Position Updating.....	6
Ship Source of Energy.....	7
Record Keeping .....	7
Required Documents .....	9
GMDSS Reference Chart.....	10
Additional References.....	11
Glossary.....	13
Terms and Definitions .....	14

## Objective

Provide summarized guidance and information regarding GMDSS operations, standards, and regulatory references for conducting GMDSS inspections/examinations. For more information regarding GMDSS carriage, compliance, and/or any other information regarding radio requirements, refer to 47 CFR Part 80 and/or 1974 SOLAS 14 Chapter IV Radio-communications.

## What is GMDSS

GMDSS is a worldwide coordinated maritime distress system designed to provide the rapid transfer of distress messages from vessels in distress to units best suited for providing or coordinating assistance. The system provides a link between SAR authorities ashore and shipping in the immediate vicinity of a vessel in distress or in need of assistance so that both land and sea resources can assist in coordinated SAR operations with minimal delay.

GMDSS is a combination of systems and sub-systems using both satellite and terrestrial communication systems to fulfill the nine functional requirements which are listed in the Functional Requirements section of this Guide.

Some components of the GMDSS may be required by other regulations. However, if the components make up part of the ship's GMDSS, then the GMDSS regulations (47CFR § 80. 1103) require that the components be certified for GMDSS use.

For example: the Marine VHF, SSB, and EPIRB carriage requirements can be found elsewhere in regulations, but if these systems are used to meet the GMDSS requirements, then these systems must be certified for GMDSS use.

## GMDSS Compliance Determination

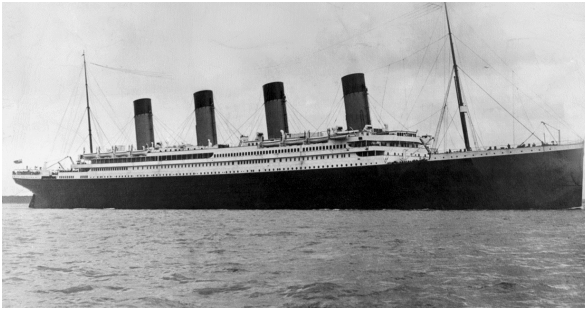
Other than the Cargo Ship Safety Radio Certificate (Form "R"), the USCG does not issue licenses or documents related to the carriage or use of radio equipment. The licenses and inspection documents are issued by the FCC or their authorized representative.

The USCG may inspect/examine: documentation/certification, log entries, maintenance requirements, tests, and test procedures to determine the ship's compliance with the GMDSS requirements.

Additionally, the USCG should inspect/examine the GMDSS Operator's licenses and credentials, and test the operator's competency/ability to communicate on at least two systems.

**COIs should not be issued or endorsed unless a vessel is in compliance with FCC regulations (NVIC 3-99).**

## GMDSS Applicability & Compliance



**47 CFR § 80.1065 (a)** – all passenger ships regardless of size and cargo ships of 300 tons gross tonnage and upwards.

### **47 CFR § 80.86 International regulations applicable:**

In addition to being regulated by these rules, the use and operation of stations subject to this part are governed by the Radio Regulations and the radio provisions of all other international agreements in force to which the US is a party.

**U.S. Communication Act:** Each vessel of the United States to which the Safety Convention applies shall comply with the radio and communications provisions of said Convention at all times while the vessel is in use, in addition to all other requirements of law, and shall have on board an appropriate certificate as prescribed by the Safety Convention.

