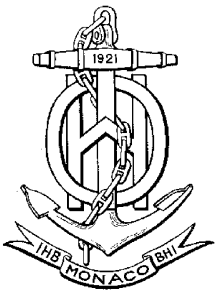
INTERNATIONAL HYDROGRAPHIC ORGANIZATION



IHO TRANSFER STANDARD
for
DIGITAL HYDROGRAPHIC DATA

Publication S-57

Supplementary Information for the Encoding of S-57 Edition 3.1 ENC Data

(S-57 Supplement No. 3)

June 2014

S-57 Supplement 3 incorporates the contents of S-57 Supplement 2.
Supplement 3 therefore supersedes Supplement 2.

The use of S-57 edition 3.1 in conjunction with Supplement 3 results in S-57 Edition 3.1.3.

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1. Introduction to S-57 Edition 3.1 Supplement No. 3

Supplement 3 promulgates several minor additions and changes to S-57 Edition 3.1.

Supplement 3 incorporates the contents of Supplement 2. Supplement 3 therefore supersedes Supplement 2.

This supplementary addition to S-57 comprises:

from Supplement 1	- Three new feature object classes;
from Supplement 1	- Three new attributes;
from Supplement 1	- Two new attribute values for Category of Restricted Area;
from Supplement 2	- Addition of temporal attributes to navigation aid equipment object classes FOGSIG, RADSTA, RETRFL, RTPBCN and TOPMAR;
from Supplement 2	- Changes to the definitions for the enumerates of the attribute CATZOC; and
new in Supplement 3	- New paragraphs added on conformance to S-58 Validation Checks and removal of the DEPARE Line primitive. Clause added to prohibit the reuse of cell names for base cells. Minor changes to class names have been made to be consistent with other objects.

Part 5 as contained in Supplement 2 has been removed as a consequence of the reopening of S-57 Appendix B.1 Annex A - Use of the Object Catalogue for ENC.

This document is structured so that its contents may be easily used in conjunction with the existing S-57 Edition 3.1. It contains pages describing the various changes to S-57 Edition 3.1 as well as numbered sections corresponding to the relevant sections of the ENC Product Specification (Edition 2.0). For ease of use, red text is used to highlight the new changes introduced since S-57 Edition 3.1 Supplement 2. Where required, additional editorial changes have been applied to align with current conventions (e.g. for references “M-4” has been amended to “S-4”).

The use of S-57 Edition 3.1 in conjunction with Supplement 3 results in S-57 Edition 3.1.3.

Enhancements implemented in the superseded Supplement 2 remain optional for ENC producers.

The rationale for issuing these enhancements is explained in IHO Circular Letters 94 of 2005 and 32 of 2009.

2. S-57 Supplement No. 3 Appendix A Chapter 1 - *(IHO Object Catalogue)*

2.1. Correction to Object Class – Fog signal

The attributes PEREND and PERSTA have been added to object class Fog signal.

GEO OBJECT CLASSES

Object Class: **Fog signal**

Acronym: **FOGSIG** Code: **58**

Set Attribute_A: CATFOG; DATEND; DATSTA; NOBJNM; OBJNAM; **PEREND; PERSTA**; SIGFRQ; SIGGEN; SIGGRP; SIGPER; SIGSEQ; STATUS; VALMXR;

Set Attribute_B: INFORM; NINFOM; NTXTDS; SCAMAX; SCAMIN; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

A warning signal transmitted by a vessel, or aid to navigation, during periods of low visibility. Also, the device producing such a signal. (IHO Dictionary, S-32, 5th Edition, 1890)

References:

INT 1: R 1, 10-16, 20-22;

S-4: B-452-454;

Remarks:

Distinction: signal station, warning;

2.2. Correction to Object Class – Radar station

The attributes PEREND and PERSTA have been added to object class Radar station.

