

**Paper for Consideration by NCWG
Recommendations for Baseline Symbology Project Team**

Submitted by:	United States (NOAA), Republic of Korea (KHOA)
Executive Summary:	To encourage an expedited plan for agreeing on symbols and uses for automated paper chart production
Related Documents:	NCWG Work Plan (page 28 of HSSC 2020-2022 Work Plan) S-4, IHO INT Chart Regs and Chart Specifications NCWG The Future of the Paper Nautical Chart Final Report
Related Projects:	

Introduction / Background

The NCWG established a Baseline Symbology Project Team to develop an agreed upon set of symbols for automated S-101 paper chart production from ENC data. The Future of the Paper Nautical Chart Survey, conducted in 2019, showed that over 70% of the responding IHO Member States indicated that they have either started automated production or are exploring ways of creating paper charts from S-57 ENCs. There is an increasing need to have an agreed upon set of international symbols and rules for use in automated production. Some hydrographic offices could make use of the work now, if it were available.

Analysis / Discussion

There is an excellent opportunity for the world to take advantage of new technology to automate much of the creation of paper charts. This will enable an increased capacity for hydrographic offices to concentrate on building S-57, S-101, and other datasets that the shipping world will require in the future.

NOAA recommends the Project Team consider the following as it moves forward with completing NCWG Work Plan Item E11 to “Develop baseline symbology to support automated chart production.”

- Be Expedient

Many Member States have already started, or plan to start, automated paper chart production using S-57 data. The world would be well served by an agreed upon set of digital symbols and portrayal rules, available freely to all Member States, to use in existing production systems and the S-101 systems of the future. The concept of standard digital symbology and automated chart production was discussed at HSSC11 in May 2019,¹ and at NCWG5 in November 2019.² Despite the formation of a Project Team and a virtual team meeting being held in March 2021, other tangible progress has been slow appear. We encourage NCWG and the Project Team to drive forward with renewed purpose to build upon automation progress that has already been made by some industry partners and Member States so that others may take advantage of these resource and time saving capabilities as soon as possible. A prototype of some nature should certainly be available to share by the autumn of 2022.

- Be Flexible

We encourage the Project Team to be flexible and open to new ways in which data might be presented on paper charts that are created automatically from ENC data. For the most part, an automated paper chart and the baseline symbology created to support it should be familiar to paper chart users. However, there may be features for which the “traditional” S-4 portrayal may be difficult to automate, but for which a different – and equally comprehensible – representation might be acceptable. Thus, there are likely to be occasions where trade-offs must be considered between nostalgia for the “beauty” of traditional paper charts verses the efficiency of using an automated process to create an equally functional product

¹ [HSSC11 action 11/48](#), “NCWG to anticipate the need to consider the proposals made at HSSC11 on the automated production of paper charts from ENCs at its next meeting.”

² [NCWG5 minutes](#), agenda item 6.1A, subsection, “Production of paper charts from ENCs,” and agenda item 6.5, “Automated production of paper charts from ENCs.”

- Be Pragmatic

The project Team should take advantage of existing S-57 ENC data and S-57 related automation efforts. At NCWG5, the working group discussed various aspects of how paper chart automation might be carried out. At that time, the use of S-57 to S-101 ENC converters and the possibility that NCWG focusing on the automation of S-101 ENCs might “speed the transition to S-101” were mentioned. While automation of S-101 ENCs should certainly be considered, NOAA believes that challenges still remain for HOs to convert existing S-57 data and for HOs to create native S-101 data directly. Waiting for resolution of these S-101 issues, conversion training, and the configuration of the necessary software will surely delay any useful outcome of the Project Team to provide a means for HOs to start automating the production of paper charts from the plentiful S-57 data that they already have on hand. There is literally a planet’s worth of S-57 ENC data that could yield automated paper charts and several HOs that already have S-57 based paper chart symbolization rules. NCWG should move forward with facilitating automatic paper chart production of S-57 ENC data first. This will provide valuable lessons for the eventual automation of S-101 ENC data.

Conclusions

There is a global need to expedite the work of the Baseline Symbology Project Team. The world is in the process of transforming its approach to paper chart production and would be well served by the NCWG’s prioritization of the Project Team’s work.

Recommendations

- Be Expedient: Don’t delay in digging into the details of work at hand. Strive to produce a prototype or sample output in the next 12 months.
- Be Flexible: Be open to ENC-based automated paper charts looking a little different from classic S-4 specified “traditional” paper charts.
- Be Pragmatic: Create an S-57 ENC data based solution first. Take advantage of the existing S-57 data and S-57 based rules so that HOs may start automating paper chart output now. This will ultimately free resources that could be used to expand ENC coverage and prepare for the eventual transition to S-101 ENC data.

Justification and Impacts

Many paper chart producing nations are ready to start automating the process of ENC-based paper chart production now. Expediting the development of digital symbology and rules to support automation will enhance the capacity of HOs to produce inherently synchronized ENC and paper chart products in a more timely fashion. This will free resources that could better be served creating and improving other data that will enhance the safety and efficiency of commercial shipping and other maritime operations.

Action required of NCWG

The NCWG is invited to:

- a. Adopt the recommendations identified above,
- b. Update HSSC12 of the Baseline Symbology Project Team’s focus, based on the recommendations above,