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Paper for Consideration by TSMAD

ENC Encoding Bulletin – Virtual AIS Aids to Navigation

Submitted by:	S-57 Maintenance Sub-Working Group Coordinator
Executive Summary:	Action on TSMAD from HSSC4 - Draft ENC Encoding Bulletin to allow encoding of Virtual AIS Aids to Navigation in ENCs.
Related Documents:	S-57 Appendix B.1, Annex A – Use of the Object Catalogue for ENC; ENC Encoding Bulletins and FAQs; HSSC4-05.1H rev1; TSMAD21-4.9.2.
Related Projects:	S-57 Maintenance; S-101 Development

Introduction / Background

An action on TSMAD from HSSC4 is to develop an ENC Encoding Bulletin describing an application for the NEWOBJ object in accordance with S-57 Edition 3.1, Supplement No. 2. This application of NEWOBJ is to allow for the encoding of Virtual AIS aids to navigation in ENC. A draft ENC Encoding Bulletin and FAQ is included at Attachment 1 to this Paper for consideration of TSMAD, as well as associated new draft S-58 check at Attachment 2. The draft Encoding Bulletin is based on a paper originally submitted to TSMAD21 by UK (TSMAD21-4.9.2).

Analysis / Discussion

Paper HSSC4-05.1 rev 1, submitted to HSSC4 by TSMAD, documents the discussions within TSMAD, and between IHO and IMO, since 2010 regarding the encoding of AIS Aids to Navigation information in ENC. In particular, discussions within the IMO on the development of symbols to depict Virtual AIS Aid to Navigation broadcast signals in ECDIS, without any formal IMO discussion regarding the intended use of such signals or the circumstances under which they will be broadcast, were identified as a concern by IHO.

Notwithstanding this, increasing implementation of Virtual AIS Aids to Navigation world-wide and mariner feedback expressing concern that Virtual AIS Aids to Navigation are not present in ENC has necessitated further discussion. Introduction of symbols and guidance to depict Virtual AIS Aids to Navigation information on paper charts in S-4 as developed by the CSPCWG, as well as concerns raised that Virtual AIS Aid to Navigation information may be relevant for route planning, resulted in the development of the Paper submitted to HSSC4. The recommendation in the Paper was to approve an application of the NEWOBJ object and develop either an ENC Encoding Bulletin and or a new S-57 Supplement describing how the NEWOBJ is to be used to encode Virtual AIS Aids to Navigation in ENC. HSSC approved the use of NEWOBJ, and has directed TSMAD to develop an ENC Encoding Bulletin describing how the object is to be used.

A draft ENC Encoding Bulletin and corresponding FAQ, based on the Paper submitted to TSMAD21 containing a suggested encoding for the NEWOBJ object (TSMAD21-4.9.2) has been developed, and is included at Attachment 1 for the consideration of TSMAD. The intended resultant symbology for each NEWOBJ encoding combination (derived from the existing S-52 Symbol Library as specified in S-57 Edition 3.1, Supplement No. 1) is also included at Attachment 1 for information, and will need further consideration by the DIPWG. In order to enforce compliance in ENC validation software, an additional draft S-58 check, for inclusion in S-58 Edition 5.0.0 (currently being developed) has also been included for the consideration of TSMAD.

As the implementation of the NEWOBJ object is to be considered as an interim solution in S-57, it is suggested that new features and appropriate encoding guidance be developed for S-101 in order to have a better implementation for the encoding of Virtual (and perhaps also Real and Synthetic) AIS Aids to Navigation in S-101 ENC.

Recommendations

1. That TSMAD consider the draft ENC Encoding Bulletin No. 53 at Attachment 1 for suitability as an application of the NEWOBJ object for encoding Virtual AIS aids to navigation. If agreed, TSMAD to consult with the DIPWG on the suitability of the resultant ECDIS symbols.
2. That TSMAD consider the draft new check for S-58 included at Attachment 2.
3. That the TSMAD S-101 DCEG Sub-WG develop a proposal for the modelling of new features, attributes and enumerates to enable the encoding of AIS Aids to Navigation in S-101 ENCs.

Justification and Impacts

HSSC has directed TSMAD to develop a method for the encoding and presentation of Virtual AIS Aids to Navigation in S-57 ENCs in order to satisfy a mariner requirement. The proposals in this Paper impact on Producing Authorities who wish to include this information in their ENCs. It is intended that the information included in the resultant ENC Encoding Bulletin be included in the next Version of the UOC, and the work of the S-101 DCEG Sub-WG will impact on the IHO Geospatial Registry and the S-101 Feature and Portrayal Catalogues, and Data Classification and Encoding Guide.

Action required of TSMAD

TSMAD is invited to:

- a. Discuss the draft ENC Encoding Bulletin and FAQ at Attachment 1;
- b. Consider the example ECDIS symbology at Attachment 1 for submission to DIPWG;
- c. Discuss the draft S-58 check at Attachment 2; and
- d. Instruct the S-101 DCEG Sub-WG to consider appropriate modelling for AIS Aids to Navigation in S-101.

EB54 - UOC Clause 12.14.1 AIS equipped aids to navigation

Clause 12.14.1 of Edition 3.1.0 (October 20121) of the *Use of the Object Catalogue for ENC* (S-57 Appendix B1, Annex A) provides guidance for the encoding of Automatic Identification System (AIS) broadcast messages used as aids to navigation, including a statement that it is currently not possible to encode Virtual AIS Aids to Navigation in ENC.

