Input paper: [[1]](#footnote-1) DTEC2-5.2.3.2

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **□** ENG **□** PAP **X** Input

**X** DTEC **□** VTS **□** Information

Agenda item [[2]](#footnote-2) n.n

Technical Domain / Task Number 2

Author(s) / Submitter(s) CHINA MSA

Proposals for Revised R1007 on VHF Data Exchange System VDES for Shore Infrastructure

# Summary

CHINA MSA has proposed suggestions for the revision of Recommendation R1007 based on the latest development trends of shore-based VDES.

## Purpose of the document

To ensure the R1007 is timely updated and keep consistency with all related IALA documents, and provide relevant suggestions for the development and construction of shore-based VDES.

## Related documents

1. IALA Guideline G1158 on VDES R-Mode.
2. IALA Guideline G1117 on VHF Data Exchange System VDES Overview.
3. IALA Guideline G1181 on Monitoring and Regulation of VDES Guidelines.

# Background

It is clearly stated in the IALA *2023-2027 work plan* that R1007 will be updated. The revision of R1007 document content has been ongoing for 5 years, during which VDES has made significant progress, and relevant documents have been updated by organizations such as IMO, ITU, IEC, and IALA. Therefore, in order to ensure that the R1007 document is consistent with current developments, there is an urgent need to revise it.

# Discussion

## IMO progress on VDES inclusion in SOLAS

The 10th session of the IMO NCSR was held in May 2023, the NCSR10 considered the development of amendments to “SOLAS IV and V” and performance standards on VDES as instructed by MSC103 [1]. The NCSR 10 agreed that amendments to SOLAS chapter V should be prioritized for finalization at NCSR11 while undertaking in parallel a technical, and has been established a correspondence group to regulatory and operational analysis of VDES and its communication component [2].

But the MSI provider have raised concern that it make another new system available for MSI when there was no imminent prospect of VDES being used by coastal States would not be appropriate [1]. So, if needed future work could continue by expanding the scope to introduce the system for wider application including the communication components under GMDSS. Hence, IMO should be proactive in ITU's WRC for the work to secure the maritime community's need and requirements over VDES as a communication tool within the scope of chapter IV.

## New edition of ITU-RM.2092-1 on Technical characteristics of VHF data exchange systems in the maritime mobile frequency band was developed

In February 2022, ITU completed the revision of ITU-R M.2092 and released ITU-RM.2092-1, which specifies the complete VDES system characteristics including ground-based VDE, satellite based VDE, ASM, and AIS[3]. In addition, ITU-R Working Party 5B (WP 5B) was held from 10th to 21st July 2023. This was the last meeting in the study cycle from 2019 to 2023. The main focus of the WP5B meeting was on the revision of several ITU Recommendations and the introduction of two ITU study questions, namely study questions on “VHF digital voice” and on “VDES R-Mode” [4][5].

## Standard of IEC PAS 63343:2021 on Maritime navigation and radio communication equipment and systems was developed

IEC first carried out the standard development work for AIS/ASM stations. As early as February 2021, IEC PAS 63343 was publicly released, which was developed based on ITU-RM.2092-0. It specifies the technical requirements, testing methods, and test results required for VDES system stations with ASM functionality, and supports the practical application of shore-based VDES[6].

The IEC standard will be further revised on the basis of ITU-R M.2092-1, indicating that the detection standards for VDES will be increasingly improved.

## Guideline G1158 on VDES R-MODE constantly have been improved

The first version of G1158 VDES-R Mode was released in December 2020. G1158 describes the construction goals and requirements of the VDES-R mode system, and explains how to set the VDES-R mode in the VDES framework and its performance under different conditions and environments[7].

At present, VDES R-mode system has begun to be tested in different places, such as the Baltic Sea, Trondheim Fjord, China and Inland waterways[8]. VDES R-mode system is expected to serve as a contingency Positioning, Navigation and Timing (PNT) system for maritime shipping, and may even find more other uses in the future.

## Guideline G1117 on VDES Overview was released

The G1117 VDES Overview was released in its second edition in December 2017. G1117 does not contain technical details, only a general introduction to VDES, designed to help stakeholders understand, develop and promote VDES, and clarify the priority order of services provided by VDES [9]. At the same time, G1117 analyzes seven types of maritime services that can be applied to VDES, including search and rescue communications, maritime safety information, ship reporting, ship traffic management, chart and hydrological information publication, route information exchange and logistics services.

## New Guideline G1181 on VDES VHF DATA LINK (VDL) INTEGRITY MONITORING WAS RELEASED

The G1181 was released in December 2023. The integrity of VDES VDL is essential for the correct use of VDES. It provides an overview of the source of VDES VDL vulnerability and proposes methods for IALA members to detect and mitigate the effects of invalid VDL transmissions, and provides assurance for the reliability and resilience of VDES services [10].

# proposal

It is proposed that the DTEC committee taking the documents mentioned in paragraph 3 as reference when revising R1007.

