Paper for Consideration by HSSC11

Paper Charts from ENCs – The need for a new standard

Submitted by:	Australia (Australian Hydrographic Office)
Executive Summary:	The development of a new major edition of S-4 (5.0.0) or a brand new S-1xx PS capable of supporting the production of a new looking paper chart directly derived from richer S-57 data and with minimal manual intervention must be addressed as a priority item.
Related Documents:	HSSC11_2019_05.4D, HSSC11_2019_04.2A (Goal 1, target 1.1)
Related Projects:	subWG on the "Future of the Paper chart' (NCWG)

Introduction / Background

With an increasing number of S-100 PS being developed and released for 'implementation and testing', Hydrographic Offices (HOs) must be able to redirect resources to the generation of these new products to support of the IMO's e-Navigation strategy. To facilitate this, the role, look and production mechanism of paper charts must change in order to release capacity. This paper stresses the need for a new charting standard capable of supporting the production of a new looking paper chart that meets current and future requirements, not legacy expectations.

In this context the role of the traditional paper products should also be discussed and a more realistic and pragmatic definition negotiated with the IMO, particularly in the context of use as a backup arrangement. This has the potential to significantly alter the perception of what is considered the minimum level of content appropriate for different purposes.

Analysis/Discussion

It is evident that in order for HOs to embrace the new S-100 products and give mariners better and interoperable data, existing production resources will have to shift focus from products developed to support traditional methods of navigation (paper charts) to a new generation of charting products developed to underpin electronic means of navigation, from ECDIS to Autonomous ships. It is also evident from such things as a comparison of update services for ENC and paper charts that some HOs already struggle with two primary services, let alone the impending prospect of adding a third.

Although different IHO Member States (MS) will embrace this change at different speeds, the IHO must pave the way and develop a new standard that legitimises a new looking paper chart with a different role. This must also include addressing certain key symbols currently used in both ENC and paper charts, but which have dangerously different circumstantial meaning in each, and others where different symbology methods are used to represent the same information.

The AHO also considers that the expectation that paper charts fully replicate the content of an ENC should be reconsidered as part of developing guidance on a minimum level of content. In AHO experience, there has been considerable pressure to increase the scale and level of detail in Harbour and Berthing ENC, significantly beyond anything that could be practically included in a paper replica. ENC and paper charts can therefore already differ significantly in levels of detail.

Further, when the role of a paper chart portfolio as backup to a single ECDIS installation is considered as just one of many systems on a ship that affect maritime safety, it is puzzling that it is not treated in the same way as, for example, the main machinery or steering gear. Currently, there is no specific requirement for a ship to have a main and backup propulsion system, though there is a requirement for some level of backup steering system sufficient to get a vessel to an anchorage or place of assistance. In contrast, paper charts, *as backup,* are still expected to enable a ship to get to its berth, without interruption, rather than to a place of assistance.

Noting that marine pilots now predominantly use Portable Pilotage Units, plus ENC, plus local products and knowledge for active pilotage, with paper charts now of limited value, a change of thinking might enable the IHO to recommend to the IMO a reduced paper charting requirement for ports where pilotage services are available. In this way, a paper chart could be considered adequate if it enables a ship to get to a place where either system or pilotage assistance is available. This, in turn, would allow the role of the paper chart to evolve, in content and look, and allow it to be re-engineered so it can be easily produced from officially (and richer) published ENC data.

Conclusions

For centuries, paper charts were the core products for chart producers and users. However, this is now changing and the IHO must adapt quickly in order to better define and support a new role for the paper charts, while allowing HOs to refocus resources on meeting modern requirements instead of legacy expectations and in-grained practices.

The successful implementation of S-1xx products, in support of the IMO's e-Navigation strategy, heavily relies on the capacity of HOs to free-up and reallocate resources to the production of the future Electronic Navigational Chart (S-101) and its supporting and complementing line of products (S-102, S-104, etc).

Recommendations

a. Evaluate the possibility of negotiating with the IMO a more flexible definition of 'Back-up' chart. The main objective of these type of charts should evolve from:

   ensuring *'safe navigation <u>for the remaining part of the voyage</u> in case of ECDIS failure' (IMO resolution A.817(19), as amended or resolution MSC.232(82))*

   to

   'enabling safe navigation <u>while proceeding to 'a safe waiting place'</u> (open sea or an anchorage) while undertaking repairs or to a pilot boarding ground for subsequent guidance into port'.

   These 'Back-up' charts should be used in case of emergency only and would not be suitable as the primary means of navigation under SOLAS (berth to berth planning and monitoring may not be supported).

b. Discuss the need to create a new NCWG subWG, or amend the terms of the existing subWG on 'The future of the paper chart', to specifically look at the future role and look of paper charts in order to have a new or updated standard/PS in place by 2023. This subWG should build upon the paper prepared by the existing subWG on 'The future of the paper chart', with a key deliverable to be a working document ready to support the production of a new generation of papers charts from 2023.

Justification and Impacts

Mariners expect to get the most of the S-101 ENCs' optimised performance and smarter interaction with other complementary products as soon as the first operational S-101 ENCs are published in 2023. They will ask for what was promised to them …. richer and real time data to enhance their situational awareness and support their operations.

Fulfilling this expectation heavily relies on HOs being able to free-up and reallocate resources to the development of these new products as soon as possible.

Paper charts cannot disappear in one day and as a consequence, the IHO must develop a standardised way to facilitate its transition to a new role (back-up) and alleviate HOs' workload. Production times must be reduced by focusing on minimum necessary content and readability in a similar manner to defining a minimum and standard ECDIS display).

If the new standard is properly developed and machine-readable it could be possible to introduce a new distribution model where the HOs may end up 'delegating' the responsibilities regarding chart scheming, S-57 conversion and printing to the end user.

In simple terms, if we trust the data and the process, we should also trust its output; even more when its main goal would be to serve as ‘Back-up’ (under the new proposed definition) to electronic navigation and not as the primary means of navigation.

It is expected that the work of this new subWG may have some financial impact on the IHO as it will require working collaboratively with the private industry in order to better resource and accelerate its work.

Action Required of HSSC11

The HSSC11 is invited to:

a. Note this paper and discuss its recommendations;

b. Initiate actions to drive changes to S-4 (or allocate a new S-xxx PS) to support the production of paper charts (as close to the ‘push of a button’) from richer officially produced S-57 data.