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AUSTRALIAN HYDROGRAPHIC SERVICE
MANAGEMENT SYSTEM DOCUMENT

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SPECIFICATION - AUSTRALIAN SCAMIN and ATTRIBUTE POLICY (including ENC CELL COMPILATION SCALE VALUES)

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Version	DESCRIPTION OF CHANGE	Date	Authorised
7	**All changes from previous versions incorporated.**	**17 Feb 14**	**DCS**
	Remove redundant former paragraph (o) (clause 6.8) related to retention of SORIND and SORDAT for ENC cells published prior to 17 February 2014.	20 Oct 14	DDCSS
	Entire clause 8 revised for clarity, and to incorporate change in CPM processes to "ENC first - paper Chart as a derivative".	08 Apr 15	DDCSS
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1. PURPOSE

i) The purpose of this document is to provide specifications and guidance on conventions to be used for the population of the S-57 attribute SCAMIN for ENC cells produced by the Australian Hydrographic Service (AHS). The document also provides additional AHS S-57 attribute population convention, and guidance for attribution of specific S-57 Object Classes, as well as defining ENC cell compilation scale values in relation to paper chart and other source scales.

2. SCOPE

a) This document is applicable to all compilers, reviewers and quality assurance staff involved in the production of official ENCs produced by or on behalf of the AHS.

b) This specification is not applicable to Military Geospatial Intelligence products (Additional Military Layers – AMLs). However, in producing AMLs consisting of additional data overlaid on an otherwise standard ENC, every effort should be made to leave the existing data unaltered, and follow the intent of this document for additional attribute encoding, except where this conflicts with the specific requirements of the AML.

3. REFERENCES

a) This document is to be read in conjunction with the following document:

i) SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC.

ii) SPEC_05_55_AA223480 Australian Charting Specifications.

4. DEFINITIONS

a) Nil.

5. RESPONSIBILITIES

a) **Deputy Director Charting Standards and Specifications (DDCSS)** is responsible for the ongoing maintenance of this specification. Deputy Director Chart Production and Maintenance (DDCPM) is responsible for the adherence of all relevant charts to this specification, and shall provide input to DDCSS on updates to this specification (in consultation with the Charting Technical Working Group (CTWG)). Director of Charting Services (DCS) shall approve updates to this specification.

6. FEATURE ATTRIBUTES

a) Attribute values that cannot be determined from the source must not be populated; unless they are S-57 Mandatory Attributes (refer S-57 Appendix B.1 – ENC Product Specification (Edition 2.0), Table 3.2). Particular care must be taken with the population of "conditional" mandatory attributes (i.e. attributes that are conditional on a real world aspect of the feature (such as its presence over navigable water or resulting from the value of an associated attribute) and attributes shown in the table as "at least one of").

b) As a minimum, the level of attribution for any particular ENC Cell must correspond with the information required for the corresponding paper chart.

6.1 CONVIS

c) Unless CONVIS is specified as mandatory for a particular Object Class (e.g. **LNDMRK**), it must only be populated if the Object is visually conspicuous (CONVIS = *1*).

6.2 CONRAD

d) The attribute CONRAD must only be populated if the Object is radar conspicuous (CONRAD = *1*).

6.3 EXPSOU

e) The value EXPSOU = *1* (within the range of depth of the surrounding area) should not be used, except for **OBSTRN**, **UWTROC** or **WRECKS** objects where the actual depth of the feature (VALSOU) is unknown but is known to be within the range of depth of the surrounding **DEPARE** (refer SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC clauses 6.1.2, 6.2.1 and 6.2.2). In accordance with AUOC clause 5.3, EXPSOU = *2* (shoaler than the range of depth of the surrounding area) must not be populated for **SOUNDG** Objects except in exceptional circumstances and only on approval of DDCPM and DDHPS..

6.4 INFORM

f) See SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC, Clause 2.3.1.

6.5 NOBJNM

g) See SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC, Chapter 14.

h) Compilers experiencing confusion over instances of encoding geographic names for particular geographic features should refer the issue to the MIS Section.

