

Paper for Consideration by HSSC

Guidelines for ENC derived Paper Charts

Submitted by:	United States (NOAA)
Executive Summary:	Proposed guidelines for automated paper chart output from ENC
Related Documents:	HSSC13-5.4B, NCWG7-6.7B, HSSC12-5.4C
Related Projects:	Any related projects that may impact upon considerations

Introduction / Background

The IMO considers paper nautical charts to be an adequate independent back-up for ECDIS. Recognizing that the information and capabilities of ENC and ECDIS have surpassed that which can be captured on a sheet of paper and that it is impractical to attempt to automate a paper reproduction following existing cartographic IHO standards of all information available on an ENC, we must consider a minimum guideline for those who wish to continue to rely on paper for route planning, situational awareness, and backup navigation. Unified symbology is key to ensure a safe transition from ENC to paper in the event of system power failures. Some Hydrographic Offices already have plans to use this technology in a national context. In order to ensure maximum uniformity for global shipping, the IHO can play a role in developing guidelines for automated paper chart output.

Analysis/Discussion

Member States are starting to offer ENC data that is presented at a scale that is too large for presentation on paper, and the possibilities for electronic information in the S100 era quickly invalidate the possibility of mirroring all capabilities on paper. It is also reasonable to assume that there are a variety of options for a back up to ECDIS that do not include paper, including laptops, tablets, smartphones, and possibly an A0 sized screen to show a full sized ENC driven automated image output. As part of our obligation to keep paper options easy to manage, budget conscious, easy to produce, consistent with ENC data, and safe for limited navigation, a minimum paper chart guideline is needed.

A version of this paper was presented at HSSC12, however, due to the condensed nature of the meeting it was deferred over to the Nautical Cartography Working Group for consideration as part of its Future of the Paper Chart. Recognizing that in that same report NCWG recommended that there wasn't a need to develop a separate specification for simplified or back-up nautical charts at this time and that much of the work was focused on creating a "Common IHO Baseline Symbology", the United States still recognizes a need for a simplified specification on how to automate and print paper chart output from ENCs .

The United States has increasingly recognized that there are two parts to developing paper charts derived from ENC data. The portrayal aspects are being dealt with in part by the NCWG Baseline Symbology Project Team, but there is also the aspects that deal with printing the chart to be usable for backup and situational awareness that may be considered. For example, if the output scaling is incorrect or if it is printed at a reduced scale this can lead to a chart derived from an ENC that while looks like a chart is still misleading to the mariner due to the lack of critical information, e.g., buoy characteristics.

Proposed Properties of an automated paper chart output from ENC.

The specification should, for the most part, allow official hydrographic offices to determine which features must be included and the quality to which they are printed. However, some basic guidelines should be recommended to ensure a safe ship movement for route planning, situational awareness, and backup navigation . This list is a set of examples, not considered comprehensive or all mandatory.

- 1) Should include a blue tint at a depth threshold relevant to the vessel using the chart
- 2) Must include a compass rose or north arrow that indicates magnetic variation
- 3) Must include scale bar and graticules appropriate for use with a GPS and visual and/or radar lines of position

- 4) Must be red light readable
- 5) Must include soundings, contours, wrecks, obstructions, and other hazards to navigation
- 6) Land areas, elevation points, navigation aids, and waterways should be labelled with name and relevant characteristics for navigation
- 7) Notes, titles, authorities, print dates and metadata may be printed outside the neat line
- 8) Charts should include a print date and should be updated with all hydrographic office updates at time of printing
- 9) Charts should include a specific intended use for example, "this chart suitable for route planning, situational awareness, and backup navigation and should not be used as a primary navigation tool."

Hydrographic offices and national authorities may choose to add requirements for automated paper chart output from the ENC.

Conclusions

The investments made by Hydrographic Offices to provide data and technology that cannot be captured on paper, coupled with the trend to prefer ENCs as the product of choice for navigation, indicate that it is time to reduce the burden on mariners and hydrographic offices with regard to paper charts. In many cases, paper charts that are not fully up-to-date now have a backup role and are less safe than ENCs. A key step toward this is providing a minimum set of guidelines to produce paper charts directly from ENC data.

The United States is willing to lead the guideline development effort as it is in the process of cancelling its entire paper chart suite by 2025 and is investing in tools to create paper charts from ENC data, and has recognized that without an appropriate guideline it cannot move forward with the ability to reliably allow its users to create custom charts for route planning, situational awareness, and backup navigation.

Recommendations

It is recommending that the IHO consider supporting the work proposed by the United States in producing an addendum to the work that is being done by the Baseline Symbology Project Team to also take into considerations on the specifications that are need to print the results for backup and situational awareness.

Justification and Impacts

These new criteria would can provide the basis of a specification that can lead to successful printing of paper charts derived from ENCs.

Action Required of HSSC

The HSSC is invited to:

- a. note this Paper;
- b. endorse, the need for specifications relating to printing ENC derived paper charts.
- c. Ask NCWG to continue to focus on the Baseline Symbology Project Team work and accelerate where possible.
- d. Consider the proposal from the United States to lead the effort on the guidelines required for printing paper charts derived from ENCs