GEO OBJECT CLASSES

Object Class: **Radar station**

Acronym: **RADSTA** Code: **102**

Set Attribute_A: CATRAS; COMCHA; DATEND; DATSTA; HEIGHT; NOBJNM; OBJNAM; **PEREND; PERSTA**; STATUS; VALMXR; VERACC; VERDAT;

Set Attribute_B: INFORM; NINFOM; NTXTDS; SCAMAX; SCAMIN; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

A station with a transmitter emitting pulses of ultra-high frequency radio waves which are reflected by solid objects and are detected upon their return to the sending station. (International Maritime Dictionary, 2nd Ed.)

References:

INT 1: M 30; S 1;

S-4: B-485.1; 487.3;

Remarks:

The object ‘radar station‘ is used to encode the technical equipment itself independent of the building or structure where it is installed. This building or structure, e.g. mast, tower, building, radar dome is a different object.

Distinction: radar line; radar range; radar transponder beacon;

2.3. Correction to Object Class – Retro-reflector

The attributes DATEND, DATSTA, PEREND and PERSTA have been added to object class Retro-reflector.

GEO OBJECT CLASSES

Object Class: **Retro-reflector**

Acronym: **RETRFL** Code: **113**

Set Attribute_A: COLOUR; COLPAT; **DATEND**; **DATSTA**; HEIGHT; MARSYS; **PEREND**; **PERSTA**; STATUS; VERACC; VERDAT;

Set Attribute_B: INFORM; NINFOM; NTXTDS; SCAMAX; SCAMIN; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

A means of distinguishing unlighted marks at night. Retro-reflective material is secured to the mark in a particular pattern to reflect back light. (Adapted from the UKHO NP735, 5th Edition).

References:

INT 1: not specified;

S-4: not specified;

Remarks:

The body carrying the retro-reflector is a separate object.

Distinction: beacon, cardinal; beacon, isolated danger; beacon, lateral; beacon, safe water; beacon special purpose/general; buoy, cardinal; buoy, installation; buoy, isolated danger; buoy, lateral; buoy, safe water; buoy, special purpose/general; radar reflector;

2.4. Correction to Object Class – Radar transponder beacon

The attributes PEREND and PERSTA have been added to object class Radar transponder beacon.

GEO OBJECT CLASSES

Object Class: **Radar transponder beacon**

Acronym: **RTPBCN** Code: **103**

Set Attribute_A: CATRTB; DATEND; DATSTA; NOBJNM; OBJNAM; **PEREND**; **PERSTA**; RADWAL; SECTR1; SECTR2; SIGGRP; SIGSEQ; STATUS; VALMXR;

Set Attribute_B: INFORM; NINFOM; NTXTDS; SCAMAX; SCAMIN; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

A transponder beacon transmitting a coded signal on radar frequency, permitting an interrogating craft to determine the bearing and range of the transponder. Also called racon. (IHO Dictionary, S-32, 5th Edition, 4137)

References:

INT 1: S 2-3;

S-4: B-486;

Remarks:

The object class ‘radar transponder beacon’ is only used to encode the technical equipment independent of the structure on which it is located (e.g. a beacon, light-vessel or tower).

Distinction: radar line; radar range; radar station;

2.5. Correction to Object Class – Topmark

The attributes PEREND and PERSTA have been added to object class Topmark.

GEO OBJECT CLASSES

Object Class: **Topmark**

Acronym: **TOPMAR** Code: **144**

Set Attribute_A: COLOUR; COLPAT; **DATEND**; **DATSTA**; HEIGHT; MARSYS; **PEREND**; **PERSTA**; STATUS; TOPSHP; VERACC; VERDAT; VERLEN;

Set Attribute_B: INFORM; NINFOM; NTXTDS; PICREP; SCAMAX; SCAMIN; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

A characteristic shape secured at the top of a buoy or beacon to aid in its identification. (IHO Dictionary, S-32, 5th Edition, 5548)

References:

INT 1: Q 9;

S-4: B-463; 467

Remarks:

The body carrying the topmark is a separate object.

Distinction: beacon, cardinal; beacon, isolated danger; beacon, lateral; beacon, safe water; beacon special purpose/general; buoy, cardinal; buoy, installation; buoy, isolated danger; buoy, lateral; buoy, safe water; buoy, special purpose/general; daymark;

The following new object classes have been included in order to encode Archipelagic Sea Lanes.

