ENAV18-11.4

Formerly VDES1-12.1.1

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| MARITIME SAFETY COMMITTEE  97th session  Agenda item XX | MSC 97/XX/YY  DATE  Original: ENGLISH |

**WORK PROGRAM**

**New planned output on development of performance standards for  
VHF Data Exchange System (VDES)**

**Submitted by**

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| **SUMMARY** | |
| *Executive summary:* | This document proposes a new planned output on development of performance standards for VHF Data Exchange System (VDES). |
| *Strategic direction:* | 5.2 |
| *High-level action:* | 5.2.4, 5.2.5 and 5.2.6 |
| *Planned output:* | Performance Standard |
| *Action to be taken:* | Paragraph 26 |
| *Related documents:* | MSC95/INF. 12, NCSR3/14, NCSR3/INF.21 |

**Introduction and background**

1. This document is submitted in accordance with section 4 (Work planning and delivery process) of the annex 1 to MSC-MEPC.1/Circ.4/Rev.4 (*Guidelines on the organisation and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies*) on the submission of proposals for new planned outputs.
2. VHF Data Exchange System (VDES) was developed by International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) to address the future possibility of overload of the AIS VHF Data Link (VDL) using AIS technology for enhanced maritime radio communication under the Resolution **360 (WRC-12)**.
3. The outline of VDES was informed to the Committee by MSC95/INF.12 submitted by Japan, Sweden and IALA.
4. The technical details of VDES were stipulated in the Recommendation ITU-R M.2092-0 (*Technical characteristics for a VHF data exchange system in the VHF maritime mobile band*) approved at the Radiocommunication Assembly 2015 (RA-15).
5. World Radiocommunication Conference 2015 (WRC-15) agreed on regulatory provisions and frequency allocations for the terrestrial component of VDES and the satellite uplink in 2027 (ASM 1) and 2028 (ASM 2) channels. WRC-15 decided to continue studies pertaining to the designation of frequencies for the remaining satellite component of VDES for consideration by WRC-19 and revised Resolution 360 accordingly.

**IMO objectives**

1. This proposal is within the scope of IMO’s objectives for maritime safety and security, and is related to the Strategic Direction 5.2 and High-level Actions 5.2.4, 5.2.5 and 5.2.6.

**Compelling need**

1. VDES is already mentioned in several IMO documents, especially for e-navigation and modernization of GMDSS.
2. In the e-navigation strategy implementation plan (SIP), one of the tasks for solution 2 (Means for standardized and automated reporting) is to “Review the original AIS long range port facility as well as the new long range frequencies made available at WRC 2012 described in the latest revision of ITU-R M.1371-5, the revised IEC 61993-2, or the developments within VDES (VHF Data Exchange System)and …” (Table 2, ANNEX 7, NCSR1/28) and “Future communication systems could include VHF data (VDES) and NAVDAT, and be developed for internet based solutions, such as a maritime cloud, facilitating system wide information management solutions.” (paragraph 31, ANNEX 7, NCSR1/28).
3. In the report of the Correspondence Group on the review of GMDSS (NCSR3/14), Section 14 (Role of VDES) clearly identified the future possibility of the use of VDES for the distribution of Maritime Safety Information (MSI).
4. These documents consider VDES as a system to be implemented in the future. As paragraph 5 mentioned, ITU has already allocated the new frequencies for the terrestrial component and for the satellite component of ASM for VDES, and some radiocommunication manufactures have started the development of the prototype. Therefore the realisation of the part of VDES has become the foreseeable future.
5. If the development of VDES is conducted without the strong leadership of IMO that is the core and biggest beneficiary of maritime digital radiocommunication technology, the development will be carries out in an inappropriate way and the realisation of e-navigation and the modernisation of GMDSS will be significantly delayed.
6. It therefore is indispensable to show the manufacturers and future users some important elements such as functions, capabilities, and data exchanged, as the performance standards in order to ensure the smooth and appropriate development and enable VDES to be a key component of maritime digital infrastructure for both e-navigation and GMDSS.

**Analysis of the issue**

1. VDES consists of [four main components, AIS, ASM, terrestrial and satellite (only uplink by 2027 and 2028 channels) components]. While AIS was originally developed for navigational safety equipment that is defined under Chapter V of SOLAS Convention, VDES is developed for a radiocommunication equipment that is defined under Chapter IV of SOLAS Convention. VDES gives its top priority to AIS transmission and thus does not harm AIS functionality.
2. VDES can transmit and receive digital data autonomously as same as AIS and thus human involvement that usually burdens seafarers with additional work, is kept minimal.
3. The newly allocated channels, 2027 and 2028, are expected to be used for Application Specific Messages (ASM) that are designated its international use of AIS by SN.1/Circ. 289, with higher speed than AIS and thus can mitigate the load of AIS VHF Data Link (VDL) and exchange more data between ship and ship and ship and shore.
4. The terrestrial component of VDES can transmit and receive digital data with much higher speed than AIS, maximum of 32 times higher, and thus is expected to contribute to not only the safety but also the efficiency of navigation, security, logistics and even welfare of seafarers.

**Analysis of implications**

1. Introduction of new equipment always costs users both onboard and ashore but as AIS clearly shows, the economic effect or benefit that is brought by VDES, will overcome such cost and furthermore, VDES makes it possible to provide value-add services that can mitigate the operational and maintenance cost of maritime digital infrastructure.
2. There will be no additional administrative requirements or burdens by this new planned output. The completed Administrative Checklist from MSC-MEPC.1/Circ.4/Rev.4 is attached as ANNEX 2 of this proposal.

**Benefits**

1. VDES can be used for numerous cases and bring various benefits to various users. IALA has developed the use case models based on e-navigation. IALA has already defined the use case as “SAR communications” “Maritime Safety Information” “ship reporting” “Vessel Traffic Services” “charts and publications” “route exchange” and “logistics” that contribute to the safety and efficiency of navigation, protection of marine environment, security on the sea, reduction of seafarer’s workload, etc.
2. Therefore, the benefits brought by VDES can cover the all aspects of IMO matters and can also reach outside of IMO such as fishing operation, scientific survey and resource development.

**Industry standards**

1. [Industry standard for AIS component of VDES is already existed, IEC 61993-2 for class A AIS, but industry standards for other components of VDES are not existed and will be developed based on the performance standards developed by this proposal.]

**Output**

1. The expected output is the performance standards for VDES and associated documents if necessary. The development of the performance standards is carried out by NCSR Sub-Committee for two sessions, NCSR 5 and 6, with a target completion year of 2019.

**Human element**

1. VDES can be operated with the minimal human involvement and contribute to both effective decision making and avoidance of human error. It therefore is to meet the human element vision, principles and goals defined by IMO Resolution A.947 (23).
2. The completed human elements checklist from MSC-MEPC.7/Circ.1 is attached as ANNEX 1 of this proposal.

**Priority/urgency**

1. Since the development of VDES has already started receiving the results of WRC-15 and the expectation of maritime digital data exchange from maritime community is high, the new planned output should be given the high priority.

**Action required**

1. The Committee is invited to consider the proposal and if appropriate to include the new planned output “Development of performance standards for VDES” in the biennium work programmes of NCSR Sub-Committee in 2018 and 2019 with a target completion year of 2019.

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