6.6 OBJNAM

i) If the object does not have a name or if the name is unknown then the attribute OBJNAM must not be populated unless it is mandatory for the Object Class (in which case it must be populated with an empty (null) value). (Refer to the Nautical Information and Publications Section if unsure). For Traffic Separation Schemes and other routeing schemes such as Two-Way Routes and range systems, the name

must be populated in accordance with SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC clause 10.2.3, with preference given to encoding a **SEAARE**.

j) Where an existing Object is not available on which to encode a Geographic Name, a **SEAARE**, **LNDRGN**, or **ADMARE** Object should be encoded specifically to populate the Name. In all cases where a Geographic Name is encoded in this manner, the position of the name must be reviewed by the MIS Section prior to publication of the ENC Cell. Compilers are to be guided by the position of the name on the source, or the position of the name as indicated on existing paper charts.

k) For additional information on the population of OBJNAM, see SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC, Chapter 14.

6.7 PICREP

l) See SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC, Clause 4.8.20.

6.8 SORDAT and SORIND

m) For all ENC (EN (new cell or new edition) and ER (Update) profile) published from 17 February 2014, the attribute SORDAT must only be populated to indicate:

   i. The reported (year) date for reported features;

   ii. The year of dredging for dredged areas that are not regularly maintained;

   iii. The year of sweeping for swept areas;

   iv. The year or date of works in progress (under construction) or projected;

n) For all ENC (EN (new cell or new edition) and ER (Update) profile) published from 17 February 2014, the attribute SORIND must not be populated.

6.9 STATUS

o) The value STATUS = *1* (permanent) should not be used except in exceptional circumstances.

6.10 TXTDSC

p) See SPEC_05_55_AA34159 Australian Use of the Object Catalogue (AUOC), Clause 2.3.2.

6.11 VERDAT

q) The attribute VERDAT on an individual object must only be used if different to the value of the VDAT subfield in the Data Set Parameter (DSPM) field of the ENC Cell Header, or the value of VERDAT populated for an underlying **M_VDAT** object (refer to AUOC Clause 2.1.2). Special care needs to be shown where the datum used for clearance heights is different to the height datum of the cell (e.g. where height datum is MHHW and clearance heights are referred to HAT).

7. SPATIAL ATTRIBUTES

a) The spatial attributes POSACC and QUAPOS may be used for any S-57 spatial object. The value QUAPOS = *1* (surveyed) should not be used. For objects shown on paper charts as Reported, or reported objects to be inserted via Notices to Mariners Update, the value QUAPOS = *8* (reported (not confirmed)) must be used.

8. ENC CELL COMPILATION SCALE

a) The default ENC Cell Compilation Scale is the value inserted in the CSCL subfield of the Data Set Parameter (DSPM) field within the ENC Cell Header. Discrete areas within an ENC cell can also have a larger Compilation Scale defined through use of the meta Object **M_CSCL** (attribute CSCALE) – refer to SPEC_05_55_AA34159 Australian Use of the Object Catalogue AUOC, clause 2.2.6. For Australian ENCs, the Compilation Scale should be set to a value that provides the best default ECDIS display scale for the mariner appropriate to the Navigational Purpose of the ENC, up to and including 3000000. Values to be used are based on the display of the data in ECDIS conforming to various radar ranges, at a scale so as to be optimally displayed on a "standard" 22 inch screen as specified in the ECDIS Performance Standards. The Compilation Scale is derived by use of the following table:

Selectable Range	Standard scale (rounded)
200 NM	1:3000000
96 NM	1:1500000
48 NM	1:700000
24NM	1:350000
12 NM	1:180000
6 NM	1:90000
3 NM	1:45000
1.5 NM	1:22000
0.75 NM	1:12000
0.5 NM	1:8000
0.25 NM	1:4000

Radar range / standard scale table

b) To determine the Compilation Scale value of a particular ENC Cell, the requirements for navigation appropriate to the Navigational Purpose of the ENC must be assessed, and appropriate value(s) assigned. For instance, if a cell is to be compiled for Navigational Purpose 5, covering a significant (possibly dredged) approach channel; vessel manoeuvring area(s); and berth pockets:

- The default Compilation Scale for the cell (CSCL subfield of the Data Set Parameter (DSPM) field within the ENC Cell Header) may be set to 8000, which is determined as the "best" ECDIS display scale for navigation outside the approach channel.
- For navigation within the approach channel and in the vicinity of the berths, the "best" ECDIS display scale may be determined to be at a scale larger than 1:8000. The resultant Compilation Scale for this area will therefore be assigned through encoding a **M_CSCL** object covering the area, with the appropriate value populated for the attribute CSCALE (e.g. 4000).

c) For areas determined to require a Compilation Scale larger than 1:4000, the allowable values are 1:3000, 1:2000 and 1:1000.

d) Compilation Scale must be determined independently of any requirements for paper Charts. It is important to note for Navigational Purpose 5 ENC's that the only restriction in terms of the area covered and the appropriate Compilation Scale(s) is the 5 Mb ENC cell data size limit.

e) While it is acknowledged internationally that there are no maximum and minimum compilation scales defined for ENC cell Navigational Purposes, there are some general conventions that have been adopted for Australian ENC's of Navigational Purposes 4, 3, 2 and 1 for the value to be populated for the CSCL subfield of the Data Set Parameter (DSPM) field within the ENC Cell Header:

- Navigational Purpose 4 and 3: Where the cell includes any part of the Australian mainland, the value is set to 90000. For offshore coastal cells (including PNG), the value is set to one of 90000, 180000, or (occasionally) 350000. For offshore islands and reefs, the value is set to the most appropriate value for safe coastal or approach navigation – generally no larger than 45000 and no smaller than 180000.
- Navigational Purpose 2: The value is set to 1500000.
- Navigational Purpose 1: The value is set to 3000000.

f) The ENC cell Compilation Scale, including the Compilation Scale for areas of the ENC cell that may be covered by **M_CSCL** objects, must be determined during the ENC Cell Review.

9. AUSTRALIAN PROCEDURE FOR ASSIGNING SCAMIN VALUES

a) Most Group 2 objects will be allocated a SCAMIN value[1], referred to as the Object SCAMIN value. The list of allowable Object SCAMIN values for Australian ENC's are included in the following table. The table consists of columns representing the smallest scale product that an object currently does or would hypothetically appear in; and rows representing the S-57 Object classes. The correct Object SCAMIN value is determined by the relevant column and row intersection.

b) In most cases, Object SCAMIN values must be determined cartographically, **based on the smallest scale product that an Object would appear in**. Exceptions to this are listed in the table. Note that the "smallest scale product" may not actually exist.

c) The Object SCAMIN value should be consistent across all the Navigational Purpose categories an object will appear in (see AUOC Clause 2.2.7 remark number 5).

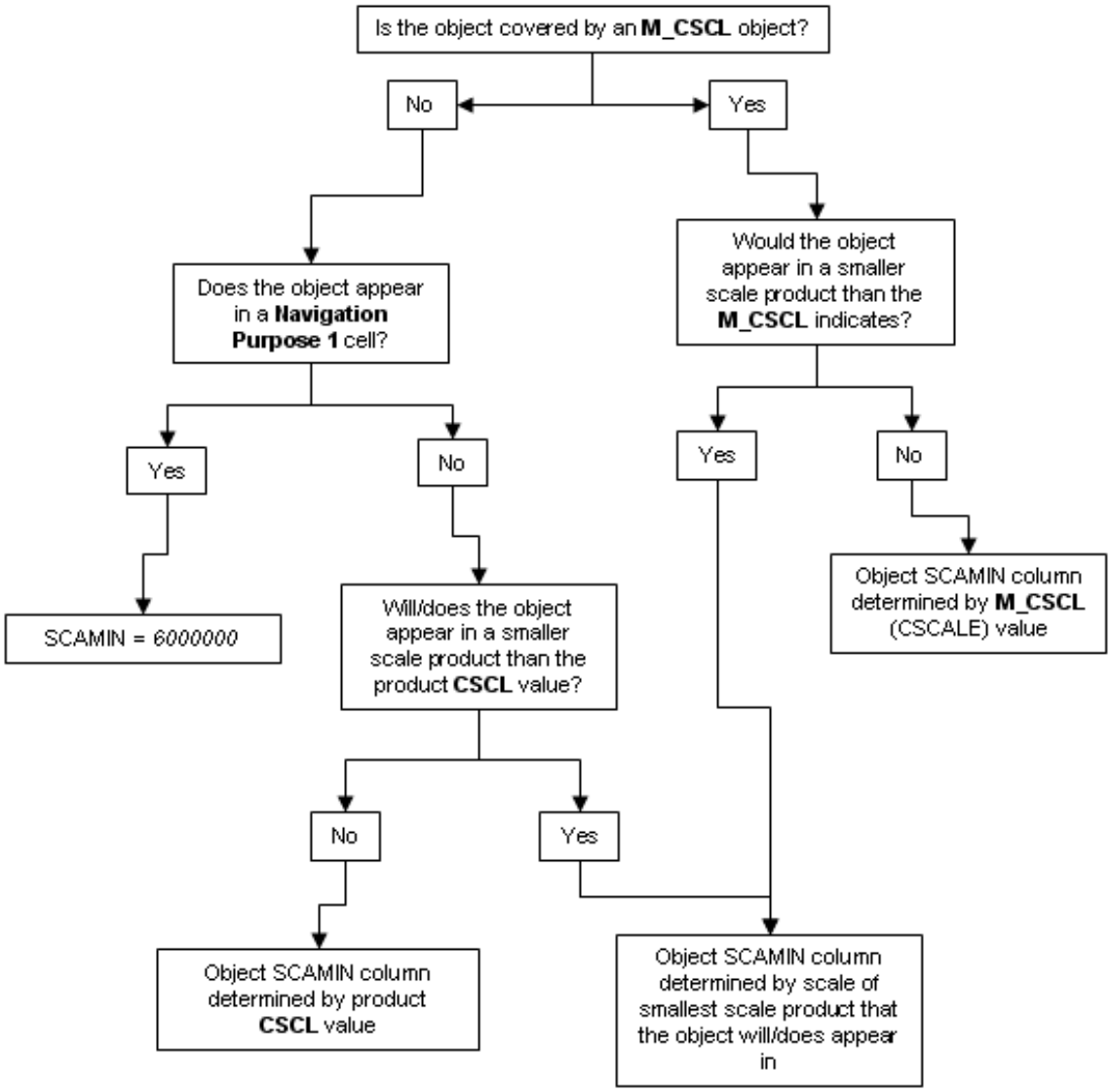
d) **All objects that would appear on a Navigational Purpose 1 ENC cell and which require an Object SCAMIN value must have the value populated as 6000000**. The table below does not contain values to be populated for Navigational Purpose 1 ENCs.