2.6. New Object Classes - Archipelagic Sea Lane

GEO OBJECT CLASSES

Object Class: **Archipelagic Sea Lane**

Acronym: **ARCSLN** Code: **161**

Set Attribute_A: DATEND; DATSTA; NATION; NOBJNM; OBJNAM;

Set Attribute_B: INFORM; NINFOM; NTXTDS; PICREP; SCAMAX; SCAMIN; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

Article 53 of the United Nations Convention on the Law of the Sea (UNCLOS) states that:

> 'an archipelagic State may designate sea lanes ..., suitable for the continuous and expeditious passage of foreign ships ... through ... its archipelagic waters and the adjacent territorial sea. ... All ships ... enjoy the right of archipelagic sea lanes passage in such sea lanes ... [which] include all normal passage routes used as routes for international navigation … through archipelagic waters'.

(Note: references to aircraft and air routes in UNCLOS have been omitted in these extracts from Article 53). (IHO S-4 B-435.10, C-51 Appendix 2 Part II)

References:

INT 1: M 17;

S-4: B-435.10;

Remarks:

The object class Archipelagic Sea Lane encodes the area of an Archipelagic Sea Lane.

Distinction: administrative area; archipelagic sea lane axis; caution area; fairway; inshore traffic zone; recommended traffic lane part; restricted area; submarine transit lane; traffic separation scheme lane part; traffic separation zone; two-way route part;

2.7. New Object Classes - Archipelagic Sea Lane axis

GEO OBJECT CLASSES

Object Class:	**Archipelagic Sea Lane axis**

Acronym: **ASLXIS** Code: **162**

Set Attribute_A: DATEND; DATSTA; NATION; NOBJNM; OBJNAM;

Set Attribute_B: INFORM; NINFOM; NTXTDS; PICREP; SCAMAX; SCAMIN; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

The reference line used to determine the maximum extents of an Archipelagic Sea Lane. It may not indicate the deepest water nor any recommended route or track.

Article 53 of the United Nations Convention on the Law of the Sea (UNCLOS) states that:

> 'an archipelagic State may designate sea lanes ..., suitable for the continuous and expeditious passage of foreign ships ... through ... its archipelagic waters and the adjacent territorial sea. ... All ships ... enjoy the right of archipelagic sea lanes passage in such sea lanes ... [which] include all normal passage routes used as routes for international navigation … through archipelagic waters'.

(Note: references to aircraft and air routes in UNCLOS have been omitted in these extracts from Article 53). (IHO S-4 B-435.10, C-51 Appendix 2 Part II)

References:

INT 1: M 17;

S-4: B-435.10;

Remarks:

Distinction: administrative area; archipelagic sea lane; caution area; deep water route centreline; fairway; inshore traffic zone; navigation line; recommended route centreline; recommended track; recommended traffic lane part; restricted area; submarine transit lane; traffic separation scheme lane part; traffic separation line; traffic separation zone; two-way route part;

2.8. 'New object' Feature Object Class

The following 'New object' feature object class has been included in order to cater for possible future requirements specified by the IMO and that affect safety of navigation which cannot adequately be encoded by any existing object class. It must not be used unless approved by the Transfer Standard Maintenance and Application Development Working Group (TSMAD) and the Digital Information Portrayal Working Group (DIPWG) and issued as an ENC Encoding Bulletin.

GEO OBJECT CLASSES

Object Class: **New object**

Acronym: **NEWOBJ** Code: **163**

Set Attribute_A: CLSDEF; CLSNAM; COLOUR; COLPAT; CONDTN; CONRAD; CONVIS; DATEND; DATSTA; NATION; NOBJNM; OBJNAM; PEREND; PERSTA; RESTRN; STATUS; WATLEV;

Set Attribute_B: INFORM; NINFOM; NTXTDS; PICREP; SCAMAX; SCAMIN; SYMINS; TXTDSC;

Set Attribute_C: RECDAT; RECIND; SORDAT; SORIND;

Definition:

A new feature specified by the IMO and that affects safety of navigation which cannot adequately be encoded by any existing object class for use in an S-57 data set.

