

## 1. Background:

Requirements for Manual Corrections are currently defined in S-52 and S-98 Annex C (C-12.6.4, C-12.6.5). This applies to ENC S-57/S-101 (C-12.6.4) and other products like S-102, S-104 (C-12.6.5). In particular it includes the requirement that “Manual updates of ENC information should be displayed using the same symbology as ENC information”. This approach:

- a. Does not go in line with Clause 1.5 IMO MSC.530 (106) “ECDIS should reduce the navigational workload compared to using the paper chart and paper nautical publications”. Manual Correction functionality according to current S-52 does exactly the opposite. For example, minimum 10 attributes to display beacon/buoy correctly. Compared to paper charts practices it would take 5-10 times longer depending on ECDIS make and model. In addition, such approach implies that changes are ENC cells - based which would multiply the efforts to cover e.g. both Approach cell and Harbor cell affected by the same changed conditions.
- b. Does not go in line with Clause 4.5 IMO MSC.530 (106) “ECDIS should also be capable of accepting updates to the ENDS data entered manually with simple means for verification prior to the final acceptance of the data. They should be **distinguishable on the display from ENDS information and its official updates** and not affect display legibility”. Use of the same symbology can lead to easy misinterpretation. Small orange symbol to identify that object belongs to manual correction can be easily overseen.
- c. No longer a necessity. ECDIS Connectivity is a mandatory requirement from now on supported by development of timely (e.g. daily updates). Availability of services like UKHO ADDS and availability of S-124 data services will eventually eliminate the need of manual correction in its “classical” way that used to be done on a paper chart and in early days of ECDIS.
- d. Can lead to drastic information misinterpretation of ECDIS user side. Functionality allowing a user without hydrographic background to manipulate official data both ENC S-57/S-101 (C-12.6.4) and other products like S-102, S-104 (C-12.6.5) may lead to a loss or incorrect/ambiguous display of navigation safety related official data.
- e. Adds unnecessary complexity to the concept of S-100 ECDIS with its dynamically loaded/processed FC, PC, IC....

In general: 2<sup>nd</sup> quarter of 21<sup>st</sup> Century with today’s and expected in the near future level of ship’s connectivity and recent technological benefits of electronic navigation leave NO ROOM to the practice of extensive Manual Correction for charts or any other digital products delivered from Official Hydrographic Offices. Imagine doing chart corrections on your car navigation system! This shall be history from now on for ECDIS.

## 2. Proposed Functional requirements (For S98 Annex C) – currently C-12.6.4 and C-12.6.5.

ECDIS must NOT allow any correction or modifications to official hydrographic data by user.

Instead ECDIS must support functionality to temporary annotate changed navigational conditions in a simple and timely manner, minimizing mariner’s workload. This capability shall cover the possible gap between the moment of crew awareness on changed conditions

(e.g. via received NAVTEX message) and arrival of official updates from the relevant HO reflecting the same change.

This includes:

- In built editor for Manual Updates overlay.
- Support of limited number of predefined symbols and linestyles that are deliberately different from ENC or any other official data symbology and display rules. *Note: For the portrayal, a generic spec (like in IEC62288 for targets) should be sufficient. It may be fixed in S-98 Annex C (preferred). A separate special FC/PC does not seem to be necessary, but technically feasible.*
- Can be displayed together with and independently from any underlying ENC or other official data, originated by HOs.
- Support of point, line and area objects with Information and display text attribute to support quick access to information source e.g. Reference to NAVAREA message and nature of changed navigation conditions, as considered necessary by the mariner.
- In addition, support of danger and minimum depth value attribute for optional entry by the mariner to insure automatic antigrounding functions as per IMO requirements.
- Deleted objects (after navigation conditions changed back to normal and/or official updates delivered including by S-124) shall be kept in ECDIS database for 90 days and should be able to be called for review (and export).
- Manual Updates with set danger or minimum depth value attributes must always be displayed irrespective of selected chart layers and interoperability level. Other manual update objects must be displayed as part of Standard Display.
- Manual Updates objects are to be displayed on scales 1:500000 and larger.
- Objects of Manual Correction layer shall be monochrome and displayed in distinguishable colour (e.g. NINFO).
- Deleted objects called on display for review must also be monochrome and distinguishable by a different colour. Date of entry and removal must be accessible to the user, e.g. by Pick report.