e) ENC cells may contain **M_CSCL** objects indicating a different compilation scale for discrete regions within the cell. Where a **M_CSCL** object exists, the value of the CSCALE attribute for the **M_CSCL** object must be used instead of the ENC cell

[1] SCAMIN values are based on the Standard Scale values shown in clause 8 above. Values are calculated as an AHS ENC Compilation Scale value minus 1.

compilation scale value in determining the largest scale range column in the table from which a SCAMIN value can be assigned to objects covered by the **M_CSCL**.

f) The following figure provides a decision flow chart to assist in selecting the correct Object SCAMIN Value column for individual S-57 objects during ENC compilation. Once the correct SCAMIN column has been selected the SCAMIN value for the relevant S-57 object can be identified.



g) As an example, a sounding in an approach ENC cell (Navigational Purpose 4), covered by a **M_CSCL** with attribute CSCALE = *45000*, that would not appear on any smaller scale product must carry a SCAMIN value of 89999. Another sounding that would also appear on a 1:300000 paper chart (e.g. a significant shoal), even if that product does not exist, must carry a SCAMIN value of 349999 in the approach cell. Both soundings would carry the same SCAMIN value in the Navigational Purpose 5 ENC if the area is covered at that Navigational Purpose. If a sounding also appears in the corresponding 1:3500000 paper chart, or Navigational Purpose 1 ENC cell, it must carry a SCAMIN value of 6000000 across all Navigational Purposes in which it appears.

h) In the table, the following definitions of the terms and abbreviations apply:

i) A: S-57 area type primitive.

ii) L: S-57 line type primitive.

iii) P: S-57 point type primitive.