References:

INT 1: not specified;

S-4: not specified;

Remarks:

The 'New object' feature object class has been included in order to cater for possible future requirements of the IMO that affects safety of navigation which cannot adequately be encoded by any existing object class. It must not be used unless approved by the Transfer Standard Maintenance and Application Development Working Group (TSMAD) and the Digital Information Portrayal Working Group (DIPWG) and issued as an ENC Encoding Bulletin.

Distinction: caution area;

3. S-57 Supplement No. 3 Appendix A Chapter 2 - *(Attributes)*

The following new attribute values for Environmentally Sensitive Sea Area (ESSA) and Particularly Sensitive Sea Area (PSSA) have been included for CATREA. The additions are in bold font.

3.1. New Attribute values for CATREA

Attribute: **Category of restricted area**

FEATURE OBJECT ATTRIBUTES

Acronym: **CATREA** Code: **56**

Attribute type: L

Expected input:

ID		Meaning	INT 1	S-4
1	:	offshore safety zone	L 3;	
2	:	~~anchoring prohibition area~~		
3	:	~~fishing prohibition area~~		
4	:	nature reserve	N 22;	
5	:	bird sanctuary	N 22;	
6	:	game reserve	N 22;	
7	:	seal sanctuary	N 22;	
8	:	degaussing range	N 25;	B-448.1-3;
9	:	military area	N 31;	
10	:	historic wreck area	N 26;	B-449.5;
11	:	~~inshore traffic zone~~		
12	:	navigational aid safety zone	M 29.1;	B-435.7;
13	:	~~danger of stranding area~~		
14	:	minefield	N 34;	B-441.8;
15	:	~~diving prohibition area~~		
16	:	~~area to be avoided~~		
17	:	~~Prohibited area~~		
18	:	swimming area		
19	:	waiting area		
20	:	research area		
21	:	dredging area	N 63;	B-446.4;
22	:	fish sanctuary		
23	:	ecological reserve		
24	:	no wake area		
25	:	swinging area		
26	:	water skiing area		
27	**:**	**Environmentally Sensitive Sea Area (ESSA)**	**N 22;**	**B-437.1;**
28	**:**	**Particularly Sensitive Sea Area (PSSA)**	**N 22;**	**B-437.6;**

Definitions:

offshore safety zone: the area around an offshore installation within which vessels are prohibited from entering without permission; special regulations protect installations within a safety zone and vessels of all nationalities are required to respect the zone. (IHO Dictionary, S-32, 5th Edition, 4471)

nature reserve: a tract of land managed so as to preserve its flora, fauna, physical features, etc.

bird sanctuary: a place where birds are bred and protected.

game reserve: a place where wild animals or birds hunted for sport or food are kept undisturbed for private use.

seal sanctuary: a place where seals are protected.

degaussing range: an area, usually about two cables diameter, within which ships' magnetic fields may be measured; sensing instruments and cables are installed on the sea bed in the range and there are cables leading from the range to a control position ashore. (IHO Chart Specifications, S-4)

military area: an area controlled by the military in which restrictions may apply. (Hydrographic Service, Royal Australian Navy)

historic wreck area: an area around certain wrecks of historical importance to protect the wrecks from unauthorized interference by diving, salvage or deposition (including anchoring). (IHO Chart Specifications, S-4)

navigational aid safety zone:
an area around a navigational aid which vessels are prohibited from entering.

minefield: an area laid and maintained with explosive mines for defence or practice purposes.

swimming area: an area in which people may swim and therefore vessel movement may be restricted.

waiting area: an area reserved for vessels waiting to enter a harbour.

research area: an area where marine research takes place.

dredging area: an area where dredging is taking place.

fish sanctuary: a place where fish are protected

ecological reserve: a tract of land managed so as to preserve the relation of plants and living creatures to each other and to their surroundings.

no wake area: an area in which a vessels' speed must be reduced in order to reduce the size of the wake it produces.

swinging area: an area where vessels turn. (Service Hydrographique et Océanographique de la Marine, France).

water skiing area: an area within which people may water ski and therefore vessel movement may be restricted.

