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RESCUE  
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**REVISION OF ECDIS GUIDANCE FOR GOOD PRACTICE (MSC.1/CIRC.1503/REV.1)  
AND AMENDMENTS TO ECDIS PERFORMANCE STANDARDS  
(RESOLUTION MSC.232(82))**

**Visualization of AIS AtoN and ASM on shipborne navigation displays**

**Submitted by Canada, [Norway], [Republic of Korea], IALA**

**SUMMARY**

*Executive summary:* In the course of implementing the IMO's e-Navigation Strategy Implementation Plan (MSC.1/Circ. 1595 E-Navigation Strategy Implementation Plan – Update 1), Member States have observed significant barriers to mariner access to, and use of, maritime safety information promulgated by coastal authorities via AIS AtoN and AIS Application Specific Messages (ASM). This paper aims to outline the problem and request the Sub-Committee to address it by requiring a connection between AIS and ECDIS.

*Strategic direction, if applicable:* 7

*Output:* Amendments to ECDIS performance standards (resolution MSC.232(82))

*Action to be taken:* Paragraph 15

*Related documents:* MSC 100/20, paragraph 17.9; MSC 102/24, para 21.14; MSC 104/18, para 15.19, SN.1/Circ.289, SN.1/Circ.290, MSC.1/Circ.1503/Rev.1, MSC.1/Circ. 1595 and MSC.232(82))

**Overview**

1 As an increasing number of coastal administrations use AIS AtoN and AIS Application Specific Messages (ASM) to promulgate maritime safety information with mariners. It has been observed that the proportion of mariners able to consume information via these channels is well below the desired levels, and this presents a barrier to integrating AIS AtoN/ASM information with onboard systems in accordance with the IMO's e-Navigation Strategic

Implementation Plan. At the heart of this issue is the absence of a mandatory interface between AIS transponder, RADAR, electronic chart display systems, and other onboard systems.

2 Various types of AIS AtoN (physical and virtual) are in use by national authorities, ports, and other maritime stakeholders world-wide to improve navigational safety and increase situational awareness by augmenting and enhancing waterway markings.

3 Similarly, maritime stakeholders around the world have been using ASM in accordance with SN.1/Circ.289 (Guidance on the Use of AIS Application-Specific Messages) for broadcasting important navigational information such as near real-time environmental, meteorological, and hydrographical information, water levels, air gap information, and lock status. In addition, SN.1/Circ.290 (Guidance for the Presentation and Display of AIS Application-Specific Messages Information) provides guiding principles applicable to the display of AIS Application-Specific Messages information both for shipborne equipment/systems (e.g., ECDIS, RADAR and INS) and for shore-based systems (e.g., VTS Centre console).

4 It is also foreseen that the recently approved VHF Data Exchange System (VDES), which has a terrestrial and a satellite component providing global coverage, will likely reuse most of the AIS ASM to facilitate the transition to this new system for broadcasting important information to mariners and shore-side authorities.

5 In the course of the extensive work undertaken to implement e-Navigation by national AtoN authorities particular by Canada, Norway, the Republic of Korea, and Sweden in cooperation with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) it has become increasingly clear that a more standardization and integration of systems is needed to facilitate meaningful and efficient progress.

#### **IALA's guidance and work to implement AIS AtoN/ASM**

6 IALA has issued guidance in the use and operation of AIS AtoN, such as:

- .1 G1081 - Provision of Virtual Aids to Navigation,
- .2 G1084 - Procedure for the Authorisation of AIS AtoN,
- .3 G1098 - Application of AIS AtoN on Buoys,
- .4 R0126 The Use of the Automatic Identification System (AIS) in Marine Aids to Navigation Services (A-126), and
- .5 R0143 - Provision of Virtual Aids to Navigation.

7 IALA has also taken steps to more fully understand the state of AIS AtoN/ASM implementation to identify opportunities to inform its ongoing work on this topic. At the end of 2021, IALA surveyed its national members, comprising the AtoN authorities for 86 countries, on the status of AIS AtoN/ASM utilization in national waters. Survey results were reported in the paper ARM15-3.2.3.

