Paper for Consideration by HSSC16

Comment on S-124 data dissemination issues related to e-navigation

Submitted by:	IHO World-Wide Navigational Warning Service, Chair
Executive Summary:	This paper provides HSSC with an update on NAVDAT, and comments on the future of navigational warning dissemination (including S-124) highlighted in HSSC16-07.1C.
Related Documents:	HSSC16-07.1C
Related Projects:	International Telecommunication Union (ITU) Radio Regulations, International Maritime Organization (IMO) resolution MSC.468(101), IMO resolution A.705(17), IMO resolution MSC.1/Circ.1645, IMO resolution MSC.530(106) NCSR 10/22, NCSR 10/WP.5 and NCSR 10/WP.7

Introduction

The World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC) thanks Germany for submitting its document (HSSC16-07.1C) and for raising potential dissemination issues for consideration by HSSC.

One potential new GMDSS service proposed for dissemination of maritime safety information (MSI) is Navigation Data Exchange (NAVDAT), a replacement or supplementary service for NAVTEX. Another that is being discussed is the VHF Data Exchange System (VDES). The views expressed at the International Maritime Organization (IMO) and WWNWS15 (held 4 to 8 September 2023) on the potential use of NAVDAT and VDES for dissemination of MSI, including its utility for S-124 navigational warnings, is provided.

VDES

WWNWS15 received an update from the IMO Secretariat on its progress to develop possible amendments to SOLAS chapters IV and V and performance standards and guidelines to introduce VDES and considered related proposals and comments.

The meeting also received an update from Mr. Hideki NOGUCHI (Japan), coordinator for the IMO correspondence group on VDES. He provided further information on VDES, the trials by the Japan Coastguard and Tokyo University of Marine Science and Technology, and the launch of test satellites by Norway, China and Denmark.

Discussions in the WWNWS included:

1. Further testing of VDES was required to understand resource (capacity and capability) implications for promulgation of MSI,
2. The cyber security protocols embedded into the VDES architecture.
3. Was VDES intended to be a standalone terrestrial system or would it only be beneficial with the satellite component – implications are if the latter, then information providers would have to wait until the full system has been developed before considering consequential changes to the various instruments.

NAVDAT

The IMO Maritime Safety Committee (MSC), at its 105th session (20 to 29 April 2022), approved guidance for the reception of maritime safety information and search and rescue related information as required in the Global Maritime Distress and Safety System (GMDSS) when it approved IMO MSC.1/Circ.1645. That circular provides guidance on the recognized MSI and SAR-related information broadcast services and the equipment which should be installed on board ships to meet the requirements of SOLAS chapter IV while enabling the flexibility to incorporate new technologies as they become recognized by the IMO.

At the 10th meeting of the IMO's Sub-Committee on Navigation, Communications, and Search and Rescue (NCSR 10), the WWNWS and IMO Member States paid particular attention to the use of "*recognized*" during the discussions on NCSR 10/8 *Development of Performance Standards for a Digital Navigational Data System (NAVDAT)*.

In the NCSR 10 report to MSC 108 (MSC 108/12 and NCSR 10/22), paragraphs 8.5 and 8.6 note concerns with NAVDAT. These include the implications of introducing NAVDAT, including carriage requirements, duplication of equipment, costs associated with shipborne equipment and shore-based stations, operational issues for dissemination of information and data formats supported by NAVDAT. Further, several delegations, while expressing support for the development of NAVDAT, believed a long-term strategy was necessary for the introduction of NAVDAT and that all implications should be carefully considered before taking a final decision.

In the report of the *Working Group on Communications* from NCSR 10 (NCSR 10/WP.5), it noted that the frequencies referred to in the draft performance standards for NAVDAT had not yet been included in Appendix **15** of the International Telecommunication Union (ITU) Radio Regulations and that they were to be considered by WRC-23.

Further, the *Working Group on SAR and Other Technical Matters* expressed the view (NCSR 10/WP.7) that there was a need for a clear strategy to address wider issues for the "recognition" of terrestrial systems in the GMDSS. The Group prepared a road map of elements, without prioritizing or ordering them, which should be considered for the introduction of the NAVDAT system in the future, and this was accepted by the Sub-Committee.