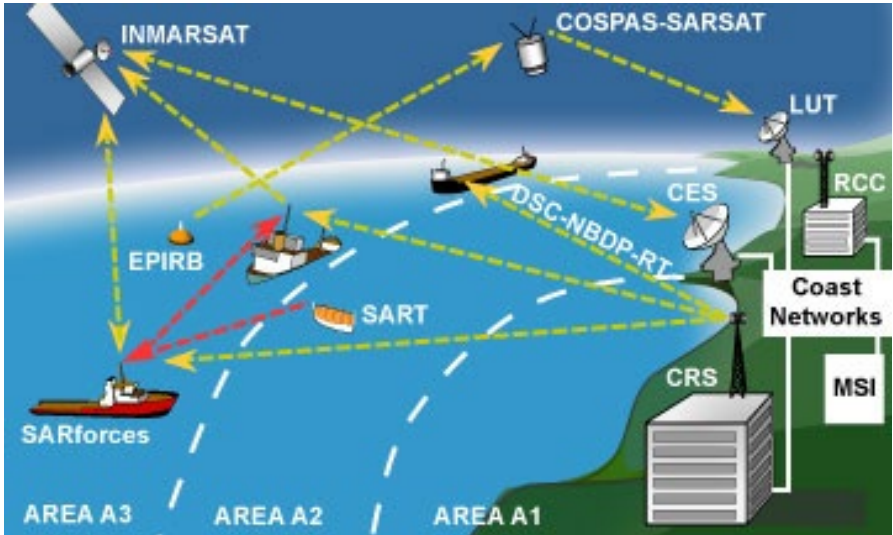
Notwithstanding any provisions of this Act or any other provision of law or regulations, a ship documented under the laws of the United States operating in accordance with the Global Maritime Distress and Safety System provision of the Safety of Life at Sea Convention shall not be required to be equipped with a radio telegraphy station operated by one or more radio officers or operators. This section shall take effect for each vessel upon a determination by the United States Coast Guard that such vessel has the equipment required to implement the Global Maritime Distress and Safety System installed and operating in good working condition.

**SOLAS:** Ships subject to the **Chapter IV of 1974 SOLAS, as amended**, must be outfitted with GMDSS equipment. These include all ships engaged on international voyages except:

- Cargo ships < 300 gross tonnage,
- Ships of war and troopships,
- Ships not propelled by mechanical means,
- Wooden ships of primitive build,
- Pleasure yachts not engaged in trade,
- Fishing vessels, and
- Ships being navigated within the Great Lakes of North America.

**Chapter IV of 1974 SOLAS, as amended** – all ships to which the present regulations apply and to cargo ships of 300 gross tonnage and upwards.

## Nine Functional Requirements



## Nine Functional Requirements

Ships while at sea must be able to:

### **Transmit and Receive**

1. Ship-to-Shore \*
2. Shore-to-Ship distress alerts
3. Ship-to-ship distress alerts
4. SAR coordinating communications
5. On-scene communications
6. Locating signals
7. Marine Safety Information
8. General radio communications to and from shore
9. Bridge-to-bridge communications

\* Ships must be capable of transmitting a ship-to-shore distress alert by two separate and independent means.

## GMDSS Equipment Requirements



### GMDSS Equipment for All Ships

#### 406 EPIRB:

- A 406 Satellite EPIRB is a requirement of GMDSS for the purpose of transmitting a distress alert signal ashore and for transmitting homing and locating signals. This EPIRB must be mounted in a hydrostatic release bracket in a float free location.

#### RADAR or AIS SART (Search and Rescue Transponder):

- Cargo ships/MODUs >300GT but <500GT are required to carry **one** SART.
- Cargo ships >500GT and all passenger ships are required to carry **two** SARTs, one on each side of vessel, ready to be taken to survival craft.
- On ships carrying at least two SARTs and equipped with free-fall lifeboats one of the SARTs shall be stowed in a free-fall lifeboat and the other located in the immediate vicinity of the navigation bridge.

#### Survival Craft Radiotelephones:

- Emergency VHF transceivers that operate on VHF CH 16 and one other channel (VHF CH 06 is recommended).
- Cargo ships/MODUs >300 but <500GT are only required to carry **two** VHF transceivers.
- Cargo ships/MODUs >500GT and all passenger ships are required to carry **three** VHF transceivers.
- A transceiver permanently installed in a survival craft may count towards this requirement.

#### VHF Installation:

- Capable of operating on VHF CH's 06, 13 and 16.
- Programmed with the ship license MMSI.
- Capable of maintaining continuous DSC monitoring on VHF CH 70.
- Capable of initiating digital selective calling distress alert transmissions on CH 70.

#### NAVTEX:

- One NAVTEX receiver is required. Where NAVTEX service is not available, the vessel must have Enhanced Group Calling systems through Inmarsat or Iridium satellite systems, or HF narrowband direct printing (NBDP) telegraphy to receive MSI.

## GMDSS Equipment Summarized per Sea Area

<b>Sea Area A1</b> <ul style="list-style-type: none"><li>➤ VHF Installation</li><li>➤ 406 EPIRB</li></ul>
<b>Sea Area A2</b> <ul style="list-style-type: none"><li>➤ VHF Installation</li><li>➤ MF Installation</li><li>➤ 406 EPIRB</li></ul>
<b>Sea Area A3</b> <ul style="list-style-type: none"><li>➤ VHF Installation</li><li>➤ MF/HF Installation <b>or</b> IMO Recognized Mobile Satellite Service Installation (e.g., Inmarsat or Iridium)</li><li>➤ 406 EPIRB</li></ul>
<b>Sea Area A4</b> <ul style="list-style-type: none"><li>➤ VHF Installation</li><li>➤ MF/HF Installation</li><li>➤ 406 EPIRB</li></ul>

**Note:** For the complete lists of GMDSS carriage requirements, see 47 CFR § 80.1083 and/or 1974 SOLAS consolidated edition 2014, Chapter IV.

## GMDSS Maintenance

<ul style="list-style-type: none"><li>➤ The main components installed so they can be replaced readily, without recalibration or readjustment.</li><li>➤ Equipment shall be readily accessible for inspection and on-board maintenance.</li><li>➤ Information available on board for the equipment to be properly operated and maintained.</li><li>➤ Adequate tools and spares shall be provided to enable the equipment to be maintained.</li></ul>
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## Maintenance Options

<ul style="list-style-type: none"><li>➤ Duplicate equipment</li><li>➤ Shore Based maintenance *</li><li>➤ At Sea maintenance **</li></ul>
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\* If this option is chosen, verify certificate from shore-based company.

\*\* If this option is chosen, verify mariner's credential as a GMDSS Maintainer and spare parts/tools available.



## Maintenance Option Requirements

Vessel's operating in the following Sea Area must ensure availability of maintenance options as applicable:

### **Sea Areas A1 or A2**

- Any **1 of the 3** maintenance options.

### **Sea Areas A3 or A4**

- Any **2 of the 3** maintenance options.

**Note:** Duplicate equipment and Shore Based maintenance options are the most commonly chosen.

## GMDSS Operators

The image shows two FCC Radio Operator License Applications. The top form is for a GMDSS Radio Operator/Endorsement License, and the bottom form is for a GMDSS Radio Operator/Endorsement License. Both forms include fields for Name, Date of Birth, and License Information.

The image shows two Coast Guard GMDSS Operator Training and Endorsement Certificates. The top certificate is for a GMDSS Operator/Endorsement License, and the bottom certificate is for a GMDSS Operator/Endorsement License. Both certificates include fields for Name, Date of Birth, and License Information.

Each Officer in Charge of a Navigational Watch, plus the Master shall be licensed and credentialed as GMDSS Operator. One of the operators shall be designated as the primary operator. But, they all must be capable of performing distress, urgency and safety communications.

The GMDSS operator required compliment will be posted on the vessel's COI or Safe Manning Certificate.

**Note:** The FCC has requirements for GMDSS Radio Operator licensing (left picture) and the Coast Guard has requirements for GMDSS Radio Operator training and endorsing the mariner's credentials (right picture).

## Position Updating

All two-way communication equipment carried on board a ship which must comply with GMDSS requirements and which are capable of automatically including the ship's position in the distress alert shall be automatically provided with this information from an internal or external navigation receiver, if either is installed. If such a receiver is not installed, the ship's position and the time at which the position was determined shall be manually updated at intervals not exceeding 4 hours while the ship is under way.

## Ship Source of Energy

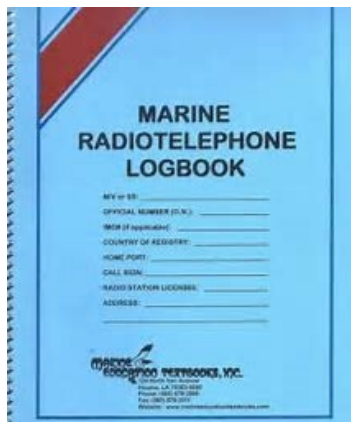
There must be available at all times, while the ship is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used as part of a reserve source of energy for the radio installations.

**Reserve power** must meet either six **(6) hour** or **one (1) hour** requirement.

- **Six hours** for ships constructed before February 1, 1995, or ships that do not meet the emergency power requirements of SOLAS, Chapter II-1, Regulation 42 or 43.
- **One hour** for ships constructed after February 1, 1995, or older ships that voluntarily comply with SOLAS, Chapter II-1, Regulation 42 or 43.

## Record Keeping

(U.S. Flag Vessel Requirements)



## General Requirements

- Orderly Manner.
- No erasures.
- Vessel's Name, ID, Flag, Official Number.
- Operator responsible for logs.

## Availability & Retention

- 2 years, or
- 3 Years if related to distress or disaster.
- Indefinitely if the commission notifies the licensee of an investigation and until the licensee is authorized in writing to destroy them.

## Ships Radio Telephone Logs

### **Daily:**

- Summary of all distress and urgency alerts affecting own station.
- Summary of safety communications on other than VHF.
- Time of any transmission of a false distress, urgency and safety alerts, and the time and method of cancellation.
- Satisfactory results of Pre-departure and daily tests.
- Statement as to the condition of the radio telephone equipment on board as determined by normal use or tests communications.

### **Weekly:**

- Proper functioning of DSC equipment as determined through actual use or tests calls.
- Emergency VHF's and SARTs have been tested.
- EPIRB has been inspected.

### **Per Occurrence:**

- Once **every 30 days**, the results of the battery tests for reserve source of energy.
- All results of required equipment tests including the specific gravity and voltage of the batteries tested.
- All results of tests and inspection of the lifeboat radio equipment.
- Any time the Master is notified of faulty radio equipment.
- The time and position information of all equipment that was updated with the vessel's current position **every 4 hours** (watch change) if the position information is not automatically updated.
- Any faults or repairs to GMDSS including any replacement of equipment.

## Required Documents

### **SOLAS:**

- Cargo Ship Safety Radio Certificate (CSSRC)
- A Record of Equipment (Form R) attached to CSSRC.
- International Code of Signals
- International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual

### **Radio Regulations:**

- Station License
- Operator License
- Radio Logs
- List of Ship Stations
- List of Coast Station \*
- Manual for Use by the Maritime Mobile and Maritime Mobile-Satellite Service \*

### **COMSAR/Circ. 32:**

- User's manual for all radio equipment and battery chargers
- Specifications and battery capacity calculations for the installed batteries
- Documents required by Radio Regulations

### **FCC:**

- Station License
- Operator License
- Radio Logs
- Appropriate Safety Convention Certificate
- Part 80; FCC Rules and Regulations
- Alphabetical List of Maritime Mobile Call Signs
- Manual for Use by the Maritime Mobile and Maritime Mobile-Satellite Service
- List of Radiodetermination and Special Service Stations
- List of Ship Stations
- List of Coast Station
- GMDSS Master Plan \*\*
- NGA Publication 117 \*\*
- Admiralty List of Radio Stations \*\*
- IMO Circ 7 \*\*

\* Administrations can exempt the List of Coast Stations and MMMSS Manual if there the ship carries equivalent information for the area of operation.

\*\* The requirements for having the GMDSS Master Plan, NGA Publication 117, Admiralty List of Radio Signals or IMO Circ. 7 are satisfied by having any one of those four documents.

## GMDSS Reference Chart

The **Items in Bold** listed in the first column of the Reference Chart are those items applicable to **ALL** vessels required to comply with GMDSS regulations/standards (unless “exempt” by the Administration).

- The bullets below each of the **Items in Bold** are some examples of items that might be checked but may or may not be “applicable”. A thorough read of the applicable regulations/standards is required to make that determination.

