**Input paper: [[1]](#footnote-1)** ARM20-6.2.4

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

(Select as appropriate)

ARM  ENG  PAP **☑** Input

ENAV VTS  Information

**Agenda item** [[2]](#footnote-2) 6.2

**Author(s)/Submitter(s)** CHINA MSA

Proposal for Organizing Categories of AtoN change information in S124 and S125

# Summary

This input paper proposes optimizing the classification of AtoN change information in S124 and S125, specifying which data should be published simultaneously through S124 and S125. It suggests unifying AtoN information categories across both standards for timely dissemination. Additionally, it recommends adopting these changes in S125 revisions to improve navigation safety and efficiency.

## Purpose of the document

The ARM Committee is invited to consider incorporating the relevant suggestions into the future revisions of the S125 product specification.

## Related documents

1. IHO S125 maritime navigation service
2. S-124 Navigational Warnings

# Background

During the ARM-19th meeting, the summary report of the 2nd Joint IHO/IALA Workshop on S-100/S-200 pointed out that AtoN change information that is time-sensitive and strongly related to ship navigation aligns with the existing definition of Maritime Safety Information (MSI) and should be published through the S124 product. At the same time, the S125 product should include all changes to AtoN change information (including Advance Notice of Change (AC), Proposed Change (PC), Temporary Change (TC), and Discrepancy (DC)), meaning that certain AtoN change information needs to be published simultaneously through both S124 and S125 products.

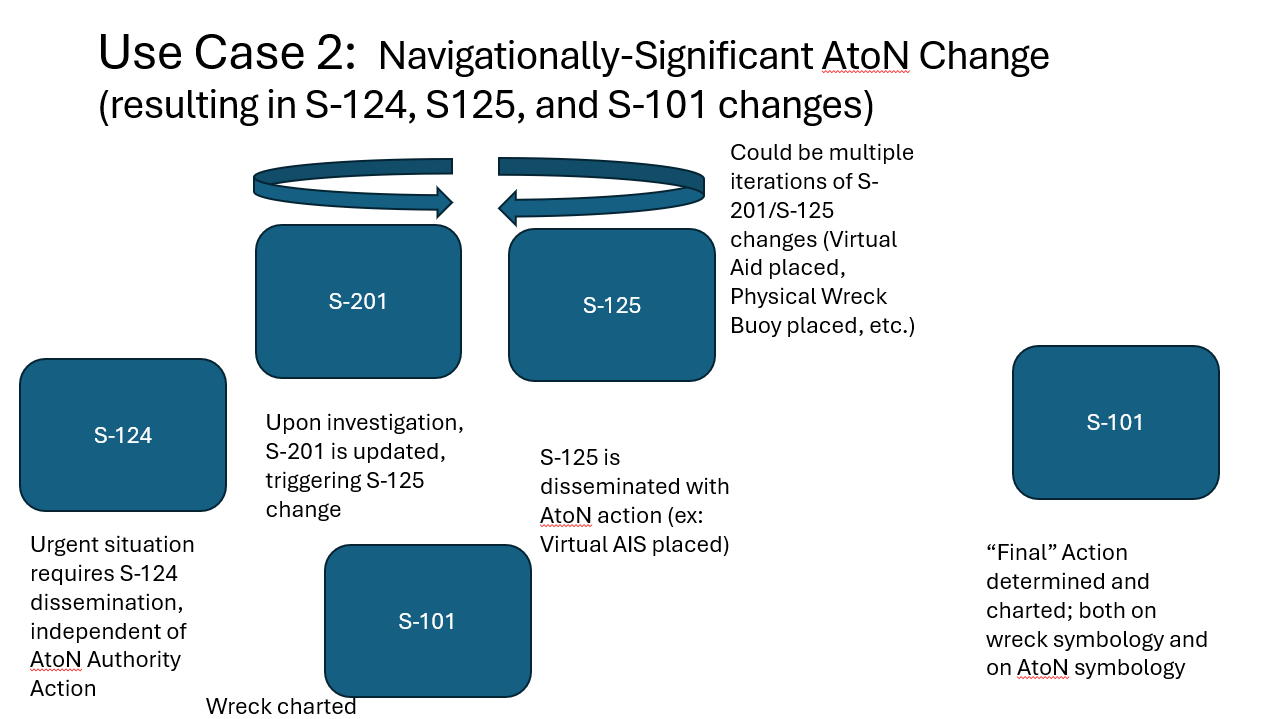
However, the current S124 and S125 product specifications do not clearly define or delineate which AtoN change information needs to be published through both channels. This poses challenges for maritime safety authorities when providing related services in the future.

