CHRIS15-5.1A

15th CHRIS MEETING
IHB, Monaco, 10-13 June 2003

PRINTED ENCs
(June 2003)

United States (NOAA)

1. Summary

Executive summary:	Hydrographic offices that make (ENCs) would like to use one production system for all their products. Unfortunately, it is difficult to make traditional paper charts from S-57 databases without substantial additional attribution. Instead, it is proposed that a paper chart be defined that can be made directly from an ENC.
Actions to be taken:	The CHRIS committee is invited to start a work item to develop an IHO standard for a printed ENC that meets chart carriage regulations.
Related documents:	None

2. Introduction / Scope

Hydrographic offices that make Electronic Navigational Charts (ENCs) would like to use one production system and database for all their products: paper charts, raster charts, ENCs, etc. Such a consolidated production system is desirable to keep cost and manpower requirements lower, and to keep all products synchronized.

Reaching this goal is difficult because it is hard to produce a traditional paper chart from an S-57 database. Examples of problems include the placement of text; features that coincide; and items that are on paper charts but not in the S-57 database. Solutions emerging from companies making ENC production systems involve complicated additional software, and/or substantial extra attribution and its maintenance by the hydrographic offices.

To improve this situation, it is proposed that the paper chart be redesigned, or a new paper chart be created and standards written. This "printed ENC" would be designed to be manufacturable directly from an ENC while still providing a regulation-compliant printed product. Thus hydrographic offices would be working the problem of making a single production system both from the system end and the from product end.

3. Analysis/Discussion.

It has been noted that companies making ENC production systems are also trying to make paper charts from those systems. In general, they are following 2 approaches:

- adding additional attributes to the S-57 database that deal with depicting the data for a paper product – additional data that would have to be collected and maintained by a hydrographic office; and/or

- developing additional software using rules bases or artificial intelligence to make depiction decisions – software that would add expense and complexity, and which would be unique to each manufacturer's system.

Both of these approaches substitute a new problem rather than solving the original one.

What makes the problem difficult is our "requirement" to recreate paper and raster charts exactly as they exist today. The problem will be simplified if we are willing to change the charts into something closer to what can be readily made by existing ENC production systems. Such an approach would minimize additional data collection and expensive, proprietary software. Further important gains could be made if paper and raster products were made directly from ENCs rather than the underlying database. This simple but powerful idea has many beneficial consequences for hydrographic offices and for mariners.

The subject is within the scope of IHO objectives. It is not within the scope of a current IHO work program item. Adequate standards do not exist. The benefits justify the proposed action.

4. Benefits.

The benefits of redesigning the paper charts so they could be made directly from ENCs are significant. They would change the business of nautical charting in a fundamental way, and would immeasurably improve the service provided to mariners.

A. The amount of work required of hydrographic offices would decrease, and some of their activities would no longer be needed.
    1. Hydrographic offices could focus on gathering and quality controlling data, and updating their ENC production system database.
    2. Cartography as an art, and the labor it uses, would be minimized. The paper chart would be redesigned to eliminate many cartographic depiction decisions, and the remainder would be rules and conventions in the "ENC to paper" software.
    3. Maintenance for a hydrographic office's suite of products would be reduced to maintenance of the S-57 database only.
    4. The gathering and maintenance of additional attributes dealing with data depiction would be eliminated or substantially reduced.
    5. The goal of a single production system for all products would be achieved, regardless of which manufacturer's system was used. The ENC, in effect, becomes a neutral interface between a hydrographic office's S-57 database, and the manufacture of products.
    6. Hydrographic offices having trouble producing even paper charts would be able to offer a full range of products immediately upon completion of a set of ENCs.

B. Mariners would receive a significantly improved level of service.
    1. Mariners (or their agents) could produce paper or raster charts, ECDIS backup, updates or patches, and printed voyage planning documents directly from their regularly updated ENC. This would improve the timeliness and breadth of information distribution.

2. All of a mariner's chart products would be synchronized. ENC updates would be distributed and all other products could be immediately made or remade.
3. With such an increased value to mariners, and reduced cost for those products they make themselves, uptake of ENCs should increase.
4. Working from the standardized ENCs would provide this same level of service worldwide. Also, the resulting products should be more standard worldwide.
5. Clarity would be provided to mariners as to what is an official or acceptable product. It would be an ENC or any product produced from an official ENC that met the standards for that derived product.

C. ENC system manufacturers would also gain.
   1. System complexity would be reduced. By making ENCs the source of all other products, each manufacturer would be relieved of the need for tailoring his database and software to produce paper charts, and the need to customize that software for each nation's preferred depiction. Manufacturers may choose to make "ENC to paper" software or not.
   2. Since ENCs would now be the product from hydrographic offices, demand for production systems should be stronger.

5. Working Groups.

This task would be appropriate for either CSWG or for TSMAD. CSWG would be appropriate because a new or revised paper chart would be designed. TSMAD would be appropriate because there would likely be changes needed to S-57 and the ENC Product Specification.

Alternatively, a new committee with this as its sole task could be established.

6. Other relevant information.

None provided.

7. Priority.

High.

Hydrographic offices are actively collecting S-57 data and making ENCs. Some data collection decisions have been made that are incompatible with making a paper chart – either from the ENC or from the underlying S-57 data. It is important to establish sufficient information about the "printed ENC" to minimize the amount of data recollection that might be needed.

Additionally, ENC production system developers are making commitments and spending development time and money that could be eliminated if this proposal is successful.

8. Target completion date.

Task the appropriate CHRIS committee working group – June 13, 2003.
Finish the "printed ENC" standard – September, 2004.

9. Action Required.

The CHRIS committee is invited to task the appropriate working group to develop a standard for a carriage regulation-compliant, paper/raster chart that can be made directly from an official ENC. The working group should be advised that they have license to recommend substantial changes in the paper chart in order to make it manufacturable from an ENC. Further, the working group should be advised to minimize or eliminate the need for hydrographic offices to collect additional data for this "printed ENC", and to minimize the changes necessary to S-57 and the ENC Product Specification.