

## **U.S. NATIONAL IMPLEMENTATION TASK FORCE GMDSS INFORMATION BULLETIN**

### **SMALL COMMERCIAL VESSELS LESS THAN 300 TONS**

#### **Scope of this Information Bulletin**

This information bulletin provides a brief overview of the Global Maritime Distress and Safety System (GMDSS) mandated by the Safety of Life at Sea (SOLAS) Treaty which applies to cargo vessels over 300 tons and to passenger vessels carrying more than 12 passengers. The bulletin will also summarize the effect of GMDSS on smaller commercial vessels (non-SOLAS vessels).

#### **Mandatory Safety Radio Equipment on Commercial Vessels**

Small United States commercial vessels including passenger vessels carrying less than 12 passengers, cargo ships, tow boats and fishing vessels less than 300 gross tons are not required to carry radio equipment necessary to comply with the GMDSS. Such vessels may, however, be subject to other laws including the Bridge-to-Bridge Act, the Communications Act or Coast Guard and FCC regulations, which mandate carriage of radio equipment for safety purposes. GMDSS was fully implemented by SOLAS vessels on February 1, 1999, but the supporting coastal radio networks have not yet been fully upgraded in the U.S. It is important for safety that SOLAS vessels and non-SOLAS vessels are able to intercommunicate. Recent changes to Part 80 of the FCC Rules require small commercial vessels mandatorily equipped with radio to upgrade VHF and MF radio systems to DSC within a year after the Coast Guard declares Sea Areas A1 (VHF-DSC coverage from shore) and A2 (MF-DSC coverage from shore) operational, so as to be compatible with those of SOLAS Vessels and with the Coast Guard's upgraded shore networks.

#### **GMDSS Background**

Since 1 February 1999, SOLAS vessels have used new highly reliable communications technology for distress alerting. GMDSS automates systems that previously required continuous live listening watches, and generally improves the reliability and effectiveness of the distress and safety system. One feature of the GMDSS replaces the traditional voice calling method of establishing communications with an automated method called Digital Selective Calling (DSC), applicable to Medium Frequency (MF), High Frequency (HF), and Very High Frequency (VHF) radios. Other GMDSS systems include Inmarsat satellite systems, Emergency Position Indicating Radio Beacons (EPIRBs), Search and Rescue Transponders (SARTs), and Navtex and SafetyNET broadcast systems for disseminating Marine Safety Information (MSI). Training and licensing are also mandated for operators on SOLAS vessels.

#### **Digital Selective Calling (DSC)**

DSC uses digital radio techniques to send distress calls to establish routine communications between ships, ship to shore and shore to ship. Once contact has been established on the digital calling channel, communications continue on normal analog channels by voice. All DSC systems require a unique identifier, the Maritime Mobile Service Identity (MMSI), assigned by national authorities. Distress calls in all DSC systems (except the EPIRB which uses its factory serial number) transmit the MMSI number. The FCC Rules, since withdrawn, permitted voluntary vessels to use VHF-DSC radios built to the RTCM SC-101 minimum standard. The GMDSS Task Force notes that the SC-101 VHF radio can send distress alerts adequately but has very few practical features for other communication functions. The Task Force therefore recommends the International Class 'D' VHF-DSC standard as more suitable for general use.

#### **VHF-DSC**

SOLAS ships guard channel 70 for VHF-DSC distress and calling but are also required to maintain a continuous watch on channel 16 for an indefinite period to enable interoperability with non-SOLAS vessels. The Coast Guard will maintain the channel 16 watch ashore indefinitely to support those vessels not required to upgrade to DSC. The Coast Guard expects to complete upgrade of the coastal VHF watch

to VHF-DSC by about 2011 along the coasts of the continental U.S. It must be emphasized that this new DSC lifesaving technology cannot function unless the owner registers for an MMSI (see MMSI paragraph below), embeds the MMSI in the radio, and connects a navigation receiver. It is also important that operators become familiar with DSC operation. See the excellent DSC tutorial on the BOATUS website, [www.boatus.com/mmsi](http://www.boatus.com/mmsi).

## **MF-DSC**

SOLAS ships also watch the MF-DSC distress and calling channel, 2187.5 kHz, but international rules no longer require them to watch 2182 kHz. The FCC, however, continues to require a 2182 watch by U.S. vessels. The Coast Guard has announced plans to maintain the guard on 2182 kHz ashore indefinitely but its plans to upgrading the coastal watch for MF-DSC are currently on hold pending further study. MF operations are typically in a simplex (single frequency) mode.

## **HF-DSC**

SOLAS ships electing the HF option for long-range communications also watch 8414.5 kHz and one other DSC distress channel in the HF bands. The Coast Guard watches the DSC distress and calling channels in all of the HF frequency bands and this service has been available for several years. The Coast Guard also watches selected voice frequency channels in the HF bands for calls from shipping. For more details refer to the Coast Guard maritime communications website at [www.navcen.uscg.gov/marcomms](http://www.navcen.uscg.gov/marcomms).