Environmentally Sensitive Sea Area (ESSA):
a generic term which may be used to describe a wide range of areas, considered sensitive for a variety of environmental reasons. (IHO Chart Specifications, S-4)

Particularly Sensitive Sea Area (PSSA):
an area that needs special protection through action by IMO because of its significance for regional ecological, socio-economic or scientific reasons and because it may be vulnerable to damage by international shipping activities. (IHO Chart Specifications, S-4)

Remarks:

The official legal status of each kind of restricted area defines the kind of restriction(s), e.g. the restriction for a 'game reserve' may be 'entering prohibited'.

3.2. Correction to Attribute – Category of zone of confidence in data

Changes made to the definitions of the attribute CATZOC

FEATURE OBJECT ATTRIBUTES

Attribute: **Category of zone of confidence in data**

Acronym: **CATZOC** Code: **72**

Attribute type: E

Expected input:

ID		Meaning
1	:	zone of confidence A1
2	:	zone of confidence A2
3	:	zone of confidence B
4	:	zone of confidence C
5	:	zone of confidence D
6	:	zone of confidence U (data not assessed)

Definitions:

See ZOC Table on following page.

ZOC Table:

<table>
<tr><th>1</th><th>2</th><th colspan="2">3</th><th>4</th><th>5</th></tr>
<tr><td>ZOC [1]</td><td>Position Accuracy [2]</td><td colspan="2">Depth Accuracy [3]</td><td>Seafloor Coverage</td><td>Typical Survey Characteristics [5]</td></tr>
<tr><td rowspan="3">A1</td><td rowspan="3">± 5 m + 5% depth</td><td colspan="2">=0.50 + 1%d</td><td rowspan="3">Full area search undertaken. Significant seafloor features detected [4] and depths measured.</td><td rowspan="3">Controlled, systematic survey [6] high position and depth accuracy achieved using DGPS or a minimum three high quality lines of position (LOP) and a multibeam, channel or mechanical sweep system.</td></tr>
<tr><td>Depth (m)</td><td>Accuracy (m)</td></tr>
<tr><td>10
30
100
1000</td><td>± 0.6
± 0.8
± 1.5
± 10.5</td></tr>
<tr><td rowspan="3">A2</td><td rowspan="3">± 20 m</td><td colspan="2">= 1.00 + 2%d</td><td rowspan="3">Full area search undertaken. Significant seafloor features detected [4] and depths measured.</td><td rowspan="3">Controlled, systematic survey [6] achieving position and depth accuracy less than ZOC A1 and using a modern survey echosounder[7] and a sonar or mechanical sweep system.</td></tr>
<tr><td>Depth (m)</td><td>Accuracy (m)</td></tr>
<tr><td>10
30
100
1000</td><td>± 1.2
± 1.6
± 3.0
± 21.0</td></tr>
<tr><td rowspan="3">B</td><td rowspan="3">± 50 m</td><td colspan="2">= 1.00 + 2%d</td><td rowspan="3">Full area search not achieved; uncharted features, hazardous to surface navigation are not expected but may exist.</td><td rowspan="3">Controlled, systematic survey achieving similar depth but lesser position accuracies than ZOCA2, using a modern survey echosounder[5], but no sonar or mechanical sweep system.</td></tr>
<tr><td>Depth (m)</td><td>Accuracy (m)</td></tr>
<tr><td>10
30
100
1000</td><td>± 1.2
± 1.6
± 3.0
± 21.0</td></tr>
<tr><td rowspan="3">C</td><td rowspan="3">± 500 m</td><td colspan="2">= 2.00 + 5%d</td><td rowspan="3">Full area search not achieved, depth anomalies may be expected.</td><td rowspan="3">Low accuracy survey or data collected on an opportunity basis such as soundings on passage.</td></tr>
<tr><td>Depth (m)</td><td>Accuracy (m)</td></tr>
<tr><td>10
30
100
1000</td><td>± 2.5
± 3.5
± 7.0
± 52.0</td></tr>
<tr><td>D</td><td>worse than ZOC C</td><td colspan="2">Worse Than ZOC C</td><td>Full area search not achieved, large depth anomalies may be expected.</td><td>Poor quality data or data that cannot be quality assessed due to lack of information.</td></tr>
<tr><td>U</td><td colspan="4">Unassessed - The quality of the bathymetric data has yet to be assessed</td><td></td></tr>
</table>

Remarks:

To decide on a ZOC Category, all conditions outlined in columns 2 to 4 of the table must be met.