# Discussion

## Consensus on AtoN change information Services

The IHO-Singapore Lab with KRISO, the Canadian Coast Guard, Singapore MPA, Bluemap and Suresoft, organized a test platform to test the potential of S-124 Navigational Warning and S-125 AtoN Information interaction within a navigation environment. The test platform demonstrated that S-124 and S-125 can work together effectively to provide enhanced information to end-users.

Currently, international organizations and experts from relevant hydrographic agencies have reached a consensus that navigation-related, time-sensitive AtoN change information should be published through both S-124 and S-125 products. The content in S-124 and the AtoN information in S-125 may overlap, but they remain independent of each other.



1. Use case diagram of AtoN change information

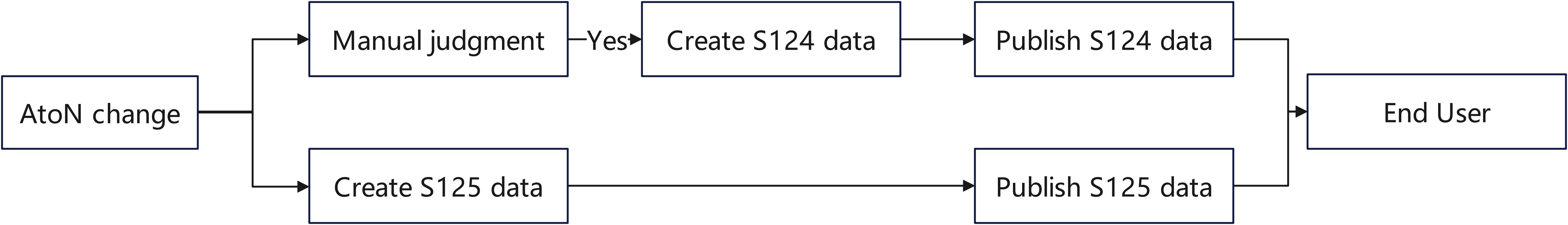
## Existing Issues

Time-sensitive and navigation-critical AtoN change information (such as light buoy malfunction, temporary changes to buoys, unreliable light signals, etc.) needs to be published simultaneously through both S-124 and S-125. The core idea behind the consensus are：

1. S-124, as the primary carrier of Maritime Safety Information (MSI), is responsible for quickly disseminating urgent or temporary risk warnings to mariners.
2. S-125, as the standardized data for AtoN services, needs to comprehensively record the lifecycle changes of AtoN, including advance notices of change, temporary changes, etc.

Although there is a consensus that navigation-critical and time-sensitive AtoN change information should be published through the S-124 product, the current S-124 and S-125 product specifications do not clearly define which types of AtoN change information fall into this category. This creates obstacles for maritime safety authorities when providing AtoN change information services and may lead to the following issues：

1. Ambiguous Classification Boundaries: The Navwarn Type Details enumeration list in S-124 contains nearly 100 AtoN-related types (e.g., "Beacon Daymark Unreliable," "Front Beacon Unreliable"). However, these do not align with the AtoN change information categories in S-125 in terms of naming and scope. For example, "Front and Rear Lights out of Synchronization" in S-124 does not have a direct counterpart in S-125, which may result in incomplete information transmission through S-125.
2. Operational Redundancy and Omission Risks: Maritime safety authorities need to rely on manual judgement to determine which dynamic information should be published through both S-124 and S-125. This can lead to omissions or delays due to ambiguous classifications, potentially affecting navigation safety. For instance, if a temporary AtoN malfunction is not explicitly listed in the S-124 enumeration, it might only be published through S-125, missing vessels that rely on S-124 for emergency alerts.
3. Interoperability Gaps: Differences in the data models of the two standards hinder the collaborative application of S-124 and S-125, making it difficult to automate the association and validation of dynamic information. This increases system integration complexity and may reduce the overall efficiency of information dissemination.

