POLE STAR
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LRIT AND INMARSAT D+

Current Inmarsat D+ systems are not suitable for LRIT.

Overview

All Inmarsat D+ based products and systems currently available fail to comply with the requirements of the LRIT system, the LRIT performance standards and the LRIT technical specifications.

1) Performance standards: all currently available shipboard hardware (terminals) based on D+ technology do not conform to the LRIT performance standard and will fail a LRIT Conformance Test.

2) Technical specification: all currently available shipboard hardware (terminals) based on D+ technology do not conform to the LRIT technical specification and will fail a LRIT Conformance Test.

3) System functional requirements (security): the use of third party service providers, i.e. D+ resellers is explicitly forbidden by the LRIT regulation.

4) System functional requirements (administration): the D+ network is a 'closed system' and the network operators can not provide automatic terminal activation to LRIT ASPs. Remote automatic terminal activation is a requirement of LRIT ASP operation and the lack of this functionality makes the D+ network unsuitable for use as a component of the LRIT system.

Technical summary

MSC.1/Circ. 1257 – Test 5b:

Performance Standard: 4.2 (Table 1) - Date and time – the equipment should be capable of transmitting the **date and time associated with the GNSS position with each transmission of LRIT information**, and the time should be **in UTC**.

LRIT Conformance Testing requirement - The acceptance criteria is stated as: Confirmed by the ASP recognized by the Administration or approved to conduct conformance testing based upon the confirmed inclusion of MEM code 11 (in the case of Inmarsat-C) and in the case of alternate hardware the compliance of the received message structure with the **equipment manufacturers published standard for a message containing the generated Date and Time stamp.** No tolerances are allowed.

Current Inmarsat D+ packet sizes are too small to transmit UTC. To overcome this limitation a partial date / time is transmitted instead based upon seconds after midnight rather than UTC (or no data / time is transmitted) – this is non-conformant. A practical example of the problem is that a 23.45 position report with a delayed transmission occurring just after midnight would be incorrectly interpreted as occurring 24 hours later.

MSC.1/Circ. 1257 – Test 5c:

Technical Specifications: 2.2.2.6, Technical Specifications: Table 2 - The parameters provided by the equipment include: the latitude; longitude; **Time Stamp when the position was generated …**

The LRIT Conformance Test acceptance criteria is stated as: Confirmed by the ASP recognized by the Administration or approved to conduct conformance testing based upon the confirmed inclusion of MEM code 11 (in the case of Inmarsat-C) and in the case of alternate hardware the compliance of the received message structure with the equipment manufacturer's published standard for a message containing the generated Date and Time stamp. No tolerances are allowed.

Current Inmarsat D+ packet sizes are too small to transmit UTC. To overcome this limitation no date / time is transmitted and the Land Earth Station (LES) time stamp is sometimes used instead – this is non-conformant; further, a significant time-delay could be introduced between the transmission from the terminal and onward transmission from the LES.

MSC.1/Circ. 1257 – Test 13:

Performance Standard: 4.4 - The equipment should be set to automatically transmit the ship's LRIT information at 6-hour intervals to the **LRIT Data Centre identified by the Administration …**

Performance Standard: 5.3.1 - An ASP function should, inter alia, provide a communication protocol interface **between the Communication Service Providers and the LRIT Data Centre …**

Performance Standard: 5.3.1 - An ASP function should, inter alia, ensure that LRIT information is collected, **stored and routed in a reliable and secure manner …**

LRIT Conformance Testing requirement - The acceptance criteria is stated as: Confirmed by the ASP recognized by the Administration or approved to conduct conformance testing based upon confirmation that **all communication links from the terminal – satellite – CSP – ASP are direct and secure with no third party ASP involvement.** No tolerances are allowed.

If any 3rd party is involved in the data transmission chain the system is non-conformant.

Practical operational requirements (administration):

The D+ networks are 'closed systems' and the two commercial network operators can not provide automatic terminal activation. Remote automatic terminal activation is a requirement of LRIT Data Centre ASPs and the lack of this facility makes the D+ system impractical for use as a component of the LRIT system.

Unlike the Inmarsat C terminal activation procedures provided by the primary Land Earth Stations, neither of the two commercial Inmarsat D+ network operators can provide automatic multi-user terminal activation. The practical impact of this limitation is that to integrate a D+ terminal into a LRIT Data Centre will require a lengthy, costly and impractical manual process between various Data Centre ASPs and the different D+ network operators.

Future developments

Other hardware and communication systems will be developed for LRIT reporting in the future. Pole Star is investigating low earth orbit satellite systems (an LRIT solution for Sea Area A4); VHF; AIS; MF, HF, utilizing Fleet Broadband and Isat M2M technology, amongst others.

However, because LRIT equipment must be able to be remotely controlled and programmed by the Flag's LRIT ASP, the system used must be an 'open system', and there must be no 3rd party controlling the LRIT programming of the shipboard equipment other than the LRIT ASP. None of these alternative technologies and networks currently meet LRIT requirements.

Note: Pole Star currently tracks over 12,000 ocean going vessels using a variety of satellite communication systems. This includes more than 5,000 vessels fitted with all makes of Inmarsat D+ terminals. We understand the features and constraints of all the different hardware and satellite systems and networks better than anybody and we use the right equipment and the most appropriate network and system for each application, whether that be telematics, tracking, Ship Security Alert Systems or LRIT. We are currently working with all the major marine satellite terminal manufacturers to develop LRIT-compliant terminals and systems.

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