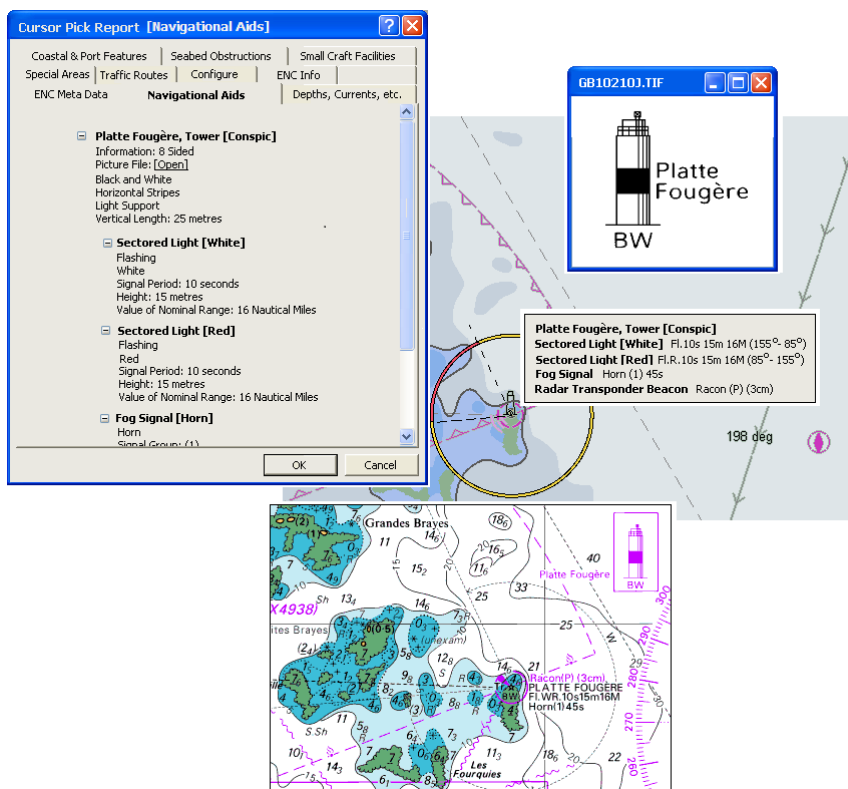


Digital Information and Portrayal Working Group (DIPWG)

IHO S-52 ECDIS Presentation Library

Draft Specifications for Implementing the Cursor Enquiry and Pick Report in ECDIS



Intentionally Blank

Table of Contents

ECDIS CURSOR ENQUIRY AND PICK REPORTING	1
Background	1
Introduction.....	1
Aims and Objectives.....	1
Educating the User (Optional)	1
Note to ENC Data Producers	1
CURSOR ENQUIRY	2
CURSOR ENQUIRY	3
Interpretation and Basic Rules	3
Basic Rules for Presenting and Displaying Cursor Picked Information	3
Information Processing	3
Themes.....	3
Prioritisation of Displayed Information	4
Configuring of the Cursor Pick Report (Directed Cursor Enquiry)	4
Restore Default Option	5
Configured Pick Report Warning	5
Show All Pick Report Option	5
CURSOR PICK REPORTING.....	8
Presentation of Cursor Picked Information (Dialog Box).....	8
Presentation of Information in the Pick Report	8
Initial/Simplified Presentation	8
Initial/Simplified Presentation (Optional Extension)	9
Full Presentation (Expanded View).....	9
Minimising Textual Information in the Cursor Pick Report.....	9
Presentation of all other Attribute Types	9
Presentation of Objects with Question Marks (Optional)	10
Mouse Over or Floating Point Information (Optional)	10
Geographical Co-ordinates (Optional)	11
PRESENTATION OF SPECIFIC FEATURE TYPES	12
Lights and Light Descriptions	12
Sectored Lights.....	12
Relationship Features	12
Presentation of Features with Relationships.....	13
Naming Relationship Features.....	13
Presentation of Master/Slave Relationships	13
Presentation of Master/Slaves from different Themes	13
Presentation of Aggregation & Association Collections	14
Naming Collections	14
Presentation of Multiple Collections Features	14
Information Attribute and Externally Referenced Files [TXTDSC & PICREP].....	15
Presentation of External Text and Picture Files	16
PICREP - Anomalous Workarounds.....	16
Date/Time Dependant Features	17
ECDIS Display of Date/Time Dependant Features	17
Highlighting Date/Time Dependant Features.....	17
Presentation of Attribute Values in the Pick Report.....	17
Optional Extended Functionality	17
Presenting Complex Routeