

**Joint TSMAD20 & DIPWG2 Meeting
Rostock, Germany, 3-7 May 2010**

Submitted by:	Jean-Luc Déniel – SHOM (FR)
Executive Summary:	Management of Encoding Bulletins
Related Documents:	<ol style="list-style-type: none"> 1) S-57 IHO Transfer Standard for Digital Hydrographic Data 2) S-57 Edition 3.1 Encoding Bulletins 3) IHO Circular Letter 21/2010 – 24 February 2010 4) M-3 Resolution A1.21 “Principles and procedures for making changes to IHO technical standards and specifications” 5) Standardised Development, Consultation and Approval Procedures for IHO Technical Standards (HSSC1-06.1B)
Annex:	Exam of existing encoding bulletins

Introduction / Background

By the circular letter in reference 3, the IHB alerted Members States producing ENC's of a possible danger for navigation due to the fact that Encoding Bulletin 27 was not applied on all the ENC's. If this EB 27 is not applied this may cause some ECDIS to not display some dangerous shoals and trigger the alarm related to this danger.

To avoid the appearance of another problem of the same type, we have to answer some questions:

1. Was an Encoding Bulletin the good way to solve the problem of shoals which are not displayed and are not triggering alarms?
2. Are we sure that all ENC producers are aware of the publication of a new EB and that the impact of the EB on the safety of navigation is clearly exposed?
3. Which IHO body is entitled to approve an EB?
4. Are there other existing EBs which must be applied to already published ENC's?

Analysis / Discussion

1. Use of an Encoding Bulletin

The information that a sounding is shoaler than the depth area in which it is included is encoded in the attribute EXPSOU (value = 2), but this attribute seems not to be used by some ECDIS for display and alarms.

This problem related to the ECDIS standards has been solved by a change in the ENC encoding rules. It comes probably from three reasons. First, it was submitted to TSMAD which is in charge of the maintenance of ENC standards; second, because a change on encoding rules has only an internal impact inside the IHO (WGs and MSs), and doesn't not involve external actors (IMO, IEC, manufacturers...); third, there is a normal and easy way to correct data which the use of ERs.

Normally, a change on the ENC encoding rules should be made through a modification of the product specifications which is a part of S-57, but ... S-57 is frozen. The only way to give a new rule to the encoder is to do a clarification by the means of an encoding bulletin. In this case, there are three ways to encode a shoal sounding in an ENC:

- a sounding with EXPSOU = 2,

- a sounding surrounded by the adequate depth contours and the creation of the corresponding depth areas,
- an object like an obstruction or an underwater rock.

Saying that the encoder is advised to use only one of the two last methods can be considered as a clarification.

Remark: As it is more complicated to create new contours than to create an obstruction, many producers have chosen this easy option. We can consider that this is the introduction of errors in ENC's to produce a good appearance of alarms and a quite good display on the screen.

So the use of an encoding bulletin was not a perfect solution but seemed to be a practical way to solve the problem in front of the lack of other solution.

2. Publication of a new Encoding Bulletin

There are three points which make an encoding bulletin very weak when it concerns the safety of navigation:

- When a new Encoding Bulletin is approved by the TSMAD, the decision appears in the minutes of a meeting and it is published on the IHO website. Members of TSMAD attending this meeting are aware of this publication; may be not all ENC producers. This information is not pushed to them.
- There is no standard in the writing of an EB to draw the attention of a producer on the impact on the safety of navigation.
- An encoding bulletin is not compulsory. This is clearly said in the introduction about EBs on the IHO web site: *"It should be noted that the procedures described in these Bulletins are not compulsory; however it is strongly recommended that data producers follow them wherever possible to ensure the consistency of ENC production worldwide."*

For a better efficiency the announcement of a new encoding bulletin should be made by a circular letter from IHB stating clearly if it corrects a problem concerning the safety of navigation and if it is compulsory.

3. Approval of a new Encoding Bulletin

In the introduction about EBs it is written that *"New bulletins must be approved by the TSMADWG."*

This is a minimum.

IHO resolution A1.21, as it is today, "Principles and procedures for making changes to IHO technical standards and specifications" doesn't apply to the encoding bulletins used for clarification because it says in its second paragraph of its "Scope" title: *"These procedures are not intended to be applied to minor or technical issues that arise from the work of HSSC and its subordinate bodies, or for the correction of identified problems or for clarification of elements of the standards themselves."*

This sentence has been removed from the change proposal presented during the first HSSC meeting in Singapore last November (see ref 5). Paragraph 3.2.5 of this new proposal says: *"HSSC Working Groups may assess and authorize clarifications to standards and associate references, subject to seeking input from relevant stakeholders"*.

Following those principles which have been accepted by HSSC, the level of approval for Encoding Bulletins, as far as they are clarifications and they cannot be something else because the S-57 is frozen, is the TSMAD.

An approval by HSSC for the encoding bulletins which have an impact on safety of navigation (and are in fact more than clarifications) could slow the process for the most important bulletins but could be a way to improve the communication about the publication of a new EB and to assure that the wording is clear for people who are not participating in the working group.

4. Examination of existing Encoding Bulletins

A first review of existing Encoding Bulletins shows eight of them related to safety of navigation (see annex 1). This list is to be discussed by TSMAD.

Actions required of TSMAD

Ask IHB to change the introduction on the encoding bulletin web page.

Ask IHB to publish a circular letter for each new encoding bulletin.

Include a statement in each encoding bulletin saying if it concerns the safety of navigation or not, if it is compulsory or not, and if existing ENC's must be reviewed.

To prepare a paper for the next HSSC meeting to clarify the level of approval for Encoding Bulletins related to safety of navigation.

Review all existing bulletins; identify all those which are related to safety of navigation and prepare a recapitulative circular letter.

