7 August 2003

U.S. NATIONAL IMPLEMENTATION TASK FORCE GMDSS INFORMATION BULLETIN

SAFETY OF FISHING VESSELS IN THE VESSEL MONITORING SYSTEM (VMS)

Background

The National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA) has established a Vessel Monitoring System (VMS) to track vessels, which have been authorized to participate in selected fisheries. These fisheries are managed by the Regional Fishery Management Councils that prescribe the equipment and procedures for complying with VMS requirements. NMFS has been specifying tracking systems to support law enforcement programs aimed at conserving marine resources and countering violations by fishing vessels. The tracking systems have been selected to take advantage of available technology, automate the process to the extent feasible, ensure privacy, and minimize cost to participating fishing vessels. While initial VMS requirements have been limited to vessel tracking, there is obvious management and safety benefit to specifying that vessels have a two-way communications capability. Future developments may require vessels to report fish catch or other data.

Satellite Based Monitoring Systems

Since most of the fisheries selected for VMS tracking lie well offshore, satellite based tracking systems have been selected as offering the desired capabilities of automation and privacy. The Inmarsat system utilizing various configurations of the Inmarsat-C service has been designated as one of the primary options but the Argos and Boatracs systems are also permitted in selected fisheries and an Orbcomm proposal has been made. The NMFS has had instances of spoofing by participating fishing vessels and in some cases has restricted vessel terminals to those with integral GPS, which do not accept external position input. In some cases NMFS has also mandated special software modifications for use in the VMS.

The Argos transponders are carried on polar orbiting environmental satellites and track emissions from the vessel at prescribed intervals, deriving positions from GPS receivers. There is a limited capacity for reporting additional parameters such as catch data. There is a capability to send ship to shore emergency alerts and the data center is manned 24x7. The system is not configured for two-way communications but future developments could add that capability. Argos terminals are not GMDSS qualified.

The Boatracs system is a maritime version of a land-based vehicle tracking system using geostationary satellites. Boatracs units are not GMDSS qualified but have a two-way messaging capability for email type data communications. There is a 24x7 manned data center and it is possible to send a shore to ship ‘priority’ message, which will sound an alarm on the vessel if the appropriate add-ons have been installed on the Boatracs transceiver. An optional ‘panic button’ is available for the vessel terminal that enables the vessel to quickly originate a ship to shore emergency message creating an audible alarm at the data center which will then notify the Coast Guard.

The Inmarsat-C system is a component of the GMDSS when configured according to rules of the International Maritime Organization (IMO) to meet Safety of Life at Sea (SOLAS) specifications. Inmarsat-C is a data only system that supports text messaging and compressed data reports. Position reports are derived from a connected or integral navigation receiver. SOLAS configurations include a distress button for emergency use, priority handling of distress and safety messages, audible alarms on the vessel, and an Enhanced Group Calling (EGC) feature enabling reception of the SafetyNET Marine Information Broadcasts. In this Bulletin, the term “GMDSS qualified” means that all SOLAS specifications have been met. The following Inmarsat-C terminals have been authorized or are under consideration for selected fisheries:

a. TT-3022D-NMFS - GMDSS qualified with integral GPS. Has a distress button and can handle two way communications if a messaging unit is provided (not required for VMS operations but required for GMDSS use). NMFS software modification required.

b. Trimble Galaxy TNL-7005 with software v5.1 with integral GPS. This unit is factory preconfigured for NMFS VMS non-GMDSS operations. The Trimble units are no longer being manufactured but may be available from some dealers.

c. Trimble Galaxy TNL-8005 with software v5.1. This unit is similar to the 7005 except that it has an integral messaging unit and is GMDSS qualified.

d. TT-3026-M, a mini-C terminal that is under consideration. It is not GMDSS qualified and only has two-way communications capability if an optional messaging unit (laptop or etc) is added.

e. TT-3026-S, a mini-C terminal similar to the 3026-M except that it has EGC capability for reception of SafetyNET broadcasts. Two-way communication is available if a messaging unit is added, (required for GMDSS qualification).

