**Input paper: [[1]](#footnote-1)** DTEC5-6.2.3.7

**Input paper for the following Committee(s):** **Purpose of paper:**

(Select as appropriate)

ARM  ENG  PAP  Input

DTEC VTS  Information

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

**Technical domain/ Task number** 2 …………………………………

**Author(s)/Submitter(s)** …………………………………

PROPOSAL ON REVISING R0144 HARMONIZED IMPLEMENTATION OF APPLICATION SPECIFIC MESSAGES (ASM)

# Summary

According to the development of VDES, the proposal summarizes the current status of ASM, and proposes revision suggestions for R0144.

## Purpose of the document

This document proposes modification suggestions for R0144 on Harmonized Implementation of Application Specific Messages (ASM), based on the development process of ASM, so as to promote subsequent revision work.

## Related documents

1. ITU-R M.2092-1, Technical characteristics for a VHF data exchange system in the VHF maritime mobile band, February 2022.
2. ITU-R M.1371-5, Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band, February 2014.
3. IMO SN.1/Circ.289, Guidance on the use of AIS application-specific messages, June 2010.
4. IMO SN.1/Circ.290, Guidance for the presentation and display of AIS Application-Specific Messages information, June 2010.
5. IMO SN.1/Circ.243, Guidelines for the presentation of Navigation-related Symbols, Terms and Abbreviations, June 2019.
6. IALA G1117, VHF Data Exchange System (VDES) Overview, December 2022.
7. IALA G1181, Monitoring and Regulation of VDES Guidelines, December 2023.
8. IALA G1095, Harmonized implementation of Application-Specific Messages (ASM), May 2013.
9. IALA R0123, The Provision of Shore Based Automatic Identification System (AIS), June 2007.
10. IALA R0124, The AIS service, December 2012.
11. IALA R0126, The Use of the Automatic Identification System (AIS) in Marine Aids to Navigation Services, December 2021.
12. IALA G1082, An overview of AIS, June 2016.
13. IALA G1062, Establishment of AIS as an Aid to Navigation introduces the implementation and application of AIS AtoN, December 2008.
14. IALA R1007, The VHF Data Exchange System (VDES) for shore infrastructure, June 2024.

# Background

IMO Maritime Safety Committee-110th session (MSC 110) approved draft amendments to SOLAS chapter V and its appendix to introduce the VHF Data Exchange System (VDES) as an alternative to the Automatic Identification System (AIS) for shipborne navigation, and these amendments will be submitted with a view to adoption by MSC 111th, along with consequential amendments to other instruments.

Although ASM is an important component of VDES, it already has very mature applications. Earlier, IMO released SN.1/circ. 289 *Guidelines for the Use of AIS-ASM* and SN.1/Circ. 290 *Guidelines for the Representation and Display of AIS-ASM*, which clearly regulated the use of international ASM messages and the display on shipborne equipment or systems.

Similarly, IALA has also developed guidelines or recommendations related to ASM, such as G1062, R0123, R0124, R0126, R0144, R1095, etc. In order to ensure the normal use of ASM in the region, IALA has established some guidelines or recommendations, and collect regional ASM binary information to facilitate countries in uploading regional ASM binary information standards through its website（https://www.iala-aism.org/asm/）.

In recent years, IALA and ITU have also updated guidelines or recommendations related to ASM. Therefore, it is time to start the task on the revision of R0144.

# Discussion

The current document R0144 is mainly about AIS-ASM and has not yet involved VDES. Therefore, the revision in this article is mainly based on VDES, and the main revised criteria are as follows.

## Overview and Functions of VDES

VDES is a new generation of maritime digital communication system that integrates AIS, ASM, and VDE.

VDES was reassigned VHF frequency bands at WRC-15 (2015) and WRC 19 (2019), with ASM frequencies being ASM1 (161.950 MHz) and ASM2 (162.000 MHz).

VDES channel is a duplex channel with two frequency bands separated by 4.6 MHz, both of which are used to facilitate VDES communication between ships, coastal stations, and satellites.

VDES does not reduce the performance of AIS, while providing additional channels for ASM and VDE, effectively overcoming the limitations of AIS and improving its electronic navigation data exchange capability.

## relevant documents on ASM

Guidance on ASM from IMO:

* IMO SN.1/circ. 289 *Guidance on the use of AIS application-specific messages* outlines the purpose and scope of international ASM use and provides usage guidelines.
* IMO SN.1/circ. 290 *Guidance for the presentation and display of AIS Application-Specific Messages information* introduces the graphic display and presentation of specific message information for AIS applications based on practical cases.
* IMO SN.1/circ. 243 *Guidelines for the presentation of Navigation-related Symbols, Terms and Abbreviations* specifies the symbols used on shipborne navigation systems and equipment to display navigation related information.