EB1a - UOC clause 10.1.1 Navigational lines (NAVLNE) and recommended tracks (RECTRC)

Compulsory – Safety of navigation – Existing ENC's to be reviewed

The third bullet point of clause 10.1.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) states: "*When the traffic flow is one way, the direction of digitising of an object of type line **should** be the same as the direction of the traffic flow*".

The use of the word '**should**' in this sentence means that the advice is only recommended and not mandatory. However, if this rule is not followed and navigation lines and recommended tracks are digitised in the opposite direction, the direction arrows shown on ECDIS displays will show the direction of traffic flow incorrectly.

Encoders are strongly advised, therefore, to follow this rule and digitise such lines in the direction of the traffic flow thereby avoiding possible ECDIS display problems.

EB1b - UOC clause 10.2.2.2 Deep Water Route Centerline (DWRTCL)

Compulsory – Safety of navigation – Existing ENC's to be reviewed

As per 1.a above, the first remark, in clause 10.2.2.2 needs to have its obligation changed from "should" to "must" i.e. "*When the traffic flow is one way (attribute TRAFIC = 3), the direction of digitising ~~should~~ **must** be the same as the direction of traffic flow, thereby avoiding possible ECDIS display problems.*"

This is required as the S-52 Presentation Library (Edition 3.3) actually calculates the bearing of the digitised line and displays the bearing text based on this calculation. (The PL does NOT use the attribute ORIENT to display this text).

EB1c - UOC clause 10.2.4 Recommended Route Centerline (RCRTCL)

Compulsory – Safety of navigation – Existing ENC's to be reviewed

As per 1.a above the first remark, in clause 10.2.4 needs to have it's obligation changed from "should" to "must" i.e. "*When the traffic flow is one way (attribute TRAFIC = 3), the direction of digitising ~~should~~ **must** be the same as the direction of traffic flow, thereby avoiding possible ECDIS display problems.*"

This is required as the S-52 Presentation Library (Edition 3.3) actually calculates the bearing of the digitised line and displays the bearing text based on this calculation. (The PL does NOT use the attribute ORIENT to display this text).

EB2 -UOC clause 6.2.1 - Wrecks

Please note that this item has been SUPERSEDED as the result of changes made to the Conditional Symbology Procedure for displaying this object class in ECDIS.

The fourth bullet point of clause 6.2.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) states: *"A WRECKS object of type area must be covered by an area object from Group 1 as appropriate."*

It is important that the underlying Group 1 area object uses the same spatial object as the wreck. If it does not, and the wreck is enclosed within a larger overlapping Group 1 object of less depth than the surrounding DEPARE, the ECDIS test for whether a wreck of less depth than the safety contour is lying in water deeper than the safety contour will fail because the test finds only the underlying Group 1 area. As a result, the dangerous wreck will not be prominently symbolised as an isolated danger, as it should be.

EB3 - UOC clause 6.2.2 – Obstructions and foul areas

Please note that this item has been SUPERSEDED as the result of changes made to the Conditional Symbology Procedure for displaying this object class in ECDIS.

The second bullet point of clause 6.2.2 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) states: *"An OBSTRN object of type area must be covered by an area object from Group 1 as appropriate."*

It is important that the underlying Group 1 area object uses the same spatial object as the obstruction. If it does not, and the obstruction is enclosed within a larger overlapping Group 1 object of less depth than the surrounding DEPARE, the ECDIS test for whether an obstruction of less depth than the safety contour is lying in water deeper than the safety contour will fail because the test finds only the underlying Group 1 area. As a result, the dangerous navigational obstruction will not be prominently symbolised as an isolated danger, as it should be.

EB4 - UOC clause 4.8.5 – Dams (DAMCON)

Recommended

Clause 4.8.5 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) does not include the situation where a dam is coincident with a coastline.

Encoders should note, therefore, that if it is required to encode a dam whose seaward edge is coincident with the coastline, it must be done using DAMCON, with a SLCONS object of type line along its seaward edge, with no value populated for attribute CATSLC.

(This addition is required to ensure that the coastline remains in the S-52 display base in accordance with the IMO Performance Specifications for ECDIS).

EB5 - UOC clause 11.9.1 - Fishing facilities

Compulsory – Safety of navigation – Existing ENCs to be reviewed

Fishing facilities currently do not trigger any danger symbols on an ECDIS (S-52 PL edition 3.3), even if they are an obstruction or hazard to navigation. Certain types of fishing facilities such as tunny nets in deep water, can however be an obstruction to navigation.

It is recommended that if FSHFAC objects are considered to be an obstruction or

hazard to navigation, they should also be encoded with an OBSTRN object. Although this is contrary to ENC encoding principles (i.e. double encoding), this solution is recommended for portraying dangers to navigation of this nature.

EB6 - UOC table 6.2 Wrecks

Recommended

Table 6.2 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) does not set the least depth over wrecks by divers.

Encoders should note, therefore, that if it is required to encode a measured depth over WRECKS, QUASOU values 1 or 6 may be used.

Encoders should note, therefore, that if it is required to encode a measured depth over WRECKS by a diver, QUASOU values 1 or 6 may be used, together with TECSOU = 4. See also M-4, D-422.3 and INT 1 K27.

Encoders should note, therefore, if the depth is not measured to consider a QUASOU value of 7.

These values may be used together with those in table 6.2 of Edition 2.1 (April 2002) in the Use of the Object Catalogue (S-57 E3.1, Appendix B1, Annex A)

EB7 - UOC table 6.3 Obstructions

Recommended

Table 6.3 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) does not set the least depth over obstructions by divers.

Encoders should note, therefore, that if it is required to encode a measured depth over obstructions, QUASOU values 1 or 6 may be used.

Encoders should note, therefore, that if it is required to encode a measured depth over obstructions by a diver, QUASOU values 1 or 6 may be used, together with TECSOU = 4. See also M-4, D-422.3 and INT 1 K27.