<b>GMDSS Inspection/Examination Items</b>	<b>U.S. Regulations</b>	<b>International Requirements</b>
<b>Station License</b>	47CFR 80.13 47CFR 80.405	COMSAR/Circ. 32, 1.7 Radio Regulations Annex 8-2
<b>Cargo Ship Safety Radio Certificate/ Form R</b>	46CFR 2.01-25 MSM Vol. II E2.K	SOLAS 14 I Part B
<b>Safety Inspection Certificate</b>	47CFR 80.1067	COMSAR/Circ. 32, 1.10
<b>Radio Records</b> <ul style="list-style-type: none"> <li>• Orderly Manner/Retention</li> <li>• Station Information (vessel name, country, official #)</li> <li>• Summary of Distress, Urgency and Safety Communications</li> <li>• Records of Inspections &amp; Tests of Equipment</li> <li>• Pre-departure Checks/Tests</li> <li>• Operator on watch</li> </ul>	47CFR 80.1075 47CFR 80.409 (a), (b) & (e). MOC Policy Ltr 04-02	SOLAS 14 IV/17 Radio Regulations Annex 8-13
<b>GMDSS Manuals</b> <ul style="list-style-type: none"> <li>• GMDSS Master Plan</li> <li>• List of Coast Stations</li> <li>• List of Ship Stations</li> <li>• International Code of Signals</li> <li>• Pub 117 Radio Navigational Aids</li> <li>• IAMSAR Manual</li> </ul>	47CFR 80.401 47CFR 80.1085(b)	SOLAS 14 V/21 COMSAR/Circ. 32, 1.4 Radio Regulations Annex 8-13
<b>Equipment for Applicable Sea Areas</b> <ul style="list-style-type: none"> <li>• General Equipment</li> <li>• Sea Areas (A1, A2, A3, A4)</li> <li>• Survival Craft Equipment</li> </ul>	47CFR 80.1085, 1087, 1089, 1091, 1093 & 1095 MOC Policy Ltr 04-02 NVIC 3-99	SOLAS 14 IV/6-11 COMSAR/Circ. 32, 2
<b>At Sea Watches</b> <ul style="list-style-type: none"> <li>• VHF, MF/HF, Inmarsat</li> <li>• MSI (NAVTEX, HF NBDP, Inmarsat “Safety Net”, Iridium “Safety Cast”)</li> </ul>	47CFR 80.1123 47CFR 80.1091(a)(1)(iii)	SOLAS 14 IV/12 GMDSS Master Plan, Annex 5: Maps, Fig. 1-16 Radio Regulations Annex 8-6, Sect. III

<b>Ship Station ID (MMSI) Programmed in DSC Equipment</b>	47CFR 80.103 47CFR 80.1083(b)(5)	SOLAS 14 IV/5.1 SOLAS 14 IV/6.2.5 COMSAR/Circ. 32, 1.7
<b>Maintenance Requirement Compliance</b> <ul style="list-style-type: none"> <li>Maintenance Options (Shore Side, Duplication of Equipment, On Board Maintainer)</li> <li>Spare Parts/Equipment/Tools/Manufacturer's Manuals</li> </ul>	47CFR 80.1105 MOC Policy Ltr 04-02 NVIC 3-99	SOLAS 14 IV/15 COMSAR/Circ. 32,1.4, 1.5 & 1.6
<b>Sources of Energy</b>	47CFR 80.1099	SOLAS 14 IV/13 COMSAR/Circ. 32, 7
<b>GMDSS Operators</b> <ul style="list-style-type: none"> <li>GMDSS Credentials/Training</li> <li>GMDSS Radio Operator's License</li> <li>Minimum # required are on board</li> </ul>	47CFR 80.1073 47CFR 13.201 46CFR 11.604 MOC Policy Ltr 04-02 NVIC 3-99	SOLAS 14 IV/16 Radio Regulations Annex 8-13 STCW Code A-IV/2 STCW Code B-IV/2
<b>GMDSS Operator Competence</b> <ul style="list-style-type: none"> <li>Ability to Receive MSI</li> <li>Operation of 2 Separate Systems</li> <li>Position Updates</li> <li>DSC Operations</li> </ul>	47CFR 80.1073 COMDTINST 16000.74 E2.K	Radio Regulations Annex 8-10 STCW Code A-IV/2 STCW Code B-IV/2

**Note:** Subchapters T, I, and L state that the vessel shall comply with 47CFR Part 80. The domestic regulations are listed under the "U.S. Regulations" column above. Vessels on international voyages and/or are required to meet SOLAS must comply with the requirements listed under the "International Requirement" column above.

### Additional References

**NVIC 3-99(5)(e):** The C.G. does not have the authority to grant extensions or waivers, nor issue CG-835s for GMDSS deficiencies found on U.S. flagged vessels, as these are the responsibility of the FCC under their regulations. COIs should not be issued or endorsed unless a vessel is in compliance with FCC regulations.