Implementation road map:

1. Identify the areas where NAVDAT can complement NAVTEX/GMDSS in providing maritime safety information to ships at sea and what identified gap(s) it is filling.
2. Determine if the intent is for NAVDAT to eventually replace NAVTEX, and if so, what are the time frame and regulatory amendments required.
3. Determine if NAVDAT can support the S-100 data model for providing maritime safety information to ships at sea, for navigational warnings, meteorological warnings and forecasts and ice information.
4. Develop performance (IMO), technical (ITU), test and certification (IEC) standards for the integration of NAVDAT into GMDSS.
5. Finalize amendments to Appendix 15 of the Radio Regulations to include the frequencies of NAVDAT.
6. Determine if equipment for shore-based transmission and/or shipborne reception simultaneously supports NAVDAT and NAVTEX in what capacity, i.e. forward and backward compatibility or only backward compatibility.
7. Engage with the IHO and WMO on the development of guidelines and procedures for the integration process, including a NAVDAT manual and operational implementation plan as a component of the WWNWS and Worldwide Met-Ocean Information Warning Service (WWMIWS).

8. Conduct and evaluate pilot projects to test the integration of NAVDAT into GMDSS.
9. Develop training and certification standards for ship operators and shore-based personnel.
10. Amend the terms of reference for the NAVTEX Coordinating Panel to monitor and evaluate the integration of the NAVDAT system to ensure compliance with standards, guidelines and procedures. Articulate the process for determining service areas and the process for formal recognition of applications.

Noting the comments and concerns from NSCR 10, it doesn't seem that MSC.1/Circ.1645 will be updated to include NAVDAT in the near future, as referenced in HSSC16-07.1C.

The future of MSI dissemination

IMO and IHO Member States responsible for the provision of navigational warnings are wary about implementing any new dissemination method without addressing the concerns in the aforementioned implementation roadmap because of implementation challenges experienced with Iridium SafetyCast.

In NSCR 10/22, paragraph 22.7.4, NCSR invited MSC 108 to determine if the IMO needs to develop a formal recognition framework for new terrestrial GMDSS services, such as NAVDAT, including consideration of implementation issues for shore-based facilities and cost issues.

HSSC16-07.1C notes that MSI is part of the GMDSS and a new transmission method for navigational warnings can only be implemented in the GMDSS structure by modifying the ITU Radio Regulations – the paper describes the process and the associated timeline.

One concern with this approach is that it might inadvertently constrain the dissemination method(s) for S-124. However, it does seem like a reasonable approach that the IMO should initiate work or, at the very least, begin discussions to enable the provision of S-124 into the IMO framework. If the IMO should initiate the work, it will hopefully generate discussions that are not limited in scope with respect to available dissemination methods such as NAVDAT, VDES, Enhanced Group Call (EGC), NAVTEX, or other known or mature methods.

MSC 108 is expected to adopt the draft resolution MSC.530(106)/Rev.1 on performance standards for electronic chart display and information systems (ECDIS) submitted by NCSR 10 (NCSR 10/22 Annex 4). In Appendix 1 of that resolution, in the *Reference Documents* section, it lists the international organizations that have developed technical standards and specifications for use in conjunction with that standard. Specifically, it notes IEC Publication 63173-2, *Maritime Navigation and Radiocommunication Equipment and Systems – Data Interface – Part 2: Secure Communication Between Ship and Shore.*

IEC 63173-2:2022 details the scope of secure communication between ship and shore (SECOM). SECOM provides technical interoperability, where the same service interface is used for exchanging the information regardless of its operational use, up to the level of exchanging information securely online. Although designed for IHO S-100 based products, SECOM is technically payload agnostic and applicable also for other types of data.

Communication between SECOM information services for data exchange relies on IP-based web services. The "last mile" between a SECOM information service and the end-user application is not defined in the IEC specification, thus the communication technology between the vendor API and a ship/shore system can be non-IP based as well as IP based.

The result of the adoption of the draft resolution MSC.530(106)/Rev.1 at MSC 108 is that the IMO will acknowledge the requirement for use of a broadband and IP-based connection to the S-100 ECDIS when it approves the route exchange via SECOM.

Action required of HSSC16:

The HSSC16 is invited to:

a. Note the paper, and

b. Provide observations which could assist IHO and IMO Member States responsible for the provision of navigational warnings to facilitate discussions in the IMO and IHO (especially WWNWS-SC) on available dissemination methods.