

**15TH CHRIS MEETING
IHB, MONACO, 10-13 JUNE 2003**

**PROPOSAL FOR A NEW WORK ITEM
– DEPICTION OF ESSA, PSSA AND ATBA**

Submitted by Australia

Executive Summary:

This proposal highlights the need to consider concurrently the impact on both paper charts and ECDIS of introducing new chart symbology, such as Environmentally Sensitive Sea Areas (ESSA), Particularly Sensitive Sea Areas (PSSA) and Areas to be Avoided (ATBA).

In particular, urgent new work items are required to rationalise the symbology and associated parameters for ESSA, PSSA and ATBA to be shown on paper charts and in ECDIS.

Actions to be taken:

The CHRIS is invited to endorse the following new work items:

1. The CSPCWG (in consultation with TSMAD and C&SMWG) should review the work already undertaken by the CSC with the aim of providing a depiction of ESSAs, PSSAs and ATBAs on paper charts that can be consistent with ENC and ECDIS.
2. The C&SMWG (in consultation with CSPCWG and TSMAD) should consider the requirements for consistent ECDIS symbology for ESSAs, PSSAs and ATBAs and propose appropriate solutions.
3. The TSMAD (in consultation with CSPCWG and C&SMWG) should determine the requirements for S57 to encode ESSAs and PSSAs and propose appropriate solutions.

Related Documents:

CSC CL 7/2001 - Environmentally Sensitive Sea Areas (ESSAs)
CSC CL 1/2002 - Environmentally Sensitive Sea Areas (ESSAs)
CSC CL 2/2002 - Environmentally Sensitive Sea Areas (ESSAs)
CHRIS15/5B - Instructions for submission of proposals to CHRIS and CHRIS subsidiary bodies

Introduction / Scope

1. This submission for consideration of a new work item is raised in accordance with the proposed instructions in CHRIS15/5B.

2. In 2001, the IMO endorsed the concept of Environmentally Sensitive Sea Areas (ESSA), Particularly Sensitive Sea Areas (PSSA) and Areas to be Avoided (ATBA) and raised with the IHB the issue of depiction of these areas on charts. Subsequently, the matter was referred to the then CSC whose chairman sought 'urgent consideration' from members of CSC via CSC CL 1/2002. At that time CSC was not formally part of CHRIS and in the event initiated new symbology proposals without full consideration by either the TSMAD (responsible for the encoding rules for ENCs), nor the C&SMWG (responsible for the display of the colours and symbols on ECDIS). It is understood that the Chairman, TSMAD made a suggestion that the existing S57 object Restricted Area (RESARE) with attribute category "restricted area" could be used as an interim solution in S57e3.1; however there is no specific value for ESSA or PSSA.

Analysis / Discussion

3. A long standing aim of the IHO has been to standardise symbology on charts. Until recently, the Chart Standardisation Committee (CSC) has undertaken this role for the paper chart. Meanwhile, the Colours and Symbols Maintenance Working Group (C&SMWG), in conjunction with the Transfer Standards Maintenance and Applications Working Group (TSMAD) has worked to ensure consistency in the depiction of similar information displayed in ECDIS.

4. For the most part, the C&SMWG has taken its lead from the paper chart and has been able to adopt very similar symbology. Creating novel symbology or making significant departures from established paper chart symbols has only occurred in order to depict ENC information not available on a paper chart or where colour and other limitations have been imposed by the ECDIS Performance Standard or electronic screen technology. However, in the case of ESSAs and PSSAs it is probably not possible to simply adopt the paper chart solution proposed by the CSC.

5. For example, the CSC has designated green as an optional colour for ESSAs, but this colour may conflict badly with other features displayed on ECDIS such as radar. It may also result in the ECDIS using different colours or symbology thereby compromising the principles of standardisation. The IMO Performance Standard for ECDIS clause 1.7 states that:

“ ECDIS should have the same reliability and availability of presentation as the paper chart published by government authorized hydrographic offices.”

6. One unfortunate result would be that on a dual-fuelled ECDIS incorporating an ENC/RNC chart mosaic capability (such equipment exists) there could be two different line symbols for ESSA on the same screen. This can only lead to confusion at a time when many are already critical about the quality and quantity of ENCs and the IHO role in ECDIS.

7. It is also Australia's understanding that the CSC proposals have yet to be formally ratified by M/S. This leads to uncertainty over what individual M/S should do regarding ESSAs and PSSAs on charts. In any event, there are a number of technical issues that are unresolved and further guidance is required. At least the following needs to be addressed:

- .1 The new section B-437 for the Chart Specifications of the IHO (M-4) proposed by the CSC provides a number of options for compiling HOs; for example symbolisation - including green line, magenta line, combined lines and symbols, choice of symbols within the complex lines, green stipple borders, acronyms as text, et cetera. It is Australia's view that in the interests of standardisation such choices or discretion for compiling HO's should be very limited. M-4 is meant to be a standard and as such it should clearly describe the method of portraying these features and avoid allowing options and wide discretion. Ideally, there should be one agreed recommended symbol with appropriate compilation guidelines. This standard symbology should obviously be compatible with ECDIS.

- .2 The CSC proposals include an option to provide omit details on paper charts; but rather to insert relevant details in associated publications. This clearly compromises standardisation and at the same time provides no guidance for corresponding treatment of the same information in an ENC. The options of using simple or detailed notes on charts referring to details in associated publications, similarly provides no realistic guidance on how to depict the same boundaries and areas in ENCs. A legend or the encoding of such areas as points only helps partially; and in particular, any look-ahead functionality within ECDIS can be severely restricted if areas, and particularly larger areas, are indicated only by a point rather than an area polygon.
- .3 In order for ESSAs and PSSAs to be encoded, what specific feature codes and attributes will be required for S-57?
- .4 What can be done in the event that S-57 e3.1 remains frozen as a standard?
- .5 Are the CSC proposed colours and symbols in conflict with others already portrayed within the S-52 Presentation Library?

8. In reaching its position on this matter, Australia has sought input from a wide range of its officers across all the chart disciplines. As a result a number of questions and uncertainties have been raised regarding the consequences for Australian paper chart and ENC production. Most are likely to be equally relevant to other M/S and have therefore been included as Annexes to this submission as a means of further highlighting the issues that require further consideration and clarification.

Conclusion

9. Notwithstanding the urgent circumstances, it is Australia's view that the ESSA and PSSA proposals agreed by the CSC should have given greater consideration to their impact on ENC and ECDIS. Notwithstanding the pressing requirement to resolve the issues, there was still a case for urgent discussion and collaboration between the relevant members of CSC, TSMAD and C&SMWG. As a result, a less than satisfactory outcome has been achieved.

10. Unless there is appropriate consistency between paper charts and the depiction and handling of the same information in ECDIS, there is significant potential to adversely affect the credibility of ENCs and ECDIS.

11. It is therefore appropriate that the Chart Standardisation and Paper Chart Working Group (CSPCWG) (formerly CSC) re-open consideration of the depiction of ESSAs, PSSAs and ATBAs on paper charts in close liaison with the TSMAD and C&SMWG. Such a consideration can be achieved relatively quickly and efficiently through the establishment and use of dedicated web-based discussion groups. While this may lead to a consequent delay in endorsing the extant CSC recommendations, it should nevertheless result in a more consistent, acceptable and universal solution that is suitable both for paper charts and for ECDIS.

Priority

12. This proposal seeks to correct significant inadequacies in existing IHO standards and technical resolutions. In accordance with the guidelines provided in CHRIS15/5B, it should therefore be considered Priority level 2.

Target Completion Date

13. In view of the importance of consistently depicting ESSAs, PSSAs and ATBAs on charts this work should be completed as soon as possible and in any case within 12 months.

Action Required

14. The CHRIS is invited to endorse the following new work items:
 - .1 The CSPCWG (in consultation with TSMAD and C&SMWG) should review the work already undertaken by the CSC with the aim of providing a depiction of ESSAs, PSSAs and ATBAs on paper charts that can be consistent with ENC and ECDIS.
 - .2 The C&SMWG (in consultation with CSPCWG and TSMAD) should consider the requirements for consistent ECDIS symbology for ESSAs, PSSAs and ATBAs and propose appropriate solutions.
 - .3 The TSMAD (in consultation with CSPCWG and C&SMWG) should determine the requirements for S57 to encode ESSAs and PSSAs and propose appropriate solutions.

POTENTIAL ISSUES FOR HYDROGRAPHIC OFFICES' CONSIDERATION

HO's may need to consider the following:

- a. Would ESSA boundaries (and areas) be indicated on national charts or special charts? (see B-437.5 bold text on page 7 of CL 1/2002) Some HO's already indicate MEPAs and MPAs.
- b. Would the proposed charted notes also be in green if the ESSA boundaries are indicated in green? It is unclear from B-437.3
- c. A problem may also exist in encoding areas within an ENC when the extents are not clearly defined on the paper chart. This is difficult to accommodate in an ECDIS that has the potential to trigger indications and alarms from such areas.
- d. Are several separate symbols required when there are ESSAs within ESSAs or there are common boundaries between ESSAs? What about combinations of ESSAs and PSSAs or other restricted areas?
- e. Would PSSA boundaries (and areas) be indicated on national charts or special charts, as the charting of these is considered to be a protective measure and the IMO Resolution A.885(21) states that 'When a PSSA is finally designated, all associated protective measures should be identified on charts in accordance with symbols and methods of the IHO. (see B-437.6a., page 8 of CL 1/2002)?
- f. If HO's indicate PSSAs on national charts, can they logically NOT show ESSAs?
- g. Can all HO's support an additional colour in printing charts? (green for ESSAs, PSSAs and associated notes, together with an optional green stipple band for PSSAs). The CSC CL summary at the rear indicates that many HO's are opposed to an additional colour in printing.
- h. What is the impact of using a complex line style incorporating the sea horse, seal or bird together with IN 1.2 or 2.1? (see B-437.7, bottom of page 12 in the CL 1/2002).
- i. What is the impact of adopting multi-colour/feature lines incorporating green and magenta?
- j. B-435.7 includes the definition of 'Areas to be avoided' (ATBA) which has been expanded to include the protection of natural features such as the 'reef areas' (see Annex B, page 1). This has the potential to impact on some nations' paper charts, RNCs and ENCs with potential clutter and misunderstanding between existing, adjoining and overlapping maritime boundaries, as the common INT 1 IN 2.1 'T' magenta symbol is proposed as well as an additional charted note.
- k. B-435.11 proposes a new category of 'No anchoring areas' under the IMO's General provisions on Ships' Routing, as amended by IMO SN/Circ.215 dated 19 January, 2001 (see Annex B page 2 to the CL 1/2002). This again has implications for reef areas and may require formal adoption by the other national authorities concerned.
- l. This development may open the door to many other maritime boundaries and areas being portrayed on the paper and electronic charts. Just how far are Member States prepared to go

with this? Is it time to rethink what information should (needs to be?) portrayed on the national (and International) nautical chart? The features we are now talking about have national interests at stake, more than just navigation. If HOs do not chart them, who will? Naturally if HOs portrayed such features, they would be taking on an extra level of responsibility, but this responsibility could be shared by insisting that the authorities responsible for the legislation and policing of any restrictions, be made responsible for advising HOs of any alterations and changes to such boundaries and or areas. The time frames for promulgating such information must also be agreed. It may be advisable for HOs to discuss the issues with other national authorities responsible for such areas.

- m. If HOs decide not to chart the new boundaries and areas, should they be described or depicted graphically in Annual Notices to Mariners and or the Sailing Directions?

POTENTIAL ISSUES FOR C&SMWG CONSIDERATION

C&SMWG may wish to consider at least the following:

1. If green was adopted for paper charts, could it be used within the S-52 presentation Library without conflicting with other green objects, such as radar and green sector lights? A green line for ESSAs may be invisible under a green sector light. What are the implications?
2. If paper charts use green lines, the RNCs will also have green lines. If the SENCs do not display green line symbols, there will be a miss match between multi-fuelled ECDIS which display both RNCs and SENCs at the same time side by side on the one display.
3. What potential is there for these areas and boundaries to lose their contrast and clarity if merged with other complex areas where several maritime boundaries already exist? What happens when ESSAs have a common boundary with other ESSAs or restricted areas (**RESAREs**)? What happens when ESSAs are within ESSAs with different attributes? Which has priority? These situations all have potential to cause clutter and obliterate several overlapping maritime areas or boundaries.
4. The C&SMWG has agreed that no new symbols will be introduced without extensive sea trials. If this issue is so urgent, can an interim solution be investigated without the agreed sea trails?
5. If a new symbol(s) need to be adopted, will these require tests within IEC 61174 for Type Approval?

POTENTIAL ISSUES FOR TSMAD CONSIDERATION

TSMAD members may wish to consider at least the following:

1. Is there an existing object(s) and associated attributes/values suitable within S-57 Edition 3.1 to cover such areas as ESSAs, PSSAs, ATBAs? The existing object classes **RESARE** and **CTNARE** appear to be suitable, however what attributes/values are required? There is no attribute 'Category of Caution Area' for example and there may not be adequate values for the attributes 'Categories of Restricted Area' nor 'Restriction'. There has already been discussion for S-57 Edition 4.0 to include new objects such as "Maritime Boundaries" and "Maritime Areas", which may also include some new attributes not within S-57 Edition 3.1. It would appear from the CSC CLs on ESSA, etc that these features are very important thereby warranting a new section within M-4. Perhaps they also require a specific Object Class within S-57?
2. If a new object is required, will the ENC test data sets require updating and subsequent new editions issued?
3. The CSC circular letters broaden the definition for IMO 'Areas To Be Avoided' (ATBA) and if adopted, would require a clarification and correction to S-57, edition 3.1 for value 14 for attribute RESTRNAs. S-57 Edition 3.1 is frozen, so there is no maintenance mechanism available to make such clarifications or corrections.