Encoders should note, therefore, if the depth is not measured to consider a QUASOU value of 7.

These values may be used together with those in table 6.3 of Edition 2.1 (April 2002) in the Use of the Object Catalogue (S-57 E3.1, Appendix B1, Annex A)

EB8 - UOC Clause 6.6 Caution areas

Recommended

Clause 6.6 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) provides general guidance for the encoding of caution areas. Some nations have introduced collision regulations (COLREGs) that may include demarcation lines differentiating between inland water rules and International Rules as a result of the Convention on the International Regulations for Preventing Collisions at Sea 1972.

Encoders should note, therefore, if it is required to encode COLREGs, it may be done using the object class **CTNARE**, with the attribute **INFORM** and/or **TXTDSC** containing a short explanation about the regulation, (e.g. cautionary note from the paper chart). The attribute **TXTDSC** may be used instead of **INFORM**, or for longer explanations or notes.

EB9 - UOC Clause 12.8.6.5 Directional lights (LIGHTS)

Recommended

Clause 12.8.6.5 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) provides encoding advice for directional lights. To avoid possible duplicated (and sometimes miss-aligned) portrayal of the leading line portion of a directional light when **RECTRC** is also encoded along the same bearing as the directional light, the following encoding practices should be adopted:

Encoders should note that if it is required to encode a directional light that is associated with a **RECTRC**, or a **NAVLNE**, the **ORIENT** of the directional **LIGHTS** object should not be populated (null value).

Encoders should note that if it is required to encode a directional light that comprises a narrow intensified sector, the sector should be encoded using **SECTR1** and **SECTR2**, and **ORIENT** should not be populated (null value). The attribute **ORIENT** should only be encoded for directional lights when **SECTR1** and **SECTR2** are not populated, and when there is no **RECTRC** or **NAVLNE** coupled with the directional light.

EB10 - UOC Clauses 4.6.6.2 Floating Docks (FLODOC)

Recommended ?

Clause 4.6.6.2 Floating Docks of Edition 2.1(April 2002) of Use of the Object Catalogue(S-57 Appendix B.1, Annex A) provides encoding advice for floating docks. As the S-52 Presentation Library does not alter the portrayal of any **group 1** object classes with reference to **DATEND** and **DATSTA**, the following encoding practices should be adopted:

Encoders should note that **DATEND** and **DATSTA**, should not be encoded for any group 1 object classes.

A **CTNARE** object may be used to warn the mariners that the presence of a floating dock is temporary or periodic. Encoders should note that **CTNARE** may be used for **DATEND** and **DATSTA**, with **INFORM** or **TXTDSC** as per UOC Clause 2.6.1d Edition 2.1(April 2002).

EB11 - UOC Clauses 4.6.7.3 Pontoons (PONTON)

Recommended ?

Clause 4.6.7.3 Pontoons of Edition 2.1(April 2002) of Use of the Object Catalogue(S-57 Appendix B.1, Annex A) provides encoding advice for pontoons. As the S-52 Presentation Library does not alter the portrayal of any **group 1** object classes with reference to **DATEND**, **DATSTA**, **PEREND** and **PERSTA**, the following encoding practices should be adopted:

Encoders should note that **DATEND**, **DATSTA**, **PEREND** and **PERSTA** should not be encoded for any group 1 object classes.

A **CTNARE** object may be used to warn the mariners that the presence of a pontoon is temporary or periodic. Encoders should note that **CTNARE** may be used for **DATEND**, **DATSTA**, **PEREND** and **PERSTA** with **INFORM** or **TXTDSC** as per UOC Clause 2.6.1d Edition 2.1(April 2002).

EB12 - UOC Clause 4.1 Land Area (LNDARE)

Recommended

Clause 4.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) provides advisory encoding of land area. **OBJNAM** will be portrayed on all type approved ECDIS that have been updated to the future Edition 3.4 of the S-52 Presentation Library.

Encoders should note that once the S-52 Presentation Library, Edition 3.4 is operational on 1 January 2008, identical **OBJNAMs** should not be populated for other object classes (such as **LNDRGN** or **ADMARE**) if **LNDARE** at that location is populated with **OBJNAM**. HO's may need to remove double encoding of **OBJNAM** from land regions and other object classes, from existing ENC's, if the purpose was to portray the **OBJNAM**

EB13 - UOC Clause 4.8.14 Built-up areas (BUAARE)

This Encoding Bulletin is Presently under Review

Clause 4.8.14 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) provides advisory encoding of built-up areas. **OBJNAM** will be portrayed on all type approved ECDIS that have been updated to the future Edition 3.4 of the S-52 Presentation Library.

Encoders should note that once the S-52 Presentation Library, Edition 3.4 is operational on 1 January 2008, identical **OBJNAMs** should not be populated for other object classes (such as **LNDRGN** or **ADMARE**) if **BUAARE** at that location is populated with **OBJNAM**. HO's may need to remove double encoding of **OBJNAM** from land regions and other object classes, from existing ENC's, if the purpose was to portray the **OBJNAM** of a land area.

EB14 - UOC Clause 12.1.2 Relationships

Recommended

Clause 12.1.2 of Edition 2.1(April 2002) of Use of the Object Catalogue(S-57 Appendix B.1, Annex A) states: *"When the navigational aid contains a structure object (from the above list), this object must be the master object, and the equipment objects must be the slaves. When the nature of the base structure is unknown or there is no structure object, one of the equipment objects must be chosen as the master object, giving priority to a LIGHTS object, if one exists."*

Due to the presence of **DAYMAR** object in both lists (structure and equipment objects), different and inconsistent interpretations currently exist.

Encoders should note that **DAYMAR** objects should be considered as equipment (slave) unless there is no other structure object present, in which case it can be considered as structure (master).