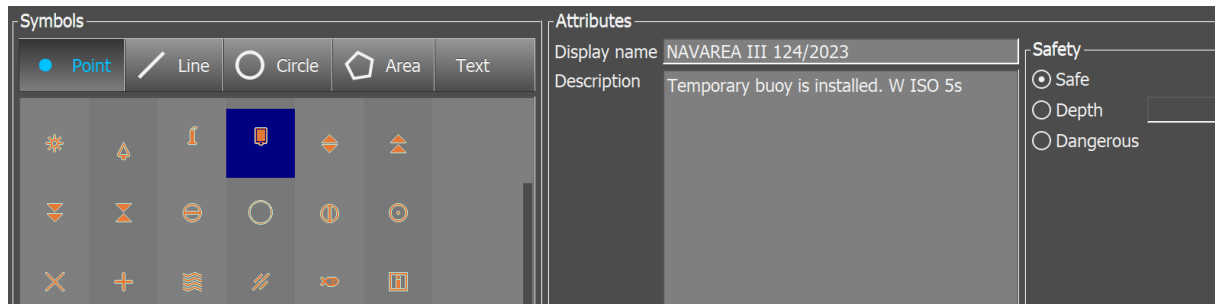
### 3. Tests in S-164:

Create test scenarios around 3-4 example of NAVAREA or T&P NtM to check that:

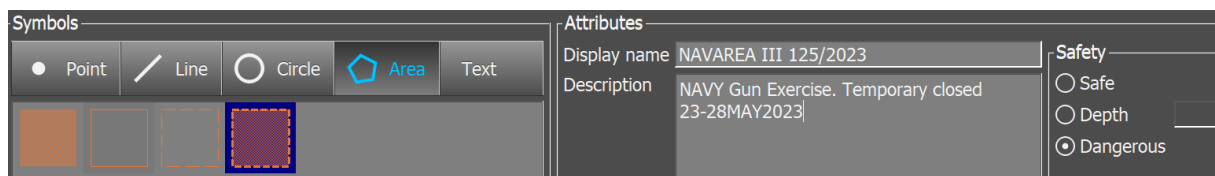
- Objects can be entered by both location of pointer device on the screen and series of coordinates.
- Attributes (text, inform, danger, minimum depth) are available for optional entry by Mariner and considered in both route planning and monitoring functionality.
- Manual Updates Objects can be easily deleted.
- Deleted objects must stay in ECDIS database for 90 days and may be called on display for a retrospective review and export for further evaluation (including date of entry and removal).
- Change of underlying official data (e.g. loading of smaller scale ENC cells while changing display scale) shall not affect the display of Manual correction Objects.
- Manual Correction objects must not be displayed on display scale smaller than 1:500000.

#### 4. Examples of possible implementation:

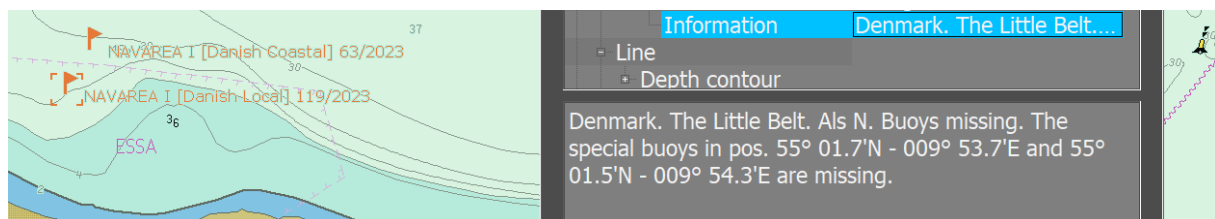
##### 4.1 Points object library and attribute entry:



##### 4.2 Area object library and attribute entry



##### 4.3 Display in Monitoring mode and Pick report content



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