The Orbcomm system has also been proposed for VMS applications but has not yet been accepted. The system operates in the VHF band through 30 Low Earth Orbit (LEO) satellites with generally adequate coverage of most fishing grounds. Orbcomm terminals are not GMDSS qualified but two-way data communications are available in an email format. The data centers are manned 24x7and can relay messages to a pre-set notification list including the regional Rescue Coordination Center (RCC).

Radio Safety Equipment Prescribed for Fishing Vessels

Fishing vessels are engaged in a dangerous occupation, often in rough weather and because of their relatively small size have come to be regarded as generating proportionally more search and rescue missions than other segments of the maritime community. Despite this, U.S. fishing vessels have been minimally regulated for radio safety equipment, perhaps due to political intervention aimed at minimizing the expense of compliance. The Coast Guard has expressed concern that NMFS VMS regulations have accepted non-GMDSS satellite systems with non-standard or one-way messaging capabilities and versions of Inmarsat-C in which a messaging unit is optional. The Inmarsat-C transceiver can provide the position reporting function either automatically or when polled but without a laptop or other messaging facility, the unit cannot send or receive messages. NMFS has made it clear that while they recognize the safety benefit of a two-way communications capability, their mandate has been limited to Law Enforcement requirements.

Incentives for Fishing Vessels to Equip for Two Way Communications

Fishing Vessel crews are interested in sending and receiving personal messages to family and friends ashore and may voluntarily augment required communications systems with the necessary equipment to send and receive email through internet connections. This becomes especially important now that “marine Operator” commercial services are rarely available. U.S. vessels can also generally route email messages to the Coast Guard RCCs via the Internet although this may not be generally true on a global basis. The NMFS may elect to require a two-way communication capability in the future to facilitate catch reporting and other management functions. Similarly, the Coast Guard may require a two-way communications capability to support a future requirement for long range tracking of fishing vessels for homeland security purposes. If federal authorities do not mandate such a capability, insurance companies and non-regulatory bodies such as the GMDSS Task Force should provide incentives for voluntary fitting. If cost is a factor, most fishing vessel owners might at least opt for a system providing email capability if they understand the safety benefits. Ideally, a safety conscious vessel owner will specify a GMDSS qualified system.

The Coast Guard safety concern

The GMDSS is an integrated system in which all vessels derive a collective safety enhancement through participating in a common system. When selected vessels in the fleet lack some of the GMDSS features, not only is their safety posture reduced, but the safety of other vessels is also reduced since those without full features cannot readily be alerted to assist another vessel nearby. The Coast Guard safety concern with the VMS equipment options which do not include a two way communications capability is as follows:

a. A high percentage of distress alerts received from Inmarsat-C equipped vessels are false. For this reason Coast Guard doctrine includes sending a message to the vessel to verify the validity of the alert. A fishing vessel without a messaging terminal will not know that he has been sent a message but the terminal will acknowledge receipt of the message as though a messaging terminal was available. In the same fashion, an EPIRB alert from a fishing vessel may also need to be validated via a two-way communication system. The IMO Subcommittee on Communications, Search and Rescue (COMSAR) addressed this problem at its 3rd session and stated "the Subcommittee strongly urges that Inmarsat no longer allow terminals without a full user interface and with Distress Facilities to be used for data acquisition." (Now that Inmarsat is a private Corporation, this recommendation should also be directed to administrations).

b. The Coast Guard often finds it necessary to contact other vessels to assist a vessel in difficulty. Vessels in the vicinity can usually be alerted through a priority SafetyNET broadcast which sounds an audible alert on the vessels. Alternatively, a vessel known to be in the vicinity can be addressed individually. Fishing vessels without a messaging capability cannot be alerted by either means, however. Vessels that optionally fit a messaging unit for email etc. can send requests to the Coast Guard for assistance and can receive email messages sent by the Coast Guard. These informal messaging channels may not produce an audible alert on the vessel, however, and several hours can elapse before the vessel routinely checks its email.

c. Using non-GMDSS Inmarsat-C terminals would presumably minimize the false alert problem since those terminals do not have a distress button. This is a dubious improvement however, since a non-GMDSS terminal inherently provides fewer safety features than a GMDSS terminal. If such a terminal has a two way messaging capability, however, it would contribute to safety since a fishing vessel could request Coast Guard assistance via an email message and receive email messages from the Coast Guard.