EB15 - UOC Clause 11.2.0 Maritime jurisdiction areas

Recommended

Clause 11.2 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57 Appendix B.1, Annex A) provides guidance on the encoding of maritime jurisdiction areas. Occasionally, these “areas” may actually be defined as linear due to international treaties, or the areas may not be fully defined and it may therefore be necessary to encode the boundary as a linear feature. Table 3.1 of Edition 2.0 (November 2000) of the ENC Product Specification (S-57 Appendix B.1) defining objects permitted for use in ENC and their geometric primitives does not allow many of the Object Classes relating to maritime jurisdiction areas to be encoded as type line.

Due to the requirement for objects comprising maritime jurisdiction areas to sometimes be represented on ENC as linear features, a consistent method of encoding using the existing area primitive is required.

Encoders are strongly advised to encode linear maritime jurisdiction features in the manner described below to ensure ENC consistency among producing agencies. **This method must not be used where an area can be defined.**

If it is required to encode a linear maritime jurisdiction feature, it must be done using the corresponding Object Class from Maritime jurisdiction areas (see UOC Clause 11.2). Where the “line” primitive is not permitted for a related Object Class, the linear maritime jurisdiction feature must be encoded as a “very narrow area” and by masking all the edges of the area that are not relevant (i.e. not along the reference line).

The “very narrow area” should be an area having an edge corresponding to the reference line and be about 0.2mm in width at ENC Compilation Scale.

Caution notes for such features must be encoded using the attributes **INFORM** and/or **TXTDSC** for the very narrow area.

EB16 - UOC Clause 11.2 Maritime jurisdiction areas: Disputed claims

Recommended

Clause 11.2 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57 Appendix B.1, Annex A) provides guidance on the encoding of maritime jurisdiction areas in line with Article 55 of the United Nations Convention on the Law of the Sea (UNCLOS – 10 December 1982). Test 1700 of Edition 3.0 (January 2007) of the Recommended ENC Validation Checks (S-58) categorizes an Error where a Territorial Sea Area and an Exclusive Economic Zone (EEZ) overlap. Occasionally, small areas at the boundary of two or more Coastal States may be in dispute regarding the establishment of maritime jurisdiction, which may result in a small section of Territorial Sea overlapping an EEZ in the disputed area.

The IHO Worldwide Electronic Navigational Chart Database (WEND) Principles state in part: *“When the limits of waters of national jurisdiction between two neighbouring countries are not established, or it is more convenient to establish boundaries other than established national boundaries, producing countries are to define the boundaries for ENC production within a technical arrangement. These limits would be for cartographic convenience only and shall not be construed as having any significance or status regarding political or other jurisdictional boundaries.”*

Encoders should note that, where issues of maritime jurisdiction between two or more Coastal States are in dispute, the proposed Territorial Sea (**TESARE**) of one Coastal State may overlap the proposed EEZ (**EXEZNE**) of another Coastal State. In this case, S-58 test 1700

may be ignored until the dispute is settled. Where an area is in dispute, a **CTNARE** object should be encoded covering the entire disputed area, with caution notes advising that the area is in dispute encoded using the attributes **INFORM** and/or **TXTDSC**.

EB 17 - Automatic Identification System (AIS) in ENC

Recommended

The IHO Charting Standards Paper Chart Working Group (CSPCWG) has developed new symbols to portray AIS on paper charts (see INT1 – S17.1 and S17.2). As ENCs are intended to be used in conjunction with ECDIS as part of an Integrated Bridge System, it is not necessary to encode AIS in ENC cells.

Encoders are to note, therefore, that AIS information should not be included in ENC cells.

[Feb 2008]

EB18 - ENC PS Clause 2.2 Cells: 180° Meridian of Longitude

Compulsory – Safety of navigation – Existing ENCs to be reviewed

Clause 2.2 of edition 2.0 (November 2000) of the ENC Product Specification (S-57 Appendix B.1) describes the construct, including geographic extent, to be used for ENC cells. This clause does not address ENC cells that cross the 180° Meridian of Longitude. There is currently no production software or ECDIS system that can handle ENC cells that cross the 180° Meridian.

Encoders are to note that, to avoid load and display issues in ECDIS, ENC cells must not span the 180° Meridian of Longitude.

[Jan 2008]

EB19 - UOC Clause 12.4.1 Buoys: Emergency Wreck Marking Buoy

Recommended

IHO Circular Letter 25/2007 (26 February 2007) – New IALA Emergency Wreck Marking Buoy encoding standardization, provides information about the description and purpose of Emergency Wreck Marking Buoys and recommendations on promulgation of the laying of these buoys through Notices to Mariners.

Clause 12.4.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57 Appendix B.1, Annex A) provides ENC encoding guidance for buoys.

Encoders should note the following:

If it is required to encode an IALA Emergency Wreck Marking Buoy, it must be done using a **BOYSPP** object, with attributes **CATSPM** = 27 (general warning mark), **BOYSHP** = 4 (pillar) or 5 (spar), **COLOUR** = 5,6 (blue),(yellow) and **COLPAT** = 2 (vertical stripes). The buoy must also have the following accompanying equipment objects encoded:

- A **LIGHTS** object, with attributes **COLOUR** = 5,6 (blue),(yellow), **LITCHR** = 17 (occulting alternating), **SIGGRP** = (1) and **SIGPER** = 3. The attribute **SIGSEQ** should be

populated as $1.00+(0.50)+1.00+(0.50)$ and the attribute VALNMR should be populated as 4.

- A **TOPMAR** object, with attribute TOPSHP = 8 (upright cross (St George's cross)). The attribute COLOUR should be populated as 6 (yellow).

Emergency Wreck Marking Buoys may also be fitted with a Racon which must be encoded using a **RTPBCN** object, with attributes CATRTB = 2 (racon, radar transponder beacon) and SIGGRP = (D).