Recommendations on ASM from ITU：

* ITU-R M.2092-1 *Technical characteristics for a VHF Data Exchange System in the VHF maritime mobile band* specifies the technical characteristics of VDES, clarifies the common technical elements of ASM and the technical characteristics of ASM channels.
* ITU-R M.1371 *Technical characteristics for an Automatic Identification System using time division multiple access in the VHF maritime mobile frequency band* specifies the technical characteristics of using Time Division Multiple Access AIS in the VHF maritime mobile band.

Guidelines on ASM from IALA：

* IALA G1095 *Harmonized and implementation of Application-Specific Messages (ASM)* explains the harmonized and implementation management of international ASM and regional ASM.
* IALA G1082 *An Overview of AIS* explains the definition and functions of AIS ASM.
* IALA G1117 *VHF Data Exchange System (VDES) Overview* describes the development, functions, and roles of VDES.
* IALA G1181 *Monitoring and Regulation of VDES Guidelines* outlines the sources of VDES VDL vulnerabilities and proposes methods to detect and mitigate the impact of invalid VDL transmissions.

## PROPOSAL

Based on the above situation, the harmonized and implementation of ASM should consider the following points:

* At present, the application of AIS and VDES is parallel.
* The conversion from AIS ASM application to VDES ASM application should be considered.
* The implementation of VDES applications should also consider the relevant technical requirements, recommendations, and guidelines published by IMO, ITU, and IALA.
* The VDES-ASM message encoding needs further unification in time.
* The priority of using AIS, ASM, VDE-TER, and VDE-SAT in VDES should be considered.
* Relevant countries or institutions should be encouraged to support the collection of ASM in IALA.

Considering the above issues, a draft revised R0144 has been developed. It is proposed that the DTEC Committee review the draft revised R0144 in the annex.

# References

1. IALA, DTEC4-12.1 Final report of DTEC4, March 2025.
2. IALA G1117, VHF Data Exchange System (VDES) Overview, December 2022.
3. MSC 110/WP.1/Rev.1, Draft report of the Maritime Safety Committee on its 110th session, July 2025.
4. IMO SN.1/Circ.289, Guidance on the use of AIS Application-Specific Messages, June 2010.
5. IMO SN.1/Circ.290, Guidance for the presentation and display of AIS Application-Specific Messages information, June 2010.
6. IMO SN.1/Circ.243, Guidelines for the presentation of Navigation-related Symbols, Terms and Abbreviations, June 2019
7. ITU-R M.2092-1, Technical characteristics for a VHF Data Exchange System in the VHF maritime mobile band, February 2022.
8. ITU-R M.1371-5, Technical characteristics for an Automatic Identification System using time division multiple access in the VHF maritime mobile frequency band, February 2014.
9. IALA G1095, Harmonized implementation of Application-Specific Messages (ASM), May 2013.
10. IALA G1082, An overview of AIS, June 2016.
11. IALA G1117, VHF Data Exchange System (VDES) Overview, December 2022.
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14. IALA R0123, The AIS service, June 2007.
15. IALA R0124, The provision of shore based Automatic Identification System (AIS), December 2012.
16. IALA G1062, Establishment of AIS as an Aid to Navigation introduces the implementation and application of AIS AtoN, December 2008.
17. IALA R1007, The VHF Data Exchange System (VDES) for shore infrastructure, June 2024.

# Action requested of the Committee

The Committee is requested to consider the draft revised R0144 in Annex, and take actions as appropriate.

Annex

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| **IALA Recommendation**  **(Normative)** |

R0144 (E-NAV-144)

HARMONIZED IMPLEMENTATION OF APPLICATION SPECIFIC MESSAGES (ASM)

**Edition 1.1**

**June 2011**

**urn:mrn:iala:pub:r0144: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** |
| June 2011 | 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 ~~that one of the aims of the association is to foster the safe, economic and efficient movement of vessels~~ and the protection of the environment ~~through the improvement and harmonisation of aids to navigation and Vessel Traffic Services~~;
2. Article 8 of the IALA Constitution regarding the authority, duties and functions of the Council;
3. Automatic Identification Systems (AIS) may use binary messages for the transmission of Application Specific Messages (ASM) as a means for certain type of communication;
4. The VHF Data Exchange System (VDES) includes functions for AIS, ASM, and VHF Data Exchange (VDE).