d. While the availability of a non-GMDSS messaging system can be of assistance, it is not as good as a GMDSS compliant communication system since messages from the ship are passed through non-priority channels and arrive at the Coast Guard Rescue Coordination Center (RCC) as an email message. Much longer turn around times are typically associated with these messaging systems. Similarly, the RCC, if trying to contact a vessel without a GMDSS system is not able to use the readily available SafetyNET priority broadcast channel which sounds an alert on the ship and must resort to researching available data bases to determine whether the vessel has a two-way messaging capability and, if so, how to address the message. Note that the concern relative to two-way communications is heightened if the Coast Guard required MF/HF Radiotelephone has been waived because the vessel fitted a satellite system.

e. A further Coast Guard concern regarding non-GMDSS messaging terminals is the size of the storage buffer for incoming messages. In the event that the vessel operator does not check for new messages periodically, the buffer could fill up and some older unread messages could be lost. There have also been reports that some GMDSS qualified Inmarsat-C terminals may fail to store incoming messages properly if the printer has been turned off, this reportedly included failure to store messages on the floppy disc and delete older messages when the disc is full.

FCC Mandated GMDSS Equipment for Fishing Vessels over 300 Tons

The Federal Communications Commission (FCC) is the regulatory agency responsible for radio safety regulations for fishing vessels over 300 tons. The FCC Rules do not recognize fishing vessels as a special category and treat them the same as cargo vessels of the same size. The FCC Rules require full GMDSS capability for fishing vessels over 300 tons. This includes a SOLAS qualified Inmarsat-C terminal and

numerous other safety radio equipments. An FCC Station License is required for all vessels mandatorily equipped with radio including those below 300 tons. GMDSS radio operator licenses are also required for those fishing vessels required to be GMDSS equipped.

Coast Guard Mandated Radio Safety Equipment

The Coast Guard regulates safety radio equipment on vessels under 300 tons in accordance with 46CFR28. The complex carriage regulations can be summarized as requiring the following equipment:

Emergency Position Indicating Radio Beacon (EPIRB) per 46CFR25
VHF Radiotelephone for all fishing vessels in all areas (DSC is not specified)
MF Radiotelephone if operating over 20 miles from the coast (DSC not specified)
MF/HF Radiotelephone if operating more than 100 miles from the coast or in any Alaskan waters
A Satellite system covering the operating area can substitute for MF and HF (this exception implies a two-way communications capability but it is not stated specifically)
A cell phone can substitute for MF and HF if the cellular system covers the operating area
All required communication systems must have emergency power available

New Regulatory Action to Comply with Homeland Security Requirements

The Coast Guard published new regulations on 1 July 2003 to implement new homeland security procedures required by the Transportation Security Act. These include short range tracking of vessels with a VHF Automatic Identification System (AIS). Fishing vessels are not exempted in the 1 July regulations so those over 65 feet in length are required to fit the short range AIS system by 31 December 2004. Another homeland security goal to be implemented later will include a long range tracking system utilizing Inmarsat-C and perhaps other VMS system techniques. It is not yet clear what size fishing vessels may be required to participate in long range tracking but it seems likely that the tracking system would be accompanied by a requirement for two-way communications capability in order to effectively manage the program. The GMDSS Task Force urges that these new Coast Guard requirements be developed in conjunction with the NMFS requirements to minimize impact on fishing vessels.

Coast Guard Recommended Supplemental Radio Safety Equipment

The Coast Guard strongly recommends that all fishing vessels equipping for participation in a NMFS mandated VMS fishery, procure terminals with a messaging capability to enable two way communications. If a GMDSS qualified terminal is one of the options permitted, the Coast Guard strongly endorses that as a preferred option for vessel safety. The GMDSS Task Force also endorses these recommendations and has agreed to help publicize them throughout the fishing community.

The GMDSS Task Force

The National GMDSS Implementation Task Force approved this Information Bulletin on 7 August 2003, the Task Force is a Coast Guard sponsored group established to resolve implementation problems and disseminate GMDSS information. The Task Force is soliciting feedback on problems encountered and invites 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. See also the Coast Guard GMDSS Internet web site: www.navcen.uscg.gov/marcomms (select GMDSS, then GMDSS Task Force). Duplication and reprinting of this Bulletin is authorized in order to reach the widest possible audience.

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