### **47 CFR § 80.59 Compulsory Ship Inspection.**

- (a) Inspection of ships subject to the Communications Act or the Safety Convention...
- (1) The FCC will not normally conduct the required inspections of ships subject to the inspection requirements of the Communications Act or the Safety Convention.
- (2) A certification that the ship has passed an inspection must be entered into the ship's log by the inspecting technician. The technician conducting the inspection and providing the certification must not be the vessel's owner, operator, master, or employee or their affiliates. Additionally, the vessel owner, operator, or ship's

master must certify in the station log that the inspection was satisfactory. There are no FCC prior notice requirements for any inspection pursuant to paragraph (a)(1) of this section. An inspection of the bridge-to-bridge radio station on board vessels subject to the Vessel Bridge-to-Bridge Radiotelephone Act must be conducted by the same FCC-licensed technician.

**Note:** The mandatory inspection of U.S. vessels compliant with 47 CFR Part 80 Subpart W (GMDSS) must be conducted by an FCC licensed technician holding an FCC GMDSS Radio Maintainer's License using the latest FCC Information Bulletin, How to Conduct a GMDSS Inspection, which may be obtained at <http://www.fcc.gov>.

## References

- 1974 SOLAS as Amended, Consolidated Edition 2014, Chapters III, IV, & V
- 47 CFR Part 80 Telecommunications
- COMSAR/Circ. 32 Harmonization of GMDSS Requirements for Radio Installations on Board SOLAS Ships
- GMDSS Manual 2015
- IMO GMDSS Master Plan (GMDSS Manual)
- Radio Regulations (GMDSS Manual)
- STCW Code 2010 Amendments
- USCG MOC Policy Letter 04-02 GMDSS Operator Requirements
- USCG MSM Vol II, Section E, Chapter 2. K.
- USCG NVIC 3-99 GMDSS and EPIRB Requirements on Commercial Vessels
- 46 CFR Shipping
- Communication Act of 1934, Title III, Parts II and Part III

## PQS References

### OSV PQS

- OI-CD15 – Review Cargo Ship Radio Certificate and Form R
- OI-CD24 – Review FCC Station License
- OI-LM03 – Review Radio Logs
- OI-BN09 – Inspect GMDSS Equipment
- OI-LS01 – Inspect EPIRB

### TII PQS (T-International)

- TII-CD08.4 – Verify GMDSS Endorsements
- TII-BN07 – Inspect GMDSS Equipment

### PSCE PQS

- PSCE-CD07 - Examine Cargo Ship Radio Certificate and Form R
- PSCE-CD12.5 - Verify GMDSS Operator Certificate is valid
- PSCE-BN12 - Examine GMDSS
- PSCE-LM11.03 - Verify EPIRB Test(s)

## Websites

<b>Navigation Center</b> ➤ <a href="http://www.navcen.uscg.gov/?pageName=gmdssArea">http://www.navcen.uscg.gov/?pageName=gmdssArea</a>
<b>FCC GMDSS Checklist</b> ➤ <a href="https://www.fcc.gov/eb-ship-inspection-checklists">https://www.fcc.gov/eb-ship-inspection-checklists</a>
<b>Rescue 21 (Sea Area A1)</b> ➤ <a href="https://www.navcen.uscg.gov/?pageName=mtNds">https://www.navcen.uscg.gov/?pageName=mtNds</a>
<b>FCC Website regarding GMDSS</b> ➤ <a href="https://www.fcc.gov/bureau-divisions/mobility-division/ship-radio-stations/global-maritime-distress-and-safety-system">https://www.fcc.gov/bureau-divisions/mobility-division/ship-radio-stations/global-maritime-distress-and-safety-system</a>

