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

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Agenda item [[2]](#footnote-2) 8.4

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Author(s) / Submitter(s) China MSA

Portrayal Requirements of the S125 Graphical User Interface

# SUMMARY

This paper, based on the practical application of S125 on ECDIS, in conjunction with the expected service modes of S125, presents suggestions for graphical user interface portrayal requirements when applying S125 on navigation terminals such as ECDIS/ECS.

## Purpose of the document

This proposal aims to further promote the revision of the S125 product specification through sharing China’s experience in practical application test of S125 on ECDIS.

## Related documents

1. IHO S125 maritime navigation service 0.0.3
2. Marine Aids to Navigation (AtoN): Technical Specification for the Provision of AtoN Information Service to End-users

# Background

At the ARM 18th meeting, China Maritime Safety Administration (MSA) proposed the ‘Proposal for Displaying of S125 Updated Data on ECDIS When AtoNs Reverted Back to Design State’. The working group reviewed and discussed this proposal during the meeting. It was clarified that this new dialogue window would be in addition to the already defined S124 dialogue window in IHO S98. It was agreed that requesting a revision for S98 will be the way to go for the envisioned new dialogue window. The working group commended China Maritime Safety Administration (MSA) for their efforts on this proposal and requested further research by China MSA on the S125 graphical user interface.

In the 2023-2027 project planning, IALA also intends for the ARM working group to continue collaborating with the IHO NIPWG working group on the development of the S125 Product Specification and to expedite the release of S125 version 1.0. In response to the project content of the ARM working group, China MSA have conducted further research on the graphical user interface requirements for S125.

# discussion

## Current State of S125 Portrayal

In the S125 Product Specification, the portrayal catalogue includes a symbol set and symbol instructions for the feature and attribute combinations. Under the current S125 portrayal, the symbol display in the overlay layer of S125 on the navigation terminals has been considered but no corresponding standard requirements for the graphical user interface. Obviously, the current state does not fully address the comprehensive needs of users for the S125.



1. Symbols of S125 Portrayal

## Requirements of the S125 Graphical User Interface

The S125 dataset primarily describes the list and status information of AtoNs, such as temporary changes, proposed changes, etc. Derived from the complete AtoNs information, this dataset serves as publicly-accessible information for ECDIS/ECS. Namely, the S125 dataset represents a digital counterpart of an expanded list of lights, covering all or most buoys, beacons, and virtual AIS，which aligns with IMO SOLAS V requirements, mandating the presence of a list of lights and fog signals on board vessels. The primary objective of the S125 product is to supersede the traditional nautical publications known as 'List of Lights and Fog Signals'. Consequently, the S125 dataset is expansive and exhaustive in nature. As to crews, their primary focus lies on data pertaining to their current planned route or the immediate vicinity of their vessel. To facilitate efficient utilization of the S125 dataset by the crews, the graphical user interface (GUI) must possess the following key functions:

1:Data Overview

The graphical user interface should enable users to quickly view the ID, status, and other key information of all AtoNs, while detailed information about an AtoN should only be displayed upon request for a deeper understanding.

2: Data Sorting Function

Given the vast amount of data in the complete S125 dataset, users should be able to sort the S125 data list based on proximity to the vessel or other criteria, to prioritize viewing the most relevant information and reduce the interference caused by data that is less relevant to the vessel's journey.

3: Data Filtering Mechanism

During navigation or route planning, crew members should be able to conveniently filter the S125 data relevant to the current route for safety alerts and reference in route design.

4: Update Notifications

Users should be clearly informed of data updates through the interface, so that they can quickly notice and take corresponding actions after the data is updated.

5: Service Configuration Options

According to the draft of IALA's 'Marine Aids to Navigation (AtoN): Technical Specification for the Provision of AtoN Information Service to End-users’, S125 services are expected to be provided as online services. It is anticipated that these services will be offered in two ways:

* Pull Mode: After obtaining authorization, ECDIS/ECS navigation terminals will actively pull data from the service provider's interface.
* Push Mode: ECDIS/ECS navigation terminals will subscribe to the S125 services provided by the service provider, automatically receiving updates as the data is pushed by the provider.

Therefore, it is necessary to include service-related settings functions in the S125 user interaction interface. This inclusion will enable users to conveniently subscribe to or unsubscribe from services, check the current service status provided by the service provider, and perform other related tasks.

