Possible Interoperability Solutions for GMDSS Recognized Mobile Satellite Service Providers

Submitted by WWNWS-SC Interoperability Correspondence Group

SUMMARY

Executive Summary: With two IMO GMDSS Recognized mobile satellite service (RMSS) providers, and the potential for that list to grow, the WWNWS should actively facilitate discussions to develop a solution for how NAVAREA Coordinators can broadcast navigational warnings when there are multiple RMSS providers. This paper proposes four potential solutions.

Action to be taken: Paragraph 5

Related documents: NCSR 5/23 – Report to the Maritime Safety Committee, MSC99/WP.1-- Draft Report Of The Maritime Safety Committee On Its Ninety-Ninth Session, NCSR 5/9 -- Outcome of the ninth session of the IHO World-Wide Navigational Warning Service Sub-Committee, NCSR 5/14/2 -- Recognition of Iridium mobile satellite system as GMDSS service provider.

1. Background

At its ninth meeting, the WWNWS-SC agreed to establish a new correspondence group to identify how to best define interoperability when there are multiple GMDSS Recognized Mobile Satellite Service (RMSS) providers; paragraph 3.5.2 from the WWNWS9 summary report refers. Eleven countries agreed to participate: New Zealand, Canada, South Africa, Argentina, Norway, Australia, Sweden, Spain, France, Japan, United States (CG Lead).

In document NCSR 5/23--Report to the Maritime Safety Committee, paragraph 14.55, "the Sub-Committee invited the Committee to note the discussion, as set out in paragraphs 14.26 to 14.54, and provide guidance to the Sub-Committee on the way forward. In this context, the Sub-Committee invited Member States and international organizations to submit proposals on this matter to the Committee, as appropriate."

At MSC99 the Committee recognized Iridium as a GMDSS mobile satellite system. Document MSC 99/WP.1-- Draft Report of The Maritime Safety Committee on its Ninety-Ninth Session, paragraph 12.21, references its decision.

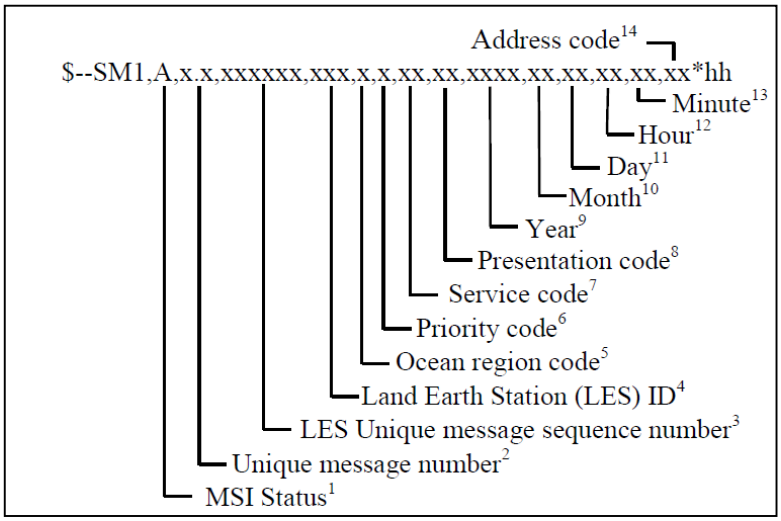
2. Interoperability

Interoperability describes the extent to which systems and devices can exchange data and interpret that shared data. For two systems to be interoperable, they must be able to exchange data and subsequently present that data in a way that the user can understand. To exchange data there must be a common data structure that all participants agree to use. For the WWNWS, that data structure is currently National Marine Electronics Association (NMEA) standard 0183 and, eventually, will be S-124. As of this writing, all NAVAREA Coordinators do not use the same software or process to create Enhanced Group Call (EGC) messages. The end product might be the same, but the path to achieve that end may need to change to achieve interoperability. This paper proposes potential interoperability solutions based on the current standard, NMEA 0183.

The NMEA 0183 interface standard defines electrical signal requirements, data transmission protocol and time, and specific sentence formats for a 4800-baud serial data bus. Baud is a unit of transmission speed equal to the number of times a signal changes state per second; one baud is equivalent to one bit per second. This data is in printable ASCII form and may include information such as position, speed, depth, frequency allocation, etc. Inmarsat C transceivers adhere to NMEA 0183. The standard dates to 1992 and NMEA has updated it eight times since then.

There are five sentences (SM) in NMEA 0183 that govern the transmission of navigational warnings over Inmarsat C:

SM1 – SafetyNet Message, All Ships/NavArea
SM2 – SafetyNet Message, Coastal Warning Area
SM3 – SafetyNet Message, Circular Area Address
SM4 – SafetyNet Message, Rectangular Area Address
SMB – IMO SafetyNet Message Body (NMEA added this sentence to the standard in 2013. However, no receivers are currently capable of reading it)



3. Four Potential Interoperability Solutions

1. NAVAREA Coordinators provide navigational warnings to a single Recognized mobile satellite service (RMSS) provider and that provider forwards to all additional RMSS providers.

2. NAVAREA Coordinators provide navigational warnings to all RMSS providers simultaneously, via email or another agreed method.

    a. Concerns:

        i. What is the format of the message? txt file, EGC file, or some other alternative?
        ii. Which format does the NMEA 0183 sentence structure successfully attach, if any?
        iii. Could a NAVAREA Coordinator simply forward a transmitted EGC message—the monitored message received—to another provider for broadcast?
        iv. Could the NAVAREA Coordinator forward a txt file to all RMSS providers and they would properly encode and transmit the EGC message using NMEA 0183?

3. Provide navigational warnings to a centralized location that automatically pushes to all RMSS providers.

    a. Similar concerns for solution 2.
    b. Who maintains this centralized location and at what cost to NAVAREA Coordinators?

4. Could each NAVAREA Coordinator establish a watch folder—an externally monitored folder by all RMSS providers? RMSS providers would monitor that folder and recognize automatically the existence of new EGC files to transmit as soon as the NAVAREA Coordinator populates the folder. This option might be the most difficult to implement.

4. Concern - Monitoring

How does a NAVAREA Coordinator validate a successful transmission with uncompromised data from multiple RMSS providers? Does the validation process change? Could an email confirmation from a RMSS provider suffice?

Should a RMSS provider notify NAVAREA Coordinators when a navigational warning fails to transmit successfully?

Could each RMDSS provider have a website that geographically displays EGC messages in real time? As soon as the message appeared on the geographic representation, that would serve as confirmation of successful transmission.

How do other critical maritime services monitor their dissemination, if required? RCC's for example?

5. Actions requested

The Sub-Committee is invited to note the report.