## Glossary

AIS – Automatic Identification System
AM – Amplitude Modulation
CES – Coast Earth Station
CG – Coast Guard
COMSAR – The Sub-Committee on Radio Communications and Search and Rescue
COSPAS-SARSAT System - Satellite SAR System
DSC – Digital Selective Calling
EGC – Enhanced Group Call
EPIRB – Emergency Position-indicating Radio Beacon
FCC – Federal Communications Commission
FM – Frequency Modulation
FR – Federal Register
GMDSS – Global Maritime Distress and Safety System
GPS – Global Positioning Satellite
HF – High Frequency
IMO – International Maritime Organization
Inmarsat – IMO Recognized Mobile Satellite Service provider
Iridium – IMO Recognized Mobile Satellite Service provider
ITU – International Telecommunication Union
kHz – Kilo Hertz
LES – Land Earth Station
LRIT – Long-Range Identification and Tracking
LUT – Local User Terminal
MCC – Mission Control Center
MF – Medium Frequency
MF/HF Radio – Medium Frequency/High Frequency Radio (SSB Radio)
MHz – Mega Hertz
MID – Maritime Identification Digit
MMSI – Maritime Mobile Service Identity



MODU – Mobile Offshore Drilling Unit
MSI – Marine Safety Information
MSM – Marine Safety Manual
NavArea – Geographical Sea Areas for broadcast navigational warnings
NAVTEX – MF NBDP system used for local MSI
NBDP – Narrow Band Direct Printing
OCS – Outer Continental Shelf
OCS NCOE – Outer Continental Shelf National Center of Expertise
OSV – Offshore Supply Vessel
SafetyNET – Inmarsat system used for MSI for Areas other than A4.
SAR – Search And Rescue
SART – Search and Rescue Transponder
Sea Areas – Areas of Operation for GMDSS
SES – Ship Earth Station
SMC – Safety Management Certificate
SOLAS – International Convention, for Safety Of Life At Sea, 1974, as amended
SSAS – Ship Security Alert System
SSB – Single Sideband Band Modulation
SSB Radio – Single Sideband Band Radio (MF/HF Radio)
STCW – Standards of Training, Certification and Watchkeeping for seafarers
UPS – Uninterrupted (or uninterruptible) Power Supply
USCG's MSC – United States Coast Guard's Marine Safety Center
VHF – Very High Frequency

## **Terms and Definitions**

**406 EPIRB:** Is a satellite position indicating radio beacon that transmit a distress alert in the 406 MHz band to polar orbiting satellites in the Cospas-Sarsat System. EPIRB is a transmit only device and cannot receive signals. The 406 EPIRB must also transmit a homing signal on 121.500 MHz. On units installed after 1 July, 2022, be provide with a GNSS position receiver and capable of transmitting AIS locating signals on dedicated marine VHF frequency bands.

**Automatic Identification System (AIS):** A maritime navigational safety communication system that transmits and receives navigational information, including the vessel's identity, type, position, course, speed and other safety related navigational information to other AIS fitted vessels and coast stations on dedicated marine VHF frequency bands.

**Cospas-Sarsat Systems:** This system utilizes two satellite systems (a polar orbiting and a geo-stationary satellite system) to detect the signal of a 406 EPIRB and transmit the EPIRB's location to the nearest ground station. These ground stations are referred to as Local User Terminals (LUTs).

**Digital Selective Calling:** The IMO introduced digital selective calling (DSC) on VHF, MF and HF maritime radios as part of the GMDSS. DSC is primarily intended

to initiate ship-to-ship, ship-to-shore, and shore-to-ship radiotelephone communications on VHF, MF/HF and radio-telex communications on MF/HF.

DSC calls can also be made to individual ships or groups of ships. DSC distress alerts, which consist of a preformatted distress message, are used initiate emergency communications with ships and rescue coordination centers.

DSC was intended to eliminate the need for persons on a ship's bridge or on shore to continuously guard radio receivers on voice radio channels, including VHF CH 16 (156.8 MHz) and 2182 kHz now used for distress, safety and calling.

**Note:** The requirement for a listening watch aboard GMDSS-equipped ships on 2182 kHz expired on 1 February 1999. The requirement for a listen watch on VHF CH 16 has not expired.

### **GMDSS Sea Areas:**

- **Sea Area A1:** An area within the radiotelephone coverage of at least one VHF coast station in which continuous digital selective calling (CH 70) alerting and radiotelephony services are available, as defined by the IMO.
- **Sea Area A2:** An area, excluding Sea Area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC (2187.5 kHz) alerting and radiotelephony services are available, as defined by the IMO.
- **Sea Area A3:** An area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geo-stationary satellite in which continuous alerting is available.
- **Sea Area A4:** The area outside that covered by areas A1, A2 and A3 is called Sea Area A4 Area (Polar Regions).
- **Note:** Currently the United States presently has no declared A2 Sea Areas.