## **Maritime Mobile Service Identity (MMSI) Numbers**

The DSC calling identity is the nine digit Maritime Mobile Service Identity (MMSI) that is assigned by the FCC to vessels desiring or required to use DSC in the VHF, MF, and HF maritime radio bands. The MMSI number must be embedded in the DSC equipment. The way to get an MMSI number assigned is to apply to the FCC for upgrade of an existing radio station license. If a station license is not required for your vessel because you use VHF only, you can apply to one of the authorized organizations that have been permitted by the FCC to make MMSI assignments. These organizations can make MMSI assignments on line or by calling the toll free number and there is no fee for the service:

BoatU.S	<a href="http://www.boatus.com">www.boatus.com</a>	1-800-395-2628
Sea Tow	<a href="http://www.seatow.com">www.seatow.com</a>	1-800-4-SEATOW
U.S. Power Squadrons	<a href="http://www.usps.org/php/mmsi/">www.usps.org/php/mmsi/</a>	

## **Satellite Communications**

SOLAS vessels may use either Inmarsat Ship Earth Stations (SES) or HF-DSC as their primary long-range communications system. The Inmarsat B, C, Mini-C and the new Fleet 77 systems are GMDSS qualified. The Inmarsat M, Mini-M, Fleet 33, and Fleet 55 SES are not approved for GMDSS. Non-SOLAS commercial vessels are not required to use long-range systems unless they operate on the high seas.

## **Satellite EPIRBs and SARTs**

Satellite Emergency Position Indicating Radio Beacons (EPIRBs) used for distress alerting and locating are required on SOLAS vessels and highly recommended for other vessels that operate offshore. SOLAS vessel satellite EPIRBs are rigged to float free and self activate in the event of a sudden sinking. Simplified EPIRBs known as Personal Locator Beacons operating on 406 MHz are also available and may be used by vessels not subject to GMDSS. All EPIRBs approved for use on U.S. vessels must also have a 121.5 MHz local homing signal. Search and Rescue Transponders (SARTs) are also required on SOLAS vessels. SARTs are used for close in location of survivors and stowage in the survival craft is recommended,

## **Watchkeeping on Marine Radios**

All vessels over 20 meters are required to stand watch for voice calls on VHF channel 13 or 67, the Bridge to Bridge safety channels which are restricted to low power safety of navigation communications, when operating within the 12 mile limit. New FCC Rule changes require that all users of marine radios, including voluntary users, keep the radio turned on and watching the appropriate emergency channel at all times when underway and not working on another channel. In the case of regular VHF, the watch is maintained on channel 16, for VHF-DSC equipped vessels, the watch is maintained on channel 70. For MF Radios the watch is maintained on 2182 kHz and for MF-DSC radios on 2187.5 kHz. There are similar requirements that voluntary vessels with HF-DSC radios and Inmarsat Satellite terminals cruise with the radios turned on and watching the emergency channels. The recent Rules changes also require that all compulsory vessels with a GPS or Loran receiver connect it to DSC and Inmarsat equipment so that an accurate position will automatically be sent with distress calls. The Task Force strongly recommends that voluntary vessels also connect a navigation receiver to their GMDSS alerting systems.

## **Maritime Safety Information (MSI) Broadcast Systems**

MSI includes distress alerts seeking assistance for vessels in distress, urgent warnings affecting safety of navigation, and weather warnings and forecasts. The coastal Navtex system broadcasts on 518 kHz to a coverage zone about 200 miles offshore. Navtex MSI notices are broadcast to the coastal areas affected by the subject matter. Small commercial vessels may wish to use one of the new paperless Navtex receivers. The high seas SafetyNET system broadcasts MSI via the Inmarsat C system with Enhanced Group Calling (EGC) capability. SafetyNET MSI notices are directed to one of 16 global Nav/Met areas. Both Navtex and SafetyNET receivers have processors which block printing of MSI messages already received. The coastal NOAA Weather Radio is not a GMDSS system but is a valuable VHF continuous voice broadcast along the coasts of the U.S. At the present time, reception of MSI broadcasts is a GMDSS requirement but is optional for non-SOLAS vessels. All prudent mariners should monitor MSI broadcasts, however.

## **Training, Licensing and Certification**

The Master and all Mates on SOLAS vessels are now required to hold the FCC GMDSS Radio Operator's License (GOC) for Sea Areas A2, A3 (Inmarsat coverage), and A4 (polar regions) or the Restricted GMDSS Radio Operator's License (ROC) for operations in Sea Area A1. They must also hold a Coast Guard STCW 95 GMDSS endorsement. The STCW endorsement requires mandatory training and demonstrated ability to operate all GMDSS systems. Most small commercial vessels are not required to be STCW compliant, however, and are permitted to use any GMDSS equipment without mandated GMDSS training. Small commercial vessels mandated to carry radio for safety reasons are required to hold a radio station license and the appropriate operator permits. Vessels subject to the Bridge-to-Bridge act are also required to hold a radio station license.

## **The GMDSS Task Force**

This Information Bulletin was approved on 8 October 1996 and updated on 16 May 2002 and 6 August 2009 by the National GMDSS Implementation Task Force, a U.S. Coast Guard sponsored group established to resolve implementation problems and assist in disseminating GMDSS information. The Task Force is soliciting feedback on problems encountered and invites responses from all concerned. Address responses to Captain Jack Fuechsel, Task Force Executive Director 1600 North Oak Street, #427, Arlington VA 22209; phone 703-527-0484; or email [gmdss@comcast.net](mailto:gmdss@comcast.net). See also the Task Force GMDSS web site at [www.navcen.uscg.gov/marcomms](http://www.navcen.uscg.gov/marcomms) (Click on GMDSS, then on GMDSS Task Force). Reproduction and wide distribution of this document is encouraged.