Explanatory notes quoted in the table:

[1] The allocation of a ZOC indicates that particular data meets minimum criteria for position and depth accuracy and seafloor coverage defined in this Table. ZOC categories reflect a charting standard and not just a hydrographic survey standard. Depth and position accuracies specified for each ZOC category refer to the errors of the final depicted soundings and include not only survey errors but also other errors introduced in the chart production process. Data may be further qualified by Object Class 'Quality of Data' (M_QUAL) sub-attributes as follows:

a) Positional Accuracy (POSACC) and Sounding Accuracy (SOUACC) may be used to indicate that a higher position or depth accuracy has been achieved than defined in this Table (e.g. a survey where full seafloor coverage was not achieved could not be classified higher that ZOC B; however, if the position accuracy was, for instance, ± 15 metres, the sub-attribute POSACC could be used to indicate this).

b) Swept areas where the clearance depth is accurately known but the actual seabed depth is not accurately known may be accorded a 'higher' ZOC (i.e. A1 or A2) providing positional and depth accuracies of the swept depth meets the criteria in this Table. In this instance, Depth Range Value 1 (DRVAL1) may be used to specify the swept depth. The position accuracy criteria apply to the boundaries of swept areas.

c) SURSTA, SUREND and TECSOU may be used to indicate the start and end dates of the survey and the technique of sounding measurement.

[2] Position Accuracy of depicted soundings at 95% CI (2.45 sigma) with respect to the given datum. It is the cumulative error and includes survey, transformation and digitizing errors etc. Position accuracy need not be rigorously computed for ZOCs B, C and D but may be estimated based on type of equipment, calibration regime, historical accuracy etc.

[3] Depth accuracy of depicted soundings = a + (b∗d)/100 at 95% CI (2.00 sigma), where d = depth in metres at the critical depth. Depth accuracy need not be rigorously computed for ZOCs B, C and D but may be estimated based on type of equipment, calibration regime, historical accuracy etc.

[4] Significant seafloor features are defined as those rising above depicted depths by more than:

	Depth	Significant Feature
a.	<40 m	2 m
b.	>40 m	10% depth

A full seafloor search indicates that a systematic survey was conducted using detection systems, depth measurement systems, procedures, and trained personnel designed to detect and measure depths on significant seafloor features. Significant features are included on the chart as scale allows. It is impossible to guarantee that no significant feature could remain undetected, and significant features may have become present in the area since the time of the survey.

[5] Typical Survey Characteristics - These descriptions should be seen as indicative examples only.

[6] Controlled, systematic surveys (ZOC A1, A2 and B) - surveys comprising planned survey lines, on a geodetic datum that can be transformed to WGS 84.

[7] Modern survey echosounder - a high precision single beam depth measuring equipment, generally including all survey echosounders designed post 1970.".

3.3. New Attribute – Object class definition

The following new attributes have been included to describe the characteristics for the “New Object” object class.

FEATURE OBJECT ATTRIBUTES

Attribute: **Object class definition**

Acronym: **CLSDEF** Code: **190**

Attribute type: S

Definition:

Specifies the defining characteristics of a ‘new object’.

Remarks:

Identical definitions must be used for other instances of identical features being encoded.

The wording for the attribute CLSDEF must be approved by TSMAD before use.

3.4. New Attribute – Object class name

FEATURE OBJECT ATTRIBUTES

Attribute: **Object class name**

Acronym: **CLSNAM** Code: **191**

Attribute type: S

Definition:

Specifies the descriptive name of a ‘new object’ feature object class.

Remarks:

All ‘new objects’ of the same class must share the same CLSNAM.

The wording for the attribute CLSNAM must be approved by TSMAD before use.