**RECOGNIZING:**

1. Regulation 13 of Chapter V of the SOLAS Convention 1974, as amended, on the establishment and operation of aids to navigation;
2. **~~RECOGNIZING ALSO~~** Regulation 10 of Chapter V of the SOLAS Convention 1974, as amended, on ships routeing measures;
3. **~~RECOGNIZING FURTHER~~** Regulation 4 of Chapter V of the SOLAS Convention 1974, as amended, on navigational warnings;

**RECOGNIZING FURTHER** that work carried out by IALA on ASM systems has facilitated the development and adoption of a suite of technical and operational publications by other bodies such as IMO, ITU, etc :

1. IMO through the publication of SN/Circ. 289 has updated the internationally recognized definitions of ASM for operational digital communication through the use of AIS ; and
2. IMO through SN/Circ. 290 provided basic guidance on portrayal issues;
3. The World Radiocommunication Conference 2015 (WRC-15) allocated frequencies for VDE terrestrial (reception and transmission), ASM terrestrial (reception and transmission) and ASM satellite reception;
4. The World Radiocommunication Conference 2019 (WRC-19) allocated frequencies for the VDE satellite (reception and transmission);
5. ITU-R M.1371-5, Annex 4 provides technical guidance on the use of ASM;
6. ITU has developed Recommendation ITU-R M.2092 Technical characteristics for a VHF Data Exchange System in the VHF maritime mobile band;
7. IMO MSC-110th session has approved the inclusion of VDES in Chapter V of the International Convention for SOLAS, and has passed draft amendments to appendices such as *Performance Standards for Shipborne VHF Data Exchange System (VDES)* and *Guidelines for The Operational Use of Shipborne VHF Data Exchange System (VDES)*.

**NOTING:**

1. ~~that~~ The definition and applicability of Regional ASM is under the responsibility of the National Competent Authority responsible for the relevant Designated Area Code (DAC) of a Regional ~~Application Specific Message~~ ASM;
2. **~~NOTING ALSO~~** ~~that~~ The use of Regional ASM for various operational purposes is widespread and developing rapidly;
3. **~~NOTING ALSO~~** ~~that technical questions requiring guidance on the implementation of ASM has previously arisen and is likely to arise in the future~~; The VDES has a wide range of applications. VDES provides AIS, ASM, VDE;
4. VDES provides a solution to the current AIS overload problem, reduces the pressure of AIS data communication, and improves the quality of maritime communication;
5. In the VDES components, ASM technology is relatively mature and has a certain application foundation;
6. **~~NOTING ALSO~~** ~~that~~ The work carried out by IALA on shipborne automatic identification systems has facilitated the development and adoption of a suite of technical and operational publications by other bodies such as IMO, ITU, IHO and IEC;
7. It is desirable to continuously explore the use cases and applications in enabling maritime services.

**NOTING ALSO** that IALA at the request of the ITU is maintaining Technical Clarification for ITU-R M.1371 to support harmonization of its member’s application of AIS/VDES;

**NOTING ALSO** that IALA has adopted:

* Recommendation R0123 (A-123) on the *Provision of Shore Based Automatic Identification Systems* (AIS) describes the relevant matters regarding the implementation of shore based AIS;
* Recommendation R0124 (A-124) on *AIS Shore Stations and Networking Aspects Related to the AIS Service* provides recommendations regarding AIS services;
* Recommendation R0126 (A-126) on the *Use of the Automatic Identification System (AIS) in Marine Aids to Navigation Services* introduces the use of the AIS in marine AtoN services;
* Guideline G1062 on *Establishment of AIS as an Aid to Navigation* introduces the implementation and application of AIS AtoN; and
  + The *IALA NAVGUIDE* (5th Edition), which includes a section on the use of AIS as an aid to navigation;
  + Guideline G1095 on the *Harmonized Implementation of Application-Specific Messages (ASM)* describes how ASM should be implemented in a harmonized manner;
  + Guideline G1082 on the *An Overview of AIS* describes the definition and function of ASM;
  + Guideline G1117 on the *VHF Data Exchange System (VDES) Overview* describes VDES and its future role in digital marine connectivity for safety of navigation, and provides examples of VDES ASM protocol format messages;
  + Recommendation R1007 on the *VHF Data Exchange System (VDES) for shore infrastructure* provides relevant recommend for the promotion and application of shore based VDES;
  + Guideline G1181 on the *VDES VHF Data Link (VDL) Integrity Monitoring* provides an overview of the source of VDES VDL vulnerability and proposes methods to detect and mitigate the effects of invalid VDL transmissions;

