

Paper for consideration by HSSC9
NEW PUBLICATION - MARINERS' GUIDE TO
ACCURACY AND RELIABILITY OF
ELECTRONIC NAVIGATIONAL CHARTS (ENC)

Submitted by: DQWG, Australia

Executive Summary: A study undertaken in 2012 identified that, while 75% of responding mariners claimed to understand data quality indicators on paper charts, an equal number claimed not to understand the Zones Of Confidence rating system used within ENC.

This pointed to a lack of clear and simple guidance that can be easily accessed by mariners and those providing education, particularly those making the transition from paper charts to ENC. A review of available national documents found most to be particularly complex, and attempting to explain the evolution of survey techniques over time, rather than simply focussing on the limitations a certain CATZOC rating may impose on a vessel.

To address this, a simple guide has been developed, with the intention it be published as a separate IHO Publication to which mariners and their educators can refer without the need to search within a larger publication. The publication is proposed to be numbered S-67 "Mariners' Guide To Accuracy And Reliability Of Electronic Navigational Charts (ENC)", such that it appears closely related to the existing publication S-66 "Facts about Electronic Charts and Carriage Requirements".

Related Documents: Draft publication S-67 "Mariners' Guide To Accuracy And Reliability Of Electronic Navigational Charts (ENC)".

Related Projects: DQWG Work Plan 2016-17, Task C: Maintain and extend as needed existing quality indicators in S-57 "IHO Transfer Standard for Digital Hydrographic Data", including the education of both the mariner and the cartographer, and the development of documentation (IHO Task 2.5.2)

Introduction

DQWG Work Item C.4: Investigate possible methods for how to educate practicing mariners on data quality issues. Remarks: Investigate in liaison with training institutions the adequacy of existing HO documentation on the quality aspects of the practical use of ENCs. IHO CL 51/2013 issued on this topic. To include the recommendations of HSSC5-INF4, interface with IMO/HTW (Action HSSC5/45 refers).

This paper directly addresses the Work Item, and seeks endorsement by HSSC for circulation to Member States.

Background

A 2012 study posed numerous questions to practicing mariners about their understanding of a broad range of data quality indicators on charts, with an emphasis on the 'traditional' cartographic indicators used on paper charts and spread throughout INT1. One notable result, not covered in INT1, was that 75% of respondents claimed to understand the impact of Source Diagrams and Reliability Diagrams on paper charts, but that 75% claimed not to understand the equivalent information when presented via the Zones Of Confidence system used within ENC.

Noting that there is little scope within the S-57 standard to fundamentally revise the ZOC system, HSSC directed DQWG to address the lack of clear, simple and widely accessible guidance available to mariners in the training environment and when transitioning from paper charts to ECDIS and ENC.

Unfortunately, in contacting a range of institutions, it was found that, while there are a number of national publications on the subject, they were mostly unknown, or were considered overly complex. All focussed on the evolution of survey systems and techniques over time – while this may be helpful when the era of a survey is listed in a Source Diagram, it is largely irrelevant in understanding the ZOC system in an ENC as the date of a survey is rarely populated, and even harder to find.

Discussion

The accompanying draft publication is intended to address this requirement. It is drawn from and expands upon content previously published in the Australian Seafarers Handbook, of which approximately 25,000 copies have been distributed across four editions. Elements of the same material have also been included in 'Bowditch', one of the most widely used practical guides for mariners. The material has been progressively refined in conjunction with representatives of the Nautical Institute, Carnival Cruises, and Smartship Australia, an accredited deliverer of the IMO generic ECDIS training course. The content has been successfully presented to 1200 coastal and port pilots over 15 years¹.

Key factors in developing the draft publication include:

- The existing IHO guidance regarding the ZOC system is two pages buried within over 700 pages of the S-57 standard. It is virtually impossible to find.
- The existing IHO guidance is intended for cartographers, not mariners. It is extremely limited in the guidance it provides. The table structure focuses on what is on the chart, not the more important factor of what might not be on the chart, by inappropriately relegating seafloor coverage (feature detection) to the third of four factors. It uses ambiguous wording.
- Most existing national publications are complex in that they attempt an in-depth discussion of surveying techniques as they evolved over time². The focus on evolution over time renders this advice largely irrelevant for ENC as the date of a survey is rarely populated. In contrast, most mariners with whom this has been discussed ultimately only wish to understand the impact upon them, not how the result was achieved. (For example, they wish to understand that two stars equals 'dangerous', not the various possible survey techniques which may have led to this assessment.)

¹ Australia commenced using the Zones Of Confidence system on published charts from 2001.

² The majority of nations have typically quoted a survey's source and a general date range as the only quality attribute in Source Diagrams, making 'time' the primary discriminating factor for paper chart users.

- A stand-alone publication was preferred, with closely focussed content, easily read and of minimum size to convey the necessary message. Avoidance of an overly technical focus was also preferred. The Nautical Institute produces a range of training and guidance material for mariners and invariably follows this philosophy.
- The title should be intuitively understood by mariners, possibly at the expense of being technically correct.
- A stand-alone publication can be advertised and distributed more easily than content embedded in a larger publication. It should preferably be free.
- The same interpretations should be used by all hydrographic offices in categorising their data. A separate IHO publication, easily located on the IHO website, may assist in achieving this.

Justification and Impact

Benefits. The IHO would have a publication directly addressing an identified knowledge gap among mariners. Availability via the IHO website will maximise accessibility. Reference to a single IHO publication will promote a consistent level of understanding.

Impact upon S-4 and S-57. There is no anticipated impact upon IHO Publications S-4 or S-57. The proposed publication captures existing standards and expands upon them through clarification and explanation, but does not change these standards in any way.

Impact of S-57 upon proposed S-67. Conversely, as the content within S-57 is ambiguous, DQWG has developed revised wording for the descriptive text parts of the Zones of Confidence Table and accompanying notes within S-57. Again, these provide clarification but do not change the standard. Once these text revisions to S-57 have been accepted a revised edition 2 of the proposed S-67 will be warranted.

Impact upon hydrographic offices. There is no specific resource impact upon hydrographic offices. Hydrographic offices may wish to publicize the availability of the publication to raise its profile and close the knowledge gap as quickly as possible.

Expectations upon hydrographic offices. Hydrographic offices may wish to note that one multinational cruise line organisation has policies affecting many individual cruise lines that their vessels cannot enter waters without a meaningful CATZOC populated. This has forced a return to paper charts in certain circumstances.

Actions

HSSC is requested to:

- note this paper and the key factors within it;
- note that the content of the proposed publication S-67 “Mariners’ Guide To Accuracy And Reliability Of Electronic Navigational Charts (ENC)” has undergone significant development and testing over 15 years;
- endorse the proposed publication for subsequent Member State approval.