8 IALA learned that a large majority of respondents provide these services to varying degrees. However, respondents signaled a high degree of uncertainty about the intended recipients' ability to receive and display these services. Approximately one-in-three ECDIS and ECS, and about one-in-four RADARs, can neither access nor benefit from the AIS ASM/AtoN services provided by national authorities. In this context, "access" could be interpreted to mean having the awareness, knowledge, equipment, training, funds, and ultimately, the capability to using these services.

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9 Several countries have identified challenges in pursuing implementation, despite the existence of IMO guidance, such as SN.1/Circ.289, 290 and SN.1/Circ.243. As there are no mandatory requirements attached to these instruments, implementation is hampered, in part, by a lack of standardization among ECDIS manufacturers and in part by a lack of any requirement in the current ECDIS Performance Standards.

10 As an example, in Canada, the Canadian Coast Guard, Canadian ports, pilotage authorities, and the St. Lawrence Seaway have trialled AIS AtoN and AIS ASM since 2004 and many of these tests are nearing operational status. Canada is also making preparations for testing VDES. Since 2017, the Canadian Coast Guard surveyed mariners using ECDIS, portable pilot units (PPU), and ECS on their ability to receive AIS AtoN and ASM information with mixed results. Most PPU could receive both AIS AtoN and AIS ASM broadcasted in Canada. However, access via ECDIS was more varied, both in the equipment's ability to receive the information and in how it was portrayed. Consequently, it is not currently possible for all ships in Canadian waters to universally and uniformly access and use the important, broadly available information services, such as air gap, ice routes, and area notices to protect vulnerable marine life.

11 Jurisdictions with more limited experience regarding the implementation of AIS AtoN and AIS ASM have also, nonetheless, observed uneven accessibility to this important information by ship operators. Arising from an informal survey in 2019 of ships operating in Norway's waterways, the Norwegian Coastal Authority (NCA) observed that not all ships with ECDIS could display ASM, creating an uneven access to broadcast maritime safety information and uneven opportunities for maintaining maritime domain situational awareness, thereby affecting safety.

### **IMO e-Navigation Strategic Implementation Plan**

12 As per MSC.1/ Circ. 1595, the IMO e-Navigation Strategic Implementation Plan sub-solution S4.1 calls for integration and presentation of available information in graphical displays (including MSI, AIS, charts, RADAR, etc.) received via communication equipment. This integration should take place in a harmonized fashion, and to a limited degree, has already started. Guidance on how to integrate AIS information into navigation equipment can, for example, be found in IEC 61174 (*Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results*) and IEC 62288 (*Maritime navigation and radiocommunication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results*).

13 However, it is not mandatory to connect the AIS receiver to other navigation equipment, leading to uncertainty and a lack of uniformity about who will receive AIS AtoN/ASM information, and service silos where only specific, equipped user groups (e.g., pilots) are receiving the broadcasts. This type of scenario undermines the efficiency of AIS AtoN and AIS ASM as a broadcast communication tool and poses challenges for the success of the Strategic Implementation Plan.

14 Mandating the connection between the ECDIS and the AIS receiver would be a very positive first step towards solving the overall challenges. However, several other challenges will remain, such as legacy ECDIS will not be covered by such a change. Additionally, ECDIS software may require periodic updating to remain current with AIS standards development, in similar fashion with IHO chart and publication standards.

### **Action requested of the Sub-Committee**

15 The Sub-Committee is requested to:

- .1 take note of this observed impediment to implementing the IMO's e-Navigation Strategic Implementation Plan, and to consider developing recommendations to facilitate the integration of AIS AtoN/ASM information with onboard systems.
- .2 amend MSC.232(82), Module C - INTERFACING AND INTEGRATION, to require that ECDIS be connected to AIS transponder according to the wording below:
  - .1 7.1 Radar information ~~and/or AIS information~~ may be transferred from systems compliant with the relevant standards of the Organization. **AIS information should be transferred from systems compliant with the relevant standards of the Organization.** Other navigational information may be added to the ECDIS display. However, it should not degrade the displayed SENC system database information and it should be clearly distinguishable from the SENC system database information.
  - .2 15.2 ECDIS should be connected to the ship's position fixing system, to the gyro compass, **automatic identification system**, and to the speed and distance measuring device. For ships not fitted with a gyro compass, ECDIS should be connected to a marine transmitting heading device.