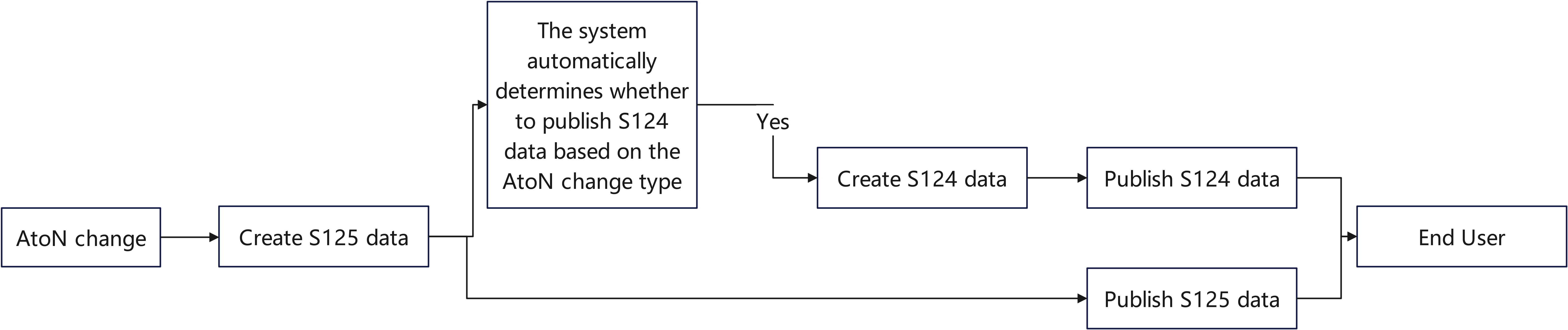


1. Current AtoN change information data work process

## Suggestions for Organizing AtoN change information Categories

Currently, the definitions and boundaries of which AtoN change information needs to be published through the S-124 product are unclear. Additionally, the Navwarn Type Details in S-124 do not correspond one-to-one with the AtoN change information types in S-125. To address this issue, we propose the following suggestions:

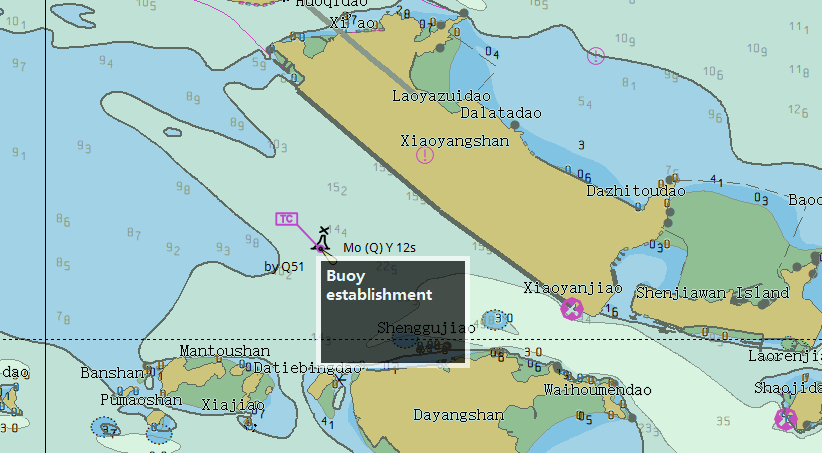
1. Clarify Classification Boundaries: Establish a one-to-one correspondence between the AtoN change information categories in S-124 and S-125, defining clear criteria for "time-sensitive, navigation-related" information. For example, bind "Buoy Re-established" in S-124 with "Buoy Re-establishment" in S-125 to ensure semantic consistency.
2. Clarify Publication Rules: Specify that if an AtoN change information type exists in the Navwarn Type Details enumeration in S-124, it must be published through both S-124 and S-125. Otherwise, it should only be transmitted through S-125. This would eliminate the need for manual judgment by maritime safety authorities, improving data publication efficiency and accuracy.
3. Enhance Interoperability: By unifying classifications, promote compatibility between S-124 and S-125 at the data model level, laying the foundation for future interoperability.