[Jan 2008]

EB20 - ENC PS Clause 5.6 File naming: Use of _ (underscore)

Compulsory – Existing ENCs to be reviewed

Clause 5.6 of edition 2.0 (November 2000) of the ENC Product Specification (S-57 Appendix B.1) is not prescriptive as to the characters allowed for ENC data set file naming, resulting in some ECDIS rejecting ENC files containing the _ (underscore) character in the file name. The S-57 Maintenance Document MD8 (March 2002) lists both a Clarification (1.Cl.37) and a Correction (1.Co.32) explaining the allowable character format to be as described in ISO 9660, level 1. The existence of both a Clarification and a Correction in MD8 has resulted in confusion as to whether the _ (underscore) character is allowable in S-57 Edition 3.1 file names.

Encoders should note, therefore, that ENC data set file names must be composed from the upper case alphanumeric characters A to Z and the digits 0 to 9 only. The use of any other character, such as _ (**underscore**) is prohibited.

[Jan 2008]

EB21 - External text files in national language

Recommended

Within S-57 Edition 3.1 there is no specification on the character encoding of external text files referenced by the attributes TXTDSC and NTXTDS. For external files referenced by the attribute NTXTDS, encoders are creating text files using local character encoding that may not be interpreted correctly by an ECDIS and therefore not readable by the user.

Encoders are strongly advised to encode national text files using the same character encoding used for the **NATF** field as defined in **S-57 Part 3 clause 2.4**. This means that the encoding of the characters in text files must match the encoding of other textual national attributes (e.g. **NOBJNM**, **NINFOM**) within the data set.

[Jan 2008]

EB22 - ENC PS Clause 5.4.1 Content of the exchange set

Compulsory – Safety of navigation – Existing ENCs to be reviewed

Clause 5.4.1 of Edition 2.1 (April 2002) of edition 2.0 (November 2000) of the ENC Product Specification (S-57 Appendix B.1) specifies the content of an ENC exchange set, including the option to include text and picture files. The Clause mandates the use of ASCII text and TIF as

the format to be used for these files, but states additionally that “Files in other formats (including application files that may be used to manipulate text or picture files) may be included in an exchange set by private agreement between the producer and the receiver”. Additionally, Clause 5.6.4 Text and picture files also mandates the use of ASCII text and TIF file formats for text and picture files, but states additionally “Files in other formats, provided through private agreements, should follow the same general naming convention and use the appropriate file extension to indicate their format”. Clause 2.3 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57 Appendix B.1, Annex A) also mandates the use of ASCII text format for files accessed by the TXTDSC and NTXTDS attributes.

Many Type Approved ECDIS’s have been developed to accept only ASCII text and TIF files when generating the SENC as mandated in the ENC PS. This has resulted in these ECDIS’s failing to load text and picture files in formats other than .TXT and .TIF.

Encoders are therefore advised that, when creating ENC exchange sets for general navigational distribution, to include text and picture files **only in text (.TXT) format for text files and TIF (.TIF) format for picture files.**

Text and picture files in formats other than .TXT and .TIF should only be distributed in ENC exchange sets where a private agreement has been made with every ECDIS provider to utilise these alternative formats.

[April 2008]

EB23 - UOC Clause 5.4.1 Geo object depth areas

Recommended

Clause 5.4.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57 Appendix B.1, Annex A) provides guidance on the encoding of depth areas. Included in this guidance is advice related to the encoding of depth areas of type line, in order to “ensure the continuity of the line making up the safety contour on an ECDIS, taking into account the requirement of S-52 that a safety contour should be displayed to enable the mariner to clearly see the dividing line between safe and unsafe water.”

Edition 3.4 (January 2008) of the IHO Presentation Library (S-52 Appendix 2, Edition 4.3 – IHO Colour and Symbol Specifications for ECDIS, Annex A) no longer requires the encoding of depth areas of type line in order to display the safety contour on an ECDIS. Accordingly, the IHO Colours and Symbols Maintenance Working Group has advised that there is no longer a requirement to encode depth areas of type line in ENCs.

Encoders are advised that as of 01 January 2009, it is no longer required to encode depth areas of type line in ENCs in order to ensure continuity of the safety depth in ECDIS.

For existing ENC cells, ECDIS display will not be affected by the retention of depth areas of type line.

For ENCs encoded without depth areas of type line, errors or warnings resulting from S-58 (Recommended ENC Validation Checks – Edition 3, February 2007) relating to depth areas of type line should be ignored.

[December 2008]

EB24 - UOC Clause 2.1.5.1 Seasonal objects and Clause 2.6.1 Issuing updates in advance

Recommended

Clause 2.1.5.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57 Appendix B.1, Annex A) provides guidance on the use of the attributes PEREND and PERSTA for the encoding of seasonal objects in ENC. Clause 2.6.1 of the Use of the Object Catalogue for ENC provides guidance on the provision of advance update information, including the use of the attributes DATEND and DATSTA.

New tests introduced in Edition 3 (2008) of International Electrotechnical Commission document IEC 61174 - Marine Navigation and Radiocommunication Equipment and Systems – Electronic Chart Display and Information Systems (ECDIS) – Operational Performance Requirements, Methods of Testing and Required Test Results, have resulted in the implementation of the use of these time varying attributes by ECDIS manufacturers in their ECDIS systems.

S-57 Appendix A, Chapter 1 – IHO Object Catalogue contains the list of allowable attributes for S-57 Object Classes. For some navigational aid equipment objects the following time varying attributes are not included in the allowable list:

FOGSIG – PEREND, PERSTA;

RADSTA – PEREND, PERSTA;

RETRFL – DATEND, DATSTA, PEREND, PERSTA;

RTPBCN – PEREND, PERSTA;

TOPMAR – DATEND, DATSTA, PEREND, PERSTA.

Additionally, there are no definitive instructions in S-52 for the implementation of the Master / Slave relationship in ECDIS in order to apply the time varying attributes to these equipment objects by association.