With these features, the graphical user interface of the S125 dataset will be more intuitive and efficient, helping crew members make more accurate navigation decisions in the complex maritime environment.

## Testing of S125 Graphical User Interface

### S125 Data List

The dialog should display the latest list of S125 data, which includes all the AtoN data from the current version, showing information such as AtoN ID, name, and status.



1. The Dialog of S125 Data List

The default sorting of the S125 data in the dialog should be based on AtoN ID. Users can change the current list order by clicking on the sorting type. For example, users can choose to sort by the distance between the AtoN and the vessel's current position, or by the AtoN information's publication date, among others.



1. S125 Data List - Sorting Change from Default to Distance from the Vessel

In the data list dialog, users should be able to clearly see important information such as the current version, latest updates, and publication dates of the S125 data which helps users easily understand the overall status of the current S125 data.



1. The Dialog Displaying the Version and Publication Date Information of the Current Data

### Display of Information Details

When a user clicks on an AtoN item in the S125 data list, the system will pop up an AtoN data details dialog and automatically move the chart to the actual location of the AtoN. Additionally, users can display the AtoN information details dialog by clicking on the S125 symbol in the S125 data overlay layer.



1. The Display of S125 Information Details

In addition to viewing specific information of AtoN, the information details dialog should also display the historical update log of the AtoN information.



1. S125 Data Update History Log

### Data Filtering

To avoid overwhelming the ECDIS with excessive symbol information and to reduce the cognitive load for the crew, we can implement filtering options for displaying S125 data. For example:

* Display only AtoN with abnormal status.
* Display S125 data relevant to the current planned route.
* Display S125 data within a specific, predefined area.

1. Filter S125 Data to Display Only Abnormal Status



1. Filter S125 Data to Display Only Data around the Planned Route

### Data Update Notification

When S125 data is updated, the AtoN item in the data list should be highlighted with a specific color to indicate the update. Once users have clicked the updated item, the color should revert to normal. This notification system helps users quickly identify and review recently updated S125 data on the ECDIS.



1. Updated AtoN Items Highlighted in Red

## Portrayal Requirements of the S125 Graphical User Interface

In the S125 Product Specification, the portrayal of S125 is provided by a portrayal catalogue that includes a symbol set and symbol instructions for the feature and attribute combinations. It’s believed that a dedicated graphical user interface is necessary to facilitate user interaction with S125 data. Although the specific appearance of the graphical user interface may vary among ECDIS, ECS, and other navigation terminal manufacturers, the interface should at least include the following functions:

1. Data List Functionality: Provide a complete list of all S125 data, which should at least display information such as the name and status of AtoN. Furthermore, users must be able to sort the list based on different options, such as distance or the date of the last update of the S125 data.
2. Version and Publication Date Information: Clearly indicate the current version and publication date of S125 data on the graphical user interface.
3. Data Filtering Functionality: Provide robust filtering options for S125 data. Users should be able to filter data based on AtoN status, relevance to planned routes, selected regions, etc. The default setting should be no filters.
4. Data Update Notification: Provide notifications for data updates. Notifications should remain visible until the users confirm they have viewed the updated data.
5. Service Settings: Provide settings related to S125 services. Users should be able to configure service settings, including setting the service API address, subscribing to or unsubscribing from services, and viewing the current service status.

During the review of the current S125 product specification, it’s noticed that Chapter 13, titled ‘Portrayal’, has not yet incorporated the portrayal requirements specific to the graphical user interface (GUI). Given the crucial role of the user interface in enhancing user experience and facilitating effective communication, China MSA recommend incorporating design and functional requirements for the GUI within Chapter 13 during the upcoming revision of the S125 product specifications, which not only guarantee that the S125 dataset is comprehensive in its content, but also meet the standards of efficiency, intuitiveness, and user-friendliness in terms of user operations and data presentation. In this way, China MSA can further refine the S125 product specifications to better cater to the actual needs and operating preferences of users.

# References

1. IHO NIPWG9-05.1A Rev1
2. Report of the Joint IALA/IHO workshop on S-100/200 development and portrayal

# Action requested of the Committee

The Committee is requested to:

1. note the suggestions in this paper;
2. and take actions as appropriate.

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