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

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

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Agenda item [[2]](#footnote-3) 3.2

Technical Domain / Task Number 2 …………………………………

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Submission to IMO NCSR9 regarding AIS AtoN/ASM information in shipborne equipment

# Summary

This paper provides an update on the efforts that have gone into drafting a submission to IMO NCSR requesting that the connection between the ECDIS and the AIS transponder become mandatory.

# Discussion

Following ARM14 it was decided to conduct a survey among the IALA national members regarding their use of AIS AtoN and AIS ASM for the purpose of informing on the current AIS implementation in a submission to IMO requesting a change to the ECDIS Performance Standard requiring that the ECDIS be connected to the AIS transponder. This survey was conducted using the questions drafted at ARM 14. The preliminary results of the survey were used to draft the NCSR submission. Since the preliminary results from the survey were received, a group consisting of Australian Maritime Safety Authority, Canadian Coast Guard, Finnish Transport Agency, IALA-ARM Chair and Vice Chair, IALA Secretariate, Korean AtoN Authority, Norwegian Costal Administration, Swedish Maritime Administration and Transport Canada have worked on the draft submission by correspondence and virtual teleconference.

The draft is found in Appendix 1 for awareness and as an invitation for IALA national members to discuss with their IMO delegations for support where possible.

# Action requested of the Committee

The Committee is requested to:

1. Note this paper
2. Invite IALA national members to discuss with their IMO delegations for support where possible.
3. Input paper to NCSR9

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| SUB-COMMITTEE ON NAVIGATION,  COMMUNICATIONS AND SEARCH AND  RESCUE  9th session  Agenda item 16 | NCSR 9/16/xx  xx March 2022  Original: ENGLISH  Pre-session public release: |

**Work Programme**

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

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

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| **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 this problem and requests 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, para15.19, 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. They have observed the proportion of mariners able to consume information via these channels is well below desired levels, and this present 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 to 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 reuse most 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 extensive work to implement e-Navigation by national AtoN authorities particular Canada, Norway, The Republic of Korea, and Sweden in cooperation with International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) it has become increasingly clear that 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;

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

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 use these services.

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 Standard.

10. As an example, in Canada, the Canadian Coast Guard, Canadian ports, pilotage authorities, and the Saint 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 vessel operators. Arising from an informal survey in 2019 of vessels operating in Norway’s waterways, the Norwegian Coastal Authority (NCA) observed that not all vessels with ECDIS could display ASM, creating 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 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 challenge. 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 and next steps**

15. In light of agenda Item 16 NCSR 9 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;

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.

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.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-2)
2. Leave open if uncertain [↑](#footnote-ref-3)