As a result of the above, navigation aids encoded using PEREND and PERSTA for seasonality, or DATEND and DATSTA for advance update information, may be adversely displayed in the ECDIS, i.e. a navigation aid equipment object may appear/disappear or remain on the ECDIS display erroneously. This may result in a loss of confidence in the ECDIS by the mariner.

Encoders are therefore advised that where a seasonal or periodic navigation aid contains at least one of the equipment objects FOGSIG, RADSTA, RETRFL, RTPBCN or TOPMAR, the time varying attributes PEREND and PERSTA should not be populated for any object comprising the navigation aid. To indicate seasonality for such navigation aids to the mariner, the attributes STATUS = 5 (periodic/intermittent) and INFORM containing details of the period should be populated.

Where a navigation aid contains one of the equipment objects RETRFL or TOPMAR, advance update information should not be issued. Therefore the attributes DATSTA or DATEND should not be populated for any object comprising the navigation aid. An update applying the temporal change to the navigation aid should be issued as close as possible to the date of the change.

Alternatively, if time varying attributes DATSTA and/or DATEND have been populated for components of a navigation aid that contains at least one of the equipment objects RETRFL or TOPMAR, a separate update applying the temporal change to these equipment objects should be issued as close as possible to the date of the change.

[April 2009]

EB25 - UOC Clause 10.2.1 Traffic separation schemes

Recommended

Clause 10.2.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57

Appendix B.1, Annex A) provides guidance for the encoding of traffic separation schemes (TSS) and each component within a TSS. It is important that mariners be provided with advance notification of changes to TSS, which may include modification to an existing TSS, addition of a new TSS or removal of a TSS. UOC Clause 2.6.1 provides guidance on issuing ENC updates in advance, including the use of the attributes DATEND and DATSTA for objects within an ER data set to indicate when changes to a routeing measure come into force.

Encoders are advised that, in order to provide a consistent approach to mariners regarding advance notification of changes to a traffic separation scheme, the following procedure should be adopted:

1) At least one month before the changes to the TSS come into force, issue an updated data set (as an update or a new edition) which:

- **Adds new or amended TSS component objects (except some navigation aids – see Note below). These objects must have DATSTA populated with the date that the changes to the TSS come into force.**
- **Adds DATEND (populated with the date of the day before the changes to the TSS come into force) to any component objects of the existing TSS that are to be changed or deleted (except some navigation aids – see Note below).**
- **Creates a CTNARE area object covering the geographic extent of both the current and the future TSS. The attribute INFORM or TXTDSC must be used to explain the change to the TSS, e.g. “The traffic separation scheme off Cape Bon is to be modified at 0000 UTC on 1 July 2009. This ENC includes all the information before and after the change, indicated by the attributes DATEND (before the change) and DATSTA (after the change) on the components of the scheme”. The attribute DATEND for the CTNARE should be populated with the date at which the change comes into force or, if encoders wish to provide extended information to the mariner that a change has been made, with a date up to a month after the change comes into force. If the current and the future TSS are not in the same geographic area, it may be required to encode two distinct CTNARE area objects. A picture file may be referenced by a M_NPUB object sharing the same geometry as the CTNARE using the attribute PICREP if it is considered useful, e.g. the equivalent paper chart representation of the amended or new TSS.**

Note: The attributes DATEND and DATSTA are not allowed for navigation aid equipment objects RETRFL and TOPMAR. For any changes to TSS that effect these objects, a separate updated data set (as an update) including changes to those navigation aids which contain any of these equipment objects should be issued as close as possible to the date that the modified/new/deleted TSS comes into force. See also ENC Encoding Bulletin Number 24.

2) As soon as possible after the modified/new/deleted TSS comes into force, issue an updated data set (as an update or new edition) which:

- **Deletes the changed or redundant component objects of the former TSS.**
- **Removes the attribute DATSTA from the component objects of the new TSS.**

3) The CTNARE (and M_NPUB if encoded) must also be removed by update, either as part of the update to remove the redundant component objects of the former TSS, or as a separate update at a later date, corresponding to the date populated in the attribute DATEND for the CTNARE.

Encoders who are members of RENCs should also provide advance notification of changes to TSS to their RENC in accordance with RENC procedures, in order for the RENC to provide additional notification to mariners of impending TSS changes.

[April 2009]

EB26 - UOC Clause 12.8.6.1 Sector lights

Recommended

Evolving technology in the development of navigational lights has resulted in the installation of complex directional navigation lights with multiple sectors, colours and characteristics, some with oscillating sectors, in many areas where navigation is restricted. These lights may have up to 7 sectors, with the central sector being a very narrow, sometimes intensified, fixed white sector performing the directional function of the light. In the IALA A System, the sectors flanking this directional light may be alternating and oscillate increasingly from white to green (to starboard) and red (to port) with increasing deviation from the track defined by the directional light. These lights will normally be flanked by narrow sectors of fixed green (to

starboard) and red (to port). Additionally, there may be outer sectors that are occulting green (to starboard) and red (to port) which oscillate with increasing period of eclipse to isophased or flashing with increasing deviation from the track defined by the directional light. For the IALA B System the colours are reversed. In some cases these complex lights may not conform to IALA. Each of the outer sectors may be very narrow.

Clause 12.8.6.1 of Edition 2.1 (April 2002) of the Use of the Object Catalogue (S-57 Appendix B1, Annex A) provides guidance for the encoding of sector lights: “Each sector in which the light is visible from seaward must be encoded as one **LIGHTS** object”. While guidance is provided for the encoding of a directional light (see also ENC Encoding Bulletin 9) and other conventional light sectors, there is currently no guidance for the encoding of oscillating light sectors.

