S-102PT 19-2.0

Paper for Consideration by S-102PT

A method for displaying safety contours in the S-102 product based on a colour scheme

Submitted by:	China MSA
Executive Summary:	Safety contours, as a key feature for navigation, can be portrayed in both S-57/S-101 ENCs. However, the safety contours is not presented in the S-102 product. In order to be in accordance with the safety contours in S-57/S-101 ENCs, as well as enhance the continuity and harmonization of the presentation in the interoperable scenario within the S-1XX products, specifically when the interoperability level is 0, a method for displaying safety contours in the S-102 product based on a colour scheme is proposed.
Related Documents:	S-52(4.0.3);S-102 (2.2.0)； S-98(1.0.0)draft
Related Projects:	S-102PT; S-164/S-98 Sub-Group

Background

In S-52 (6.1.1) "Specifications for Chart Content and Display Aspects of ECDIS ", the safety contour is identified by a 0.6mm thick grey line. In the S-101 Portrayal Catalogue (1.2.0), the visualization of the safety contour is double coded by a thick grey line and a prominent change in depth shade. Whether in S-57 or S-101 ENCs, the safety contour is selected from the existing contours and expressed with a conspicuous grey line, without extracting new line features.

In the S-102 PS 2.2.0, it is described," the addition of an S-102 dataset enhances the mariner's ability to render and display, using colours, and higher resolution depth zoning directly from the grid. At time of ingest a display system will delineate and display navigational depth zones by comparing the depth layer of the S-102 datasets to the mariner-defined vessel draft or default safety contour". It doesn't mention the presentation of the safety contour.

Discussion

According to S-98, with the addition of S-102 data, the ENC will be covered by the S-102 data coverage. When the interoperability level is 0, the safety contours from ENCs appears to be interrupted at the border of S-102 product, as S-102 product does not display safety contours, which creates a discontinuity to some extent, as shown in Figure 1.

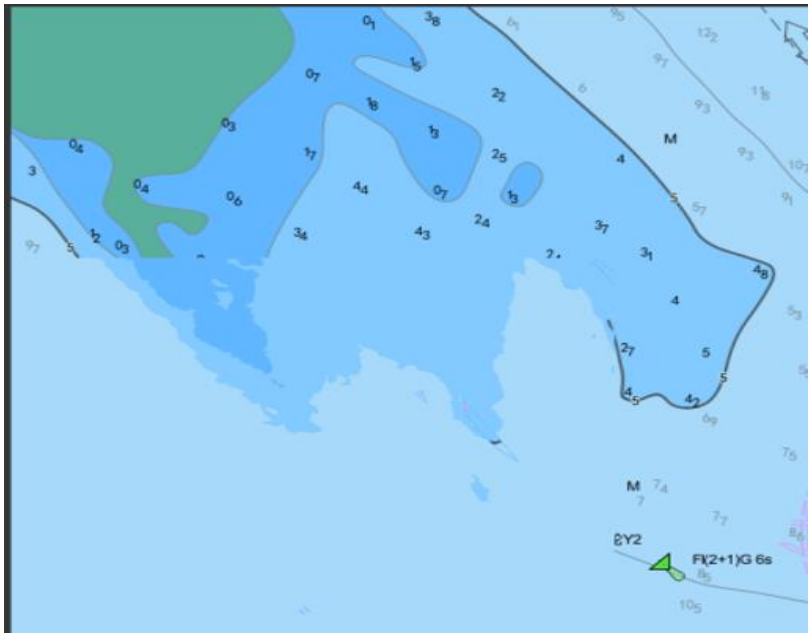

Figure 1 The display of S101+S102 data when the interoperability level is 0

During the production of S-1xx products and the interoperability test within them, China MSA conducted a method for displaying safety contours based on a color scheme. Presenting of the safety contours by such coloring method is based on algorithms, and three conditions have been tested. The first is when S-102 is used independently, the second is when S-102 is used with S-101 while the interoperability level is 0, and the third one is when WLA is considered.

The coloring method does not require additional storage procedures, as it processes the coloring in real-time during the raster drawing stage, primarily based on the relationship between the current grid point and its neighboring grid points. As shown in Figure 2, this method can maintain good visual effects even at larger display scales. When implementing S-98 interoperability, the system does not need to generate two separate temporary datasets (safety contours and contours), and during the process of WLA, it can support the rapid dynamic changes of both the safety contours and contours. The performance verification shows that this method ensures efficient data processing and good visual presentation.

It can been seen from fig.2, with the adoption of this method, the presentation of safety contours in S-102 are in consistent with those ones portrayed in ENCs, appealing to be visual pleasing and the continuity is also enhanced. The other advantages are as follows:

- High display speed.
- Generating a seamless, linear effect that is visually pleasing.
- No need to generate additional datasets or perform data management, greatly simplifying the complexity of the interoperation process.
- It facilitates the release and application of dynamic data services, theoretically, the web end requires little data processing, making the data application relatively simple.

Figure 2 Safety contours shown by colouring method

Recommendations

This document provides a method for displaying safety contours in the S-102 product based on a color scheme. And the mechanism is similar to the ones for generating navigation depth zones within the S-102PS. The display of safety contours is also consistent with the ones defined in S-101 (referring to the S-52 standard). All above indicates that the display of safety contours in the S-102 product is easy to implement and the display performance is well and acceptable. Therefore, in addition to the description of using a color scheme to display navigation depth zones in the S-102 product, it is proposed that the display of safety contours to be added in the PS.

Action Required of S-102PT

The S-102PT is invited to:

1. note the recommendations in this document.
2. consider whether the safety contours should be presented and be specified in the subsequent product specification.