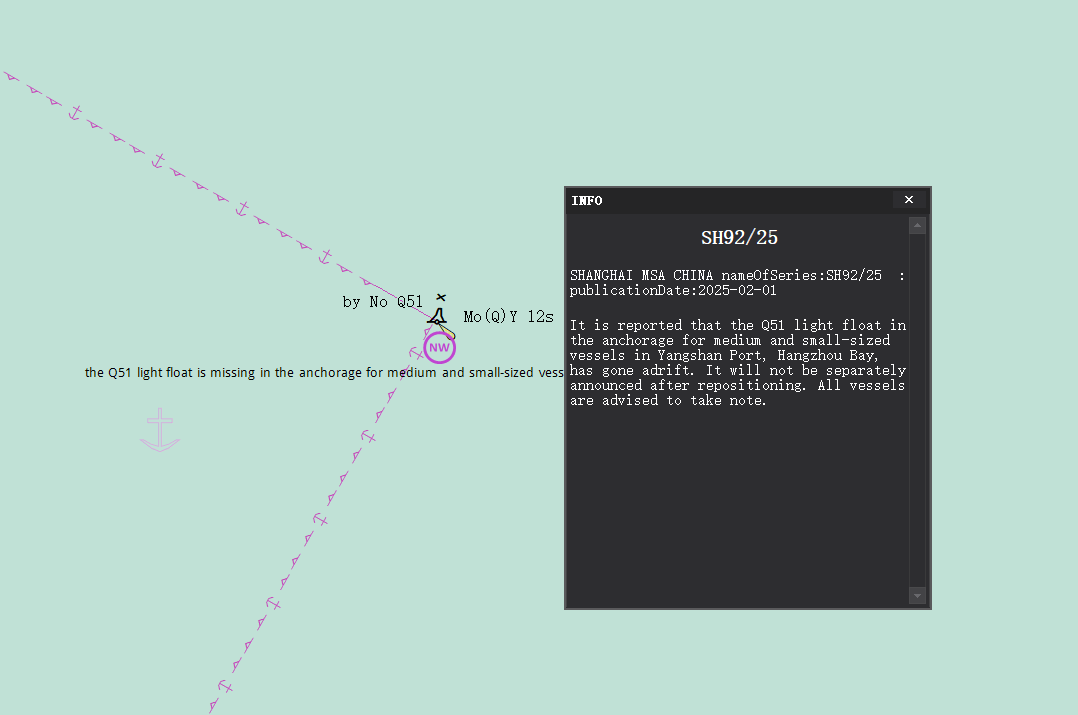
1. Ideal AtoN change information data work process

Through the new AtoN dynamic data publication process, we can smoothly and promptly publish AtoN dynamic data through both S-125 and S-124.

For example, when the Q51 buoy in the small vessel anchorage of Shanghai's Yangshan Port went missing, the AtoN management department first created S-125 data. Simultaneously, the AtoN system automatically determined that S-124 data needed to be sent based on the AtoN change type of this event. The data was then uploaded to the navigational warning department, which created and published the S-124 data. As a result, the information about the missing buoy was disseminated through both S-125 and S-124. Throughout this process, the need for manual judgment was eliminated, significantly improving the timeliness of S-124 data.



1. Display of Q51 buoy missing in S-125 data on ECDIS



1. Display of Q51 buoy missing in S-124 data on ECDIS

# References

1. Report of the 2nd Joint IALA/IHO workshop on S-100/200

# Action requested of the Committee

The Committee is requested to:

1. Note this paper;
2. Consider our suggestions on organizing the categories of AtoN change information, and adopt the relevant suggestions when revising the S125 product specification.

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