# References

1. IALA. DTEC1-3.3 IALA report on IMO NCSR 10 ,10-19 May 2023.
2. IALA. DTEC1-3.1.4 Report of PAP50, 6-8 September 2023.
3. International Telecommunication Union. Technical characteristics for a VHF data exchange system in the VHF maritime mobile band: ITU-R M.2092-1. 2022, 2.
4. IALA. DTEC1-13.1 Final report of DTEC1, 25th September to 5th October 2023.
5. IALA. EM31-3.5.1 Report on IMOITU EG 18 5 to December 2022 and ITU-R WP5B meeting November 2022, 14 to 25 November 2022.
6. International Electro technical Commission. Maritime navigation and radio communication equipment and systems-VHF data exchange system-Requirements and methods of testing for stations including ASM functionality: IEC PAS 63343. 2021, 2.
7. IALA G1158 on VDES R-MODE.
8. IALA. DTEC1-3.1.1 Report 20th IALA Conference 2023.
9. IALA G1117 on VHF Data Exchange System (VDES) Overview.
10. IALA G1181 on VDES VHF Data Link (VDL) Integrity Monitoring.
11. IALA. DTEC1-3.1.3.1 Report Council 77, 28 May 2023.
12. IALA. DTEC1-3.1.3.2 Report Council 78, 3 June 2023.

# Action requested of the Committee

The Committee is requested to consider the propasal in paragraph 4, and take action as appropriate.

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**IALA** **RECOMMENDATION**

**(NORMATIVE)**

R1007

THE VHF DATA EXCHANGE SYSTEM (VDES)

FOR SHORE INFRASTRUCTURE

**Edition** **n.n**

**December** **20nn**

**urn:mrn:iala:pub:r1007:ed1.1**

Revisions to this document are to be noted in the table prior to the issue of a revised document.

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| --- | --- | --- |
| **Date** | **Details** | **Approval** |
| 16 June 2017 | 1st issue |  |
| September 2020 | Edition 1.1 Editorial corrections. |  |
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THE COUNCIL

**RECALLING:**

1. The function of IALA with respect to Safety of Navigation, the efficiency of maritime transport and the protection of the environment.
2. Article 8 of the IALA Constitution regarding the authority, duties and functions of the Council.
3. The work of IALA in the defining and implementing the Automatic Identification System (AIS).
4. the VHF Data Exchange System (VDES) includes functions for AIS, application specific messages (ASM), and VHF data exchange (VDE).

**RECOGNIZING** that the VHF Data Exchange System (VDES) is a developing communications system which is being coordinated by IALA in consultation with the International Telecommunication Union (ITU), the International Maritime Organization (IMO) and the International Electrotechnical Commissions (IEC).

**RECOGNIZING** **ALSO** that the VHF Data Exchange System (VDES) has a wide range of applications.

**RECOGNIZING** **FURTHER** that continuously exploring the needs and requirements of VDES in the maritime field, further expanding its application scope.

**NOTING** that:

1. The World Radiocommunication Conference 2015 (WRC-15) approved frequency use for VDE terrestrial (reception and transmission) and ASM terrestrial (reception and transmission) and ASM satellite reception.
2. ~~WRC-19 will consider allocation of frequencies for the satellite component for VDE (reception and transmission).~~

At the WRC-23 meeting, IALA conveyed its position on key issues related to the use of the radio frequency spectrum in the maritime sector, especially on R-Mode and VDES.

1. IALA Guideline G1117 *VHF Data Exchange System (VDES) Overview* describes VDES and its future role in digital marine connectivity for safety of navigation.
2. IALA Guideline G1158 *VDES R-Mode* describes the setting of VDES-R mode in the VDES framework and its technical performance under different conditions.
3. IALA Guideline G1181 provides an overview of the source of VDES VDL vulnerability and propose methods for IALA members to detect and mitigate the effects of invalid VDL transmissions.
4. ITU has released ITU-RM.2092-1 on *Technical characteristics for a VHF data exchange system in the VHF maritime mobile band*, which specifies the complete VDES system characteristics including ground-based VDE, satellite based VDE, ASM, and AIS.

**CONSIDERING** the advice of the e-Navigation Committee provided to Council at its 64th Session,

**CONSIDERING** Guideline G1158 can serve as a guiding document for relevant departments to implement VDES R-mode systems, and for R&D personnel to design VDES R-mode systems/equipment.

**CONSIDERING** **ALSO** that the VDES R-Mode has been applied to multiple scenarios.

**CONSIDERING FURTHER** that the VDES R-Mode still needs continuous improvement in its application.

**ADOPTS** Recommendation R1007, the VHF Data Exchange System (VDES) for Shore Infrastructure,

**INVITES** Members and marine aids to navigation authorities worldwide to implement the provisions of the Recommendation,

**~~RECOMMENDS~~**~~that National Members and other authorities providing shore infrastructure for marine aids to navigation services should plan to upgrade existing AIS shore infrastructure to VDES shore infrastructure to provide enhanced digital connectivity, and~~ ~~that those authorities without existing AIS shore infrastructure should consider implementing VDES shore infrastructure.~~

**RECOMMENDS** that:

1. The relevant departments should plan to upgrade existing AIS shore infrastructure to VDES shore infrastructure, thereby enhancing digital connectivity.
2. Those authorities without existing AIS shore infrastructure should consider implementing VDES shore infrastructure.
3. The VDES-R mode system should use existing shore infrastructure as much as possible.
4. The VDES implements data integrity monitoring at the VDES link level.
5. The expansion of VDES application scope requires coordination and resource sharing from multiple parties.
6. The VDES related applications need to pay attention to network security issues.

**REQUESTS** the IALA DTEC Committee, or such other committee as the Council may direct, reviews the Recommendation and proposes amendments, as necessary.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)