Encoders should note that where it is required to encode an oscillating light sector, it should be done as follows:

For lights in the IALA A system that are alternating and oscillate increasingly from white to green (to starboard) and red (to port) with increasing deviation from the track defined by the directional light:

LIGHTS: LITCHR = 28 (Alternating); COLOUR = 1,2 (White, Red); SECTR1; SECTR2; SIGPER; SIGGRP; INFORM = White phase decreases as bearing to light increases

LIGHTS: LITCHR = 28 (Alternating); COLOUR = 1,4 (White, Green); SECTR1; SECTR2; SIGPER; SIGGRP; INFORM = White phase increases as bearing to light increases

For lights in the IALA B system that are alternating and oscillate increasingly from white to red (to starboard) and green (to port) with increasing deviation from the track defined by the directional light; transpose the colours red and green in the above encoding.

For lights in the IALA A system that are occulting green (to starboard) and red (to port) which oscillate with increasing period of eclipse to isophased or flashing with increasing deviation from the track defined by the directional light:

LIGHTS: LITCHR = 8 (Occulting); COLOUR = 3 (Red); SECTR1; SECTR2; SIGPER; SIGGRP; INFORM = Light phase decreases as bearing to light increases

LIGHTS: LITCHR = 8 (Occulting); COLOUR = 4 (Green); SECTR1; SECTR2; SIGPER; SIGGRP; INFORM = Light phase increases as bearing to light increases

For lights in the IALA B system that are occulting red (to starboard) and green (to port) which oscillate with increasing period of eclipse to isophased or flashing with increasing deviation from the track defined by the directional light; transpose the colours red and green in the above encoding.

Oscillating lights which are not IALA should be encoded similar to the above. For instance, where a light contains white sectors that are occulting and oscillate with increasing period of eclipse to isophased or flashing with increasing deviation from the track defined by the directional light:

For the sector to port of the track defined by the directional light:

LIGHTS: LITCHR = 8 (Occulting); COLOUR = 1 (White); SECTR1; SECTR2; SIGPER; SIGGRP; INFORM = Light phase decreases as bearing to light increases

For the sector to starboard of the track defined by the directional light:

LIGHTS: LITCHR = 8 (Occulting); COLOUR = 1 (White); SECTR1; SECTR2; SIGPER; SIGGRP; INFORM = Light phase increases as bearing to light increases

[April 2009]

EB27 - UOC Clause 5.3 Soundings

Compulsory – Safety of navigation – Existing ENC's to be reviewed

Clause 5.3 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC (S-57 Appendix B.1, Annex A) provides guidance for the encoding of soundings, including the allowable use of the attribute EXPSOU to indicate whether the “value of sounding” is within or not within the range of depth of the surrounding depth area. This allows a **SOUNDG** object having a shoaler “value of sounding” than the depth area in which it lies, to be encoded on an ENC. The object class **SOUNDG** is not a base display object in the ECDIS Presentation Library, therefore it is possible for soundings shoaler than a vessels safety depth, as set on the ECDIS, to exist in the navigable area but not be displayed when using some ECDIS display settings. This may result in a potential hazard to navigation being undetected by the mariner.

Encoders are advised, therefore, to use caution when considering the population of EXPSOU = 2 (shoaler than the range of depth of the surrounding depth area) for SOUNDG objects, as SOUNDG objects will not be displayed when utilising some ECDIS display settings. Where it is considered that a sounding that is shoaler than the range of depth of the surrounding depth area may be a hazard to navigation, encoders should preferably conduct further investigation of source material in order to encode additional depth contour and depth area information more relevant to the sounding. Alternatively, encoders may consider using an alternate object class (e.g. OBSTRN) to encode the depth.

[April 2009]

EB28 - ENC PS Clause 3.5.7 New attribute values in Edition 3.1

Recommended

Clause 3.5.7 of Edition 2.0 (November 2000) of the ENC Product Specification (S-57 Appendix B.1) provides guidance on the encoding of the attribute INFORM to describe the meaning for attribute values which appear for the first time in S-57 Edition 3.1, for reasons of backward compatibility with S-57 Edition 3.0.

Similarly, clauses 3.3.1, 3.5.2.1 and 3.5.7.1 in section 4 of S-57 Supplement No. 2 (Edition 3.1.2) provide guidance on the encoding of the attribute INFORM to describe the meaning for objects and attribute values which appeared for the first time in S-57 Supplement No. 1 (Edition 3.1.1).

Edition 3.4 (January 2008) of the IHO Presentation Library (S-52 Appendix 2, Edition 4.3 – IHO Colour and Symbol Specifications for ECDIS, Annex A) no longer requires the encoding of INFORM where these objects and attribute values are populated.

Encoders are advised that as of 01 January 2009, it is no longer required to populate INFORM on feature objects to describe the meaning of new objects and attribute values appearing for the first time in S-57 Edition 3.1 or Supplement No. 1 (Edition 3.1.1 – superseded by Supplement No. 2 (Edition 3.1.2) in June 2009).

For existing ENC cells, ECDIS display will not be affected by the retention of populated values for INFORM.

For ENC's encoded without such populated values of INFORM, errors or warnings resulting from S-58 (Recommended ENC Validation Checks – Edition 3, February 2007) relating to missing values of INFORM should be ignored.

[June 2009]

Recommended

Clause 3.3, Table 3.1 of Edition 2.0 (November 2000) of the ENC Product Specification (S-57 Appendix B.1) lists those object classes allowed in an ENC and the geometric primitives allowed for each of them.

Edition 3.4 (January 2008) of the IHO Presentation Library (S-52 Appendix 2, Edition 4.3 – IHO Colour and Symbol Specifications for ECDIS, Annex A) contains Look-Up Tables that map S-57 object classes and associated geometric primitives to S-52 symbols for display in ECDIS.

It has been identified that there are some ENC feature object classes and associated geometric primitives that do not have entries in the S-52 Look-Up Tables, and therefore will not display on an ECDIS. At the joint IHO Transfer Standards Maintenance and Applications Development (TSMAD) Working Group and Colours and Symbols Maintenance Working Group (CSMWG) meeting in 2008, those object classes that do not display in ECDIS were discussed and it was agreed that there was no requirement to symbolise some of these due to there being no relevance to safety of navigation in an ECDIS, and/or encoding of these objects using the particular geometric primitive is illogical for ENC.

Encoders are advised that the following ENC object classes and associated geometric primitives will not display in ECDIS:

BRIDGE (of type Point);

DAMCON (of type Point) – Attribute CATDAM = 1, 2;

GRIDRN (of type Point);

PIPSOL (of type Point);

RAPIDS (of type Point);

ROADWY (of type Point);

RUNWAY (of type Point);

TUNNEL (of type Point);

VEGATN (of type Point) – Attribute CATVEG = 1, 10, 11, 12;

WATFAL (of type Point);

SLOGRD (of type Area) – Attributes CATSLO = 1, 2, 3, 4, 5, 7; CONRAD ≠ 1; and

VEGATN (of type Area) – Attribute CATVEG = 1, 10, 11, 12.

Encoders wishing to display these objects in ECDIS must consider alternative encoding options (e.g. using LNDMRK, OBSTRN, SLCONS).

The following ENC object classes and associated geometric primitives do not currently display in ECDIS, but will be incorporated into Edition 3.4 of the ECDIS Presentation Library through Colour and Symbol Maintenance Document No 7:

CHKPNT (of type Point);

CURRENT (of type Point) – Attribute ORIENT = [Empty (null) value];

PRDARE (of type Point) – Attribute CATPRA = 2, 3, 4, 7, 10;

SMCFAC (of type Point);

VEGATN (of type Point) – Attribute CATVEG = 3, 4, 5, 6, 7, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22; and

SLOGRD (of type Area) – Attributes CATSLO = 1, 2, 3, 4, 5, 7; CONRAD = 1.

[June 2009]

EB30 - UOC Clause 12.8.7 Various special types of lights

Compulsory – Safety of navigation – Existing ENC's to be reviewed

Table 12.5 in Clause 12.8.7 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC provides guidance on encoding various special types of lights in ENC, including strip lights.

It has been reported that in some cases, strip lights are being utilised as aids to navigation. Where strip lights have been encoded in accordance with Clause 12.8.7 of the UOC, the portrayal procedures in the IHO ECDIS Presentation Library do not allow for the light description to be displayed as for other navigational lights in certain ECDIS display modes.

Encoders are therefore advised that where an encoded strip light serves the purpose of an aid to navigation, the attribute CATLIT = 9 (strip light) for the LIGHTS object should not be populated. To identify that the aid to navigation is a strip light, the attribute INFORM should be populated with "Strip light" or equivalent for the LIGHTS.

[June 2009]

EB31 - ENC PS Clause 5.7 Updating and UOC Clause 2.6 Updating

Recommended

Clause 5.7 of Edition 2.0 (November 2000) of the ENC Product Specification (S-57 Appendix B.1) and Clause 2.6 of Edition 2.1 (April 2002) of the Use of the Object Catalogue for ENC provide guidance on encoding, and the method of issuing, ENC updates. This guidance does not include advice on recommended maximum cell size for ENC updates, or whether it is allowable to publish an ENC update that changes the limit of data coverage for an ENC cell.

New tests introduced in Edition 3 (2008) of International Electrotechnical Commission document IEC 61174 - Marine Navigation and Radiocommunication Equipment and Systems – Electronic Chart Display and Information Systems (ECDIS) – Operational Performance Requirements, Methods of Testing and Required Test Results, include instruction that an update must be rejected if its extent goes beyond the base cell limit.

It has also been reported that some ECDIS experience problems in loading large update data sets.

Encoders are therefore advised that an ENC update (ER application profile) data set must not change the limit of data coverage for the base ENC cell, as the update may be rejected by the ECDIS. Where the limit of data coverage for a base ENC cell is to be changed, this should be done by issuing a new edition of the cell.

Encoders are further advised that, as a guide, an ENC update should not exceed 50 Kilobytes in size, as some ECDIS experience problems with loading large update data sets.

[June 2009]

EB32 - UOC Clause 6.2.1 Wrecks

Compulsory – Safety of navigation – Existing ENC's to be reviewed

The IHO Chart Standardisation and Paper Chart Working Group (CSPCWG) is conducting a full review of IHO Publication M-4 – Regulations of the IHO for International (INT) Charts and Chart Specifications of the IHO. As part of the review, Clause B-422 relating to wrecks has been updated in Edition 3.005 to provide additional guidance for depicting more quantitative information regarding wrecks on charts, as distinct from only classifying “dangerous” and “non-dangerous” wrecks.

The provision of more quantitative information for wrecks where possible is particularly important in terms of the portrayal of wrecks in ECDIS. Conditional Symbology Procedures in the IHO Specifications for Chart Content and Display Aspects of ECDIS (S-52) Appendix 2, Annex A – ECDIS Presentation Library, do not take into account the classification of wrecks as “dangerous” or “non-dangerous” when symbolising. This often results in wrecks being symbolised as an obstruction to navigation where they are actually non-dangerous.

Encoders should note that when encoding a WRECKS object, the attributes populated should adhere to the guidance in M-4 Clause B-422, in addition to UOC Table 6.2 as amended by ENC Encoding Bulletin Number 6. Where possible, this includes the population of the attributes VALSOU and QUASOU where the depth of a wreck is known, or the depth is unknown but an estimated safe clearance can be determined. Where the depth is known, or the depth is unknown but an estimated safe clearance has been determined, it is not required to populate the attribute CATWRK = 1 (non-dangerous wreck) or 2 (dangerous wreck), as the mariner has the quantitative information in order to determine whether the wreck may be dangerous to their type of vessel.

[June 2009]