**High Frequency (HF):** The HF band ranges from 3 MHz to 30 MHz. The frequencies commonly used for marine radios are frequencies in the 4, 6, 8, 12, and 16 MHz band. HF provides long range communication services generally > 200 miles.

**HF Installations:** Marine HF equipment able to transmit and receive emergency and general two way radiotelephony and narrow-band direct-printing communications on appropriate frequencies between 4000-27.500 KHz. HF Installations are also capable of maintaining a DSC watch and can send alerts on 8414.5 kHz and at least one other HF distress and safety frequencies 4207.5 kHz 6312 kHz, 12577 kHz or 16804.5 kHz. This DSC equipment may be separate from or combined with the MF/HF equipment.

**INMARSAT Systems:** INMARSAT is a private commercial company licensed in the UK that utilizes geostationary satellites and Land Earth Stations (LES) globally for marine communication services. Ships fitted with INMARSAT Ship Earth Station (SES) system are capable of distress alerting and for two-way communications using e-mails, fax, data transmission and/or radiotelephone.

**Medium Frequency (MF):** The MF band ranges from 300 kHz to 3 MHz. The common frequencies used for marine radios are frequencies in the 2 MHz band. MF provides mid-range communication services generally < 200 miles.

**MF Installations:** Marine MF equipment able to transmit and receive emergency and general two way radiotelephony and narrow-band direct-printing communications on appropriate frequencies between 1605-4000 KHz. Also, able to maintain DSC watch

and alert on 2187.5 kHz which may be separate from or combined with the MF equipment.

**MF/HF Installations:** Marine MF/HF equipment able to transmit and receive emergency and general two way radiotelephony and narrow-band direct-printing communications on appropriate frequencies between 1605-4000 kHz and between 4000-27.500 KHz. MF/HF Installations are also capable of maintaining a DSC watch and alerting on 2187.5 kHz, 8414.5 kHz and at least one other HF distress and safety frequencies 4207.5 kHz 6312 kHz, 12577 kHz or 16804.5 kHz. This DSC equipment may be separate from or combined with the MF/HF equipment.

**MMSI:** A nine digit Station Identification number assigned to ships and coast stations. On ships, the first three digits which is the MID identifies the Administration that issued the MMSI. For Coast Stations, the MID will follow the two zeros (00MID). Note: this is the same station identity number used for AIS systems.

**NAVTEX:** A dedicated MF receiver that receives local MSI on 518 kHz band.

**Passenger Ship:** A U.S. flagged vessel > 100GT carrying more than 12 passengers, or a foreign flag vessel any tonnage carrying more than 12 passengers.

**SART:** Search and Rescue Transponders

- **RADAR SART:** A search and rescue transponder that transmits a series of response signals after being interrogated by a 9 GHz radar that can be received by any ordinary 9 GHz shipborne radar or suitable airborne radar..
- **AIS SART:** A search and rescue transponder that transmits a locating signal to a searching vessel or aircraft's AIS system. AIS SARTs became approved for GMDSS effective January 1, 2010.

**Satellite Communication Systems:** Are systems that utilizes satellites and land stations for marine communications. The two primary satellite systems used in GMDSS are the INMARSAT and Cospas-Sarsat systems.

**SSB Marine Radio:** A marine MF/HF transceiver that uses SSB modulation to transmit and receive two way communication on MF/HF radiotelephony, DSC and Telex frequencies.

**Survival Craft Radiotelephones:** Emergency VHF transceivers that operate on VHF CH 16 and one other channel (CH 06 is recommended by IMO) for the purpose of use in survival crafts during an emergency situation.

**Terrestrial Communication Systems:** Are systems that utilizes a variety of HF, MF and VHF marine radio frequencies to transmit and receive long range, mid-range and short range communications.

**Very High Frequency (VHF):** The VHF band ranges from 30 MHz to 300 MHz. The frequency range for marine radios are in the 156-174 MHz band. VHF is utilized to provide short range communication services, generally about 25 miles or more.

**VHF Installations:** A FM marine transceiver capable of providing radiotelephony (voice) communications on VHF channels and DSC monitoring and alerting capabilities on VHF CH 70.