(Reference documents are the latest from the date of issuance of these guidelines. Readers have to consider that some will be amended or revoked, and care should be taken to follow up with the most up to date information)

**CONSIDERING:**

1. The various applications of AIS/VDES have been identified by IMO, ITU, IEC and IALA;
2. **~~CONSIDERING FURTHER~~** The strategic elements of the IMO e-Navigation strategy and the supportive work undertaken by the ~~e-Navigation~~ Digital Technologies Committee of IALA;
3. **~~CONSIDERING FURTHER~~** ~~that~~ The IALA has previously initiated the collection of definitions of Regional ASM with the aim of facilitating and identifying the potential for harmonization, and that an updated collection with a user-friendly web access portal now exists, accessible via the IALA website;
4. **~~CONSIDERING FURTHER~~** ~~that~~ The submission of Regional ASM to the IALA collection is not a matter of approval, but a matter of collecting the Regional ASM in use;
5. **~~CONSIDERING FURTHER~~** ~~that~~ The establishment of a formal Register for ASM and a related governance process would occur after the initial collection process;
6. The ASM message format needs to be further clarified When promoting ASM applications;
7. The broadcasting methods and formats of AIS-ASM and VDES-ASM are quite different, the following factors need to be considered:
   * ASM message type. AIS-ASM only has four types of messages, and VDES-ASM has added regional geographic multicast, scheduled addressing and broadcast information, and recurring addressing and broadcast information;
   * The AIS component of VDES should be capable of providing all modes of operation as described in Recommendation ITU-R M.1371;
   * Link ID (number of time slots, FEC, SAT). According to ITU-R M.2092-1, VDES-ASM includes 7 types of Link IDs.

**ADOPTS** Recommendation R0144 *Harmonized Implementation of Application Specific Messages (ASM)*.

**INVITES** Member States and marine aids to navigation authorities worldwide to implement the provisions of the Recommendation.

**RECOMMENDS** that IALA members states and other appropriate authorities which as a matter of priority provide Marine Aids to Navigation services:

1. ~~National as well as Industrial Members and other~~ Should authorities recognize the urgency of the need for harmonization of content, encoding, application and portrayal of ASM to facilitate communications, including data exchange, among ship to ship, ship to shore, shore to ship, shore to shore and other users, through digital communication links;
2. ~~Members as a matter of priority~~ Should support the efforts of IALA to collect the definitions, applications and portrayal guidance on these, and submit their information to the online IALA collection, taking into account the rapid development in the use of Regional ASM for various purposes;
3. ~~National Members as a matter of priority~~ Should take the steps necessary to ensure that a National Competent Authority is assigned the responsibility for managing the use of Regional ASM, as well as monitoring and managing the use of the AIS VHF Datalink, to ensure its safe function for safety of navigation;
4. ~~Members~~ Should make use of the IALA ASM collection by taking into account other updated definitions of ASM and related guidance, before developing new or implementing the use of existing Regional ASM;
5. ~~Members~~ Should contribute to the efforts of the IALA ~~e-Navigation~~ Digital Technologies Committee to further develop guidelines for the harmonized implementation of ASM for use via AIS or other means of digital communication;
6. ~~Members~~ Should ensure that other relevant parties engaged in the use of ASM to contribute to the IALA ASM collection through their National IALA Member.
7. Should fully utilize the capacity and functionality of VDES:
   * Implementing VDES shore infrastructure;
   * Implementing VDES data integrity monitoring at the VDES link level;
   * Expansion of VDES application scope requiring coordination and resource sharing from multiple parties;
   * Addressing network security issues;
   * VDES should give its highest priority to AIS position reporting and safety related information, followed by second priority to ASM, third priority to VDE-TER and then to VDE-SAT;
   * VDES should be capable of separately disabling VDE-SAT, VDE-TER, or ASM.
8. Should fully consider the compatibility between VDES-ASM and AIS-ASM:
   * According to the application type, select the appropriate carried message type;
   * When drafting the ASM binary information standard, a flexible message mechanism should be introduced as much as possible;
   * The Link ID type should be reasonably selected based on the broadcast method and content, and physical channels, data length and importance.

**REQUESTS** the DTEC Committee or such other committees to keep the Recommendation under review and to propose 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)