Given that AIS technology is increasingly being used for aids to navigation purposes, the IHO Hydrographic Services and Standards Committee (HSSC) considers that there is now a requirement to implement an interim solution to enable the encoding of Virtual AIS Aids to Navigation in ENC. Accordingly, the HSSC has approved the use of the **NEWOBJ** object class, introduced through S-57 Edition 3.1, Supplement No.1, to enable the encoding of Virtual AIS Aids to Navigation in ENC.

Encoders are advised, therefore, that in order to encode Virtual AIS Aids to Navigation information in ENC, the following encoding specification must be applied:

If it is required to encode a Virtual AIS Aid to Navigation, it must be done using the object class NEWOBJ;

Geo object: New object (NEWOBJ) (P)
Attributes: CLSNAM CLFDEF DATEND DATSTA INFORM NINFOM NOBJNM
 OBJNAM TXTDSC NTXTDS SORIND SORDAT SYMINS

The following table shows the combinations for the mandatory attributes CLSDEF, CLSNAM and SYMINS that must be populated, according to the purpose of the Virtual AIS Aid to Navigation:

<u>Purpose of Virtual Aid</u>	<u>CLSDEF</u>	<u>CLSNAM</u>	<u>SYMINS</u>
North Cardinal	A Virtual object which indicates navigable water lies northwards	Virtual AtoN, North Cardinal	SY(BCNCAR01);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
East Cardinal	A Virtual object which indicates navigable water lies eastwards	Virtual AtoN, East Cardinal	SY(BCNCAR02);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
South Cardinal	A Virtual object which indicates navigable water lies southwards	Virtual AtoN, South Cardinal	SY(BCNCAR03);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
West Cardinal	A Virtual object which indicates navigable water lies westwards	Virtual AtoN, West Cardinal	SY(BCNCAR04);SY(BRTHNO01);TEX('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Port lateral (IALA A)	A Virtual object marking the port side of a channel	Virtual AtoN, Port Lateral	SY(BOYLAT24);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Starboard Lateral (IALA A)	A Virtual object marking the starboard side of a channel	Virtual AtoN, Starboard Lateral	SY(BOYLAT13);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Port lateral (IALA B)	A Virtual object marking the port side of a channel	Virtual AtoN, Port Lateral	SY(BOYLAT23);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Starboard Lateral (IALA B)	A Virtual object marking the starboard side of a channel	Virtual AtoN, Starboard Lateral	SY(BOYLAT14);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Isolated Danger	A Virtual object marking an isolated danger	Virtual AtoN, Isolated Danger	SY(BCNISD21);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Safe Water	A Virtual object marking safe water	Virtual AtoN, Safe Water	SY(BOYSAW12);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Special Purpose	A Virtual object used to mark a feature which is apparent from the chart	Virtual AtoN, Special Purpose	SY(BOYSPP11);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
Emergency Wreck Marking	A Virtual object marking a wreck	Virtual AtoN, Wreck Marking	SY(BOYSPP11);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)

For reasons of backward compatibility the mandatory attribute **INFORM** must contain the values of **CLSNAM** and **CLSDEF** for the object.

Where known the attribute **OBJNAM** should be populated with the **MMSI** number of the Virtual AIS Aid to Navigation, in addition to its individual name, e.g. *Nab Rock, MMSI 995031014*.

Virtual AIS Aids to Navigation should only be encoded where it is known that the Virtual Aid is intended to be permanent, or deployed for a specified fixed period. Where it is known that a Virtual AIS Aid to Navigation is moved or withdrawn on a regular basis and/or at short notice, such that implementing these changes through the application of ENC Updates is impractical, the Virtual Aid should not be encoded.

FAQ

Q 44 *Is it possible to encode a virtual AIS aid to navigation in ENC?*

A 44 Yes, this can be done by using the object class **NEWOBJ**. See ENC Encoding Bulletin No. 54.



Proposed new S-58 Check:

Check:

Check that any NEWOBJ object has attributes CLSDEF, CLSNAM and SYMINS populated with exactly one of the following combinations:

<u>CLSDEF</u>	<u>CLSNAM</u>	<u>SYMINS</u>
A Virtual object which indicates navigable water lies northwards	Virtual AtoN, North Cardinal	SY(BCNCAR01);SY(BRTHNO01);TEX('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object which indicates navigable water lies eastwards	Virtual AtoN, East Cardinal	SY(BCNCAR02);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object which indicates navigable water lies southwards	Virtual AtoN, South Cardinal	SY(BCNCAR03);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object which indicates navigable water lies westwards	Virtual AtoN, West Cardinal	SY(BCNCAR04);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object marking the port side of a channel	Virtual AtoN, Port Lateral	SY(BOYLAT24);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object marking the starboard side of a channel	Virtual AtoN, Starboard Lateral	SY(BOYLAT13);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object marking the port side of a channel	Virtual AtoN, Port Lateral	SY(BOYLAT23);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object marking the starboard side of a channel	Virtual AtoN, Starboard Lateral	SY(BOYLAT14);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object marking an isolated danger	Virtual AtoN, Isolated Danger	SY(BCNISD21);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object marking safe water	Virtual AtoN, Safe Water	SY(BOYSAW12);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object used to mark a feature which is apparent from the chart	Virtual AtoN, Special Purpose	SY(BOYSPP11);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)
A Virtual object marking a wreck	Virtual AtoN, Wreck Marking	SY(BOYSPP11);SY(BRTHNO01);TE('V-AIS',3,2,2,'15110',2,0,CHMGD,11)

Conformity to: ENC Encoding Bulletin No. 54.

Category: Error