3.5. New Attribute – Symbol instruction

FEATURE OBJECT ATTRIBUTES

Attribute: **Symbol instruction**

Acronym: **SYMINS** Code: **192**

Attribute type: S

Definition:

This specifies the S-52 Presentation Library symbol instruction to be adopted in ECDIS for the new object class (as specified in the S-52 Symbol Library - Addendum to S-52 Presentation Library).

Remarks:

The string for the attribute SYMINS must be approved by DIPWG and TSMAD before use.

Point, simple and complex lines, area or text symbol instructions may be specified. If SYMINS is not populated, a default symbol is provided.

Symbol instructions are explained in the Presentation Library Users' Manual, Part A, sections 3.3 and 7 "DESCRIPTION OF THE SYMBOLOGY INSTRUCTIONS".

Note that the separator between two instructions is the character ';' (semi-colon).

Example:

SYMINS = "SY(CHINFO11);LS(DASH,2,CHMGD)"

4. S-57 Supplement No. 3 Appendix B.1 - *(Product Specifications for ENC)*

The following clauses are supplementary to the "ENC Product Specification" document (Edition 2.0), and were implemented in Edition 3.1.1.

---

3. Objects and Attributes

The following paragraphs are added to this section;

IHO standard S-58 contains validation checks to be used to verify that an ENC meets the requirements laid out in this specification.

ENC cells must meet the minimum validation requirements defined in S-58 in order to conform to this product specification.

3.3 Objects permitted for use in ENC and their geometric primitives

The geometric primitive line is removed for the object class **DEPARE** – table 3.1 is amended as follows;

DEPARE		~~L~~	A	

3.3.1 New object classes and their geometric primitives permitted by this enhancement for use in ENC.

The following is a list of additional object classes allowed in an ENC and the geometric primitives allowed for each of them (P = point, L = line, A = area, N = none).

ARCSLN			A	

ASLXIS		L		

NEWOBJ	P	L	A	

The 'New object' must only be used in conjunction with an ENC Encoding Bulletin issued by the IHO. The Bulletin will provide the specifics on how to use the object class for a particular application. The 'New object' must not be used under any other circumstances.

3.5.2.1 New mandatory attributes

Object Class	Attributes					
ARCSLN	NATION	~~At least one of~~ ~~INFORM or TXTDSC~~				
ASLXIS	NATION	~~At least one of~~ ~~INFORM or TXTDSC~~				
NEWOBJ	CLSDEF	CLSNAM	~~At least one of~~ ~~INFORM or TXTDSC~~			

3.5.8 New attributes

Three new attributes are added and are of type “Free Text”.

CLSDEF
CLSNAM
SYMINS

5.6.3 Data set files

The re-use of cell names is prohibited.

The data set files are named according to the specifications given below :

```
CCPXXXXX.EEE
|  |   |      |
|  |   |      |----- EEE     = update number
|  |   |------------ XXXXX  = individual cell code
|  |------------------ P     = navigational purpose
|--------------------- CC    = producer code
```

The main part forms an eight character identifier where :

- the first two characters identify the producer. This list is given in Annex A to Appendix A (IHO Object Catalogue).
- the third character indicates the navigational purpose (see clause 2.1).
- the fourth to eighth characters are used for the cell code. This code can be used in any way by the producer to provide the unique file name. If characters other than numbers are used only uppercase letters are allowed.

A valid base cell file must be uniquely identified world wide by its name, and have the extension 000. The names of previously cancelled base cell files must not be re-used for subsequent new base cell files.

The extension is used for updating (see clause 5.7).
Update cell files have the same name as the original base cell file, with an extension number greater than or equal to 001. They cover the same geographical area as the base cell file to which they apply.

6.3.2.1 Data Set Identification field – DSID (EN)

The STED subfield content must remain “03.1”.

The PRED subfield content must remain “2.0”.

To indicate that the data set is Edition 3.1.3 data, the text “STED:3.1.3;” must be included in the COMT subfield.

6.4.2.1 Data Set Identification field – DSID (ER)

The STED subfield content must remain “03.1”.

The PRED subfield content must remain “2.0”.

To indicate that the update applies to a 3.1.3 data set, the text “STED:3.1.3;” must be included in the COMT subfield.