iv) *: Denotes Group 1 Object.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
ACHARE *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
ACHBRT *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
ACHBRT *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
ADMARE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
AIRARE *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BCNCAR *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BCNISD *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BCNLAT *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BCNSAW *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BCNSPP *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BERTHS *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	Numbered berths must not include the text “No” in OBJNAM. See AUOC clause 4.6.2 for guidance on the population of OBJNAM for berths on Australian ENC’s.										
BOYCAR *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BOYINB *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BOYISD *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BOYLAT *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BOYSAW *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BOYSPP *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
BRIDGE *(A,L,P) (Over navigable water)*	None	None	None	None	None	None	None	None	None	None	None
BRIDGE *(A,L,P) (Over non-navigable water)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	
BUAARE *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	
BUISGL *(A,P) (Conspicuous)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
BUISGL *(A,P) (Non-conspic.)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	
CANALS *(A,L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CAUSWY *(A,L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CBLARE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
CBLOHD *(L) (Over navigable water)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
CBLOHD *(L) (Over non-navigable water)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CBLSUB *(L)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
CGUSTA *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CHKPNT *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
COALNE *(L)*	None	None	None	None	None	None	None	None	None	None	None
CONVYR *(A,L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CONZNE *(A)*	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	NA	NA
	This object class must only be shown on Navigational Purpose 4 and 3 ENC Cells										
COSARE *(A)*	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000
	This object class must only be shown on Navigational Purpose 4, 3, 2 and 1 ENC Cells										
CRANES *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CTNARE *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
CTRPNT *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CTSARE *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
CURENT *(P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
	Where the source indicates a range of current velocity, the attribute CURVEL must be populated with the higher rate, and the attribute INFORM must be populated as *Velocity ranges from [low] to [high] knots*										
CUSZNE *(A)*	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000
	This object class must only be shown on Navigational Purpose 4, 3, 2 and 1 ENC Cells										

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
DAMCON *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
DAYMAR *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the daymark is a slave object, SCAMIN must be the same value as the master object										
DEPARE* *(A)*	None	None	None	None	None	None	None	None	None	None	None
	Where the source indicates the drying height for an intertidal area with no exact position, the attribute INFORM must be populated as *Dries XX.X metres*										
DEPCNT *(L)*	179999	179999	179999	179999	179999	699999	699999	699999	699999	1499999	2999999
	SCAMIN value to be used must be based on dataset Compilation Scale value only, except for supplementary contours (i.e. non-paper chart contours) which must have SCAMIN value based on the Compilation Scale (from **M_CSCL**) of the area covered by the supplementary contours (i.e. one SCAMIN value above the Compilation Scale defined in **M_CSCL**). For broken contours QUAPOS = *3* (inadequately surveyed).										
DISMAR *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
DOCARE *(A)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
DRGARE* *(A)*	None	None	None	None	None	None	None	None	None	None	None
DRYDOC *(A)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
DMPGRD *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
DMPGRD *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
DYKCON *(A,L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
DWRTCL *(L)*	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	2999999	6000000
DWRTPT *(A)*	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000
EXEZNE *(A)*	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000	6000000
	This object class must only be shown on Navigational Purpose 4, 3, 2 and 1 ENC Cells										
FAIRWY *(A)*	349999	349999	349999	349999	349999	349999	349999	699999	1499999	NA	NA
FERYRT *(A,L)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
FLODOC* *(A)*	None	None	None	None	None	None	None	None	None	None	None
FLODOC *(L)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
FNCLNE *(L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
FOGSIG *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the fog signal is a slave object, SCAMIN must be the same value as the master object										

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
FORSTC *(A,L,P) (Conspicuous)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
FORSTC *(A,L,P) (Non-conspic.)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
FRPARE *(A)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
FSHFAC *(A,L,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
FSHGRD *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
FSHZNE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
GATCON *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
GRIDRN *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
HRBARE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
HRBFAC *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
HULKES* *(A)*	None	None	None	None	None	None	None	None	None	None	None
HULKES *(P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
ICEARE *(A)*	None	None	None	None	None	None	None	None	None	None	None
ICNARE *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
ISTZNE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
LAKARE *(A)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
LIGHTS *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the light is a slave object, SCAMIN must be the same value as the master object										
LITFLT *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
LITVES *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
LNDARE* *(A,L,P)*	None	None	None	None	None	None	None	None	None	None	None
LNDELV *(L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
LNDELV *(P) (Conspic/Named)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
LNDELV *(P) (Non-conspic.)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
LNDMRK *(A,L,P) (Conspicuous*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
LNDMRK *(A,L,P) (Non-conspic.)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
LNDRGN *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
LOCMAG *(A,L,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
LOGPON *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
LOKBSN *(A)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
MAGVAR *(A,L,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
	SCAMIN value to be used must be based on dataset Compilation Scale value only										
MARCUL *(A,L,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
MIPARE *(A,P)*	None	None	None	None	None	None	None	None	None	None	None
MORFAC *(A)*	None	None	None	None	None	None	None	None	None	None	None
MORFAC *(L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
NAVLNE *(L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
NEWOBJ *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	The **NEWOBJ** object must only be used to encode Virtual AIS aids to navigation (see SPEC_05_55_AA34159_AUOC – clause 12.14.1.1)										
OBSTRN *(A,L)*	None	None	None	None	None	None	None	None	None	None	None
OBSTRN (P) *(Not adjacent to coastline)*	None	None	None	None	None	None	None	None	None	None	None
	N.B. For groups of **OBSTRN** points in close proximity, the most representative object must have no SCAMIN value, and the remainder must have the following SCAMIN values (based on Compilation Scale value of ENC cell being compiled only):										
	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	For **OBSTRN** points as components of mooring trots, the SCAMIN value should be the same as for the other components of the trot.										
OBSTRN *(P) (Adjacent to coastline or intertidal area)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	As a guide, compilers should interpret “Adjacent to the coastline or intertidal area” on a case by case basis taking into consideration the Navigational Purpose of the cell and the approximation of the obstruction to a navigable channel. Obstruction points falling within 10mm of any coastline or intertidal area boundary at the Compilation Scale of the ENC (CSCL or **M_CSCL** (CSCALE)) should be considered to be “Adjacent”.										

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
OFSPLF *(A,P)*	None	None	None	None	None	None	None	None	None	None	None
	N.B. For groups of **OFSPLF** points in close proximity, the most representative object must have no SCAMIN value, and the remainder must have the following SCAMIN values (based on Compilation Scale value of ENC cell being compiled only):										
	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
OSPARE *(A)*	None	None	None	None	None	None	None	None	None	None	None
OILBAR *(L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
PILBOP *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
PILPNT *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
PIPARE *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
PIPOHD *(L) (Over Navigable water)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
PIPOHD *(L) (Over Non-navigable water)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
PIPSOL *(L,P) (Submarine)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
PIPSOL *(L,P) (On land)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
PONTON* *(A,L)*	None	None	None	None	None	None	None	None	None	None	None
~~***PONTON*** *(P)*~~	~~3999~~	~~7999~~	~~11999~~	~~21999~~	~~44999~~	~~89999~~	~~179999~~	~~349999~~	~~699999~~	~~1499999~~	~~2999999~~
PRCARE *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
PRDARE *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
PYLONS *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
RADLNE *(L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
RADRNG *(A)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
RADRFL *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the radar reflector is a slave object, SCAMIN must be the same value as the master object										
RADSTA *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the radar station is a slave object, SCAMIN must be the same value as the master object										

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
RAILWY *(L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
RAPIDS *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
RCRTCL *(L)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
RCTLPT *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
RDOCAL *(L,P)*	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999
	Call sign to be populated using the attribute INFORM (if known)										
RDOSTA *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the radio station is a slave object, SCAMIN must be the same value as the master object.										
RECTRC *(A,L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
RESARE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
RETRFL *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the retro-reflector is a slave object, SCAMIN must be the same value as the master object										
RIVERS *(A,L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
ROADWY *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	The attribute values CATROD = *5* (major street) and CATROD = *6* (minor street) must not be used unless the road is within a built up area										
RSCSTA *(P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
RTPBCN *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the radar transponder beacon is a slave object, SCAMIN must be the same value as the master object										
RUNWAY *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
SBDARE *(A,L)*	179999	179999	179999	179999	179999	699999	699999	699999	699999	1499999	2999999
	SCAMIN value to be used must be based on Compilation Scale value of ENC cell being compiled only										
SBDARE *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
SEAARE *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
SILTNK *(A,P) (Conspicuous or representative)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
SILTNK *(A,P) (Non-conspic.)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
SISTAT *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the signal station, traffic is a slave object, SCAMIN must be the same value as the master object										
SISTAW *(P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
	If the signal station, warning is a slave object, SCAMIN must be the same value as the master object										
SLCONS *(A,L,P)*	None	None	None	None	None	None	None	None	None	None	None
SLOTOP *(L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
SLOGRD *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
SMCFAC *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
SOUNDG *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	For hairline soundings QUAPOS = *4* (Approximate). As a guide, SCAMIN should be populated such that when a cell is viewed in ECDIS at any of the ENC compilation scales (see paragraph 8(a) above), displayed soundings are about 3-5cm apart. Note, though, that the fundamental principle regarding the population of SCAMIN for any object as described at paragraph 9(b) must be adhered to.										
SNDWAV *(A,L,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
SPLARE *(A,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
SPRING *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
STSLNE *(L)*	699999	699999	699999	699999	699999	699999	699999	699999	699999	NA	NA
	This object class must only be shown on Navigational Purpose 4 and 3 ENC Cells										
SUBTLN *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
SWPARE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
	The attributes POSACC, QUAPOS, SOUACC and TECSOU must be populated if the characteristics of the swept area are not covered by **M_QUAL**										
TESARE *(A)*	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	NA	NA
	This object class must only be shown on Navigational Purpose 4 and 3 ENC Cells										
TIDEWY *(A,L)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
TOPMAR *(P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	If the topmark is a slave object, SCAMIN must be the same value as the master object										
TSELNE *(L)*	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	1499999	NA	NA
TSEZNE *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
TSSBND *(L)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
TSSCRS *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
TSSLPT *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
TSSRON *(A)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
TUNNEL *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
TWRTPT *(A)*	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999	2999999
UNSARE* *(A)*	None	None	None	None	None	None	None	None	None	None	None
UWTROC *(P)* *(Not in OBSTRN area or adjacent to coastline)*	None	None	None	None	None	None	None	None	None	None	None
	N.B. For groups of **UWTROC** in close proximity, the most representative object must have no SCAMIN value, and the remainder must have the following SCAMIN values:										
	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
UWTROC *(P) (In OBSTRN area)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
UWTROC *(P)* *(Adjacent to coastline or intertidal area)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	As a guide, compilers should interpret "Adjacent to the coastline or intertidal area" on a case by case basis taking into consideration the Navigational Purpose of the cell and the approximation of the rock to a navigable channel. Rocks falling within 10mm of any coastline or intertidal area boundary at the compilation scale of the paper chart/plan should be considered to be "Adjacent".										
VEGATN *(A,L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
WATFAL *(L,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
WATTUR *(A,L,P)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
WEDKLP *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
WRECKS *(A,P)* *(Dangerous)*	None	None	None	None	None	None	None	None	None	None	None
	N.B. For groups of **WRECKS** points in close proximity, the most representative object must have no SCAMIN value, and the remainder must have the following SCAMIN values:										
	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
WRECKS *(A,P)* *(Non-dangerous)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
C_AGGR	None	None	None	None	None	None	None	None	None	None	None
C_ASSO	None	None	None	None	None	None	None	None	None	None	None

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.

Smallest scale product an object would appear in	1-3999	4000-7999	8000-11999	12000-21999	22000-44999	45000-89999	90000-179999	180000-349999	350000-699999	700000-1499999	1500000-2999999#
S-57 Object Class	**OBJECT SCAMIN VALUES**										
M_ACCY *(A)*	None	None	None	None	None	None	None	None	None	None	None
M_COVR *(A)*	None	None	None	None	None	None	None	None	None	None	None
M_CSCL *(A)*	None	None	None	None	None	None	None	None	None	None	None
	The attribute CSCALE must be populated as a value from the ENC Compilation Scale list										
M_HOPA *(A)*	None	None	None	None	None	None	None	None	None	None	None
M_NPUB *(A,P)*	None	None	None	None	None	None	None	None	None	None	None
M_NSYS *(A)*	None	None	None	None	None	None	None	None	None	None	None
M_QUAL *(A)*	None	None	None	None	None	None	None	None	None	None	None
M_SDAT *(A)*	None	None	None	None	None	None	None	None	None	None	None
M_SREL *(A,L)*	None	None	None	None	None	None	None	None	None	None	None
M_VDAT *(A)*	None	None	None	None	None	None	None	None	None	None	None
T_HMON *(A,P)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
T_NHMN *(A,P)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
T_TIMS *(A,P)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
TS_FEB *(A,P) (Important)*	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999	6000000
TS_FEB *(A,P) (Less important)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
	Distinction between important and less important must be made by Tides and Geodetic Control Section. Where the source indicated a range in current velocity, the attribute CURVEL must be populated with the higher rate, and the attribute INFORM must be populated as *Velocity ranges from [low] to [high] knots*										
TS_PAD *(A,P)*	3999	7999	11999	21999	44999	89999	179999	349999	699999	1499999	2999999
TS_PNH *(A,P)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
TS_PRH *(A,P)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
TS_TIS *(A,P)*	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

See paragraph 9(d) for SCAMIN values to be used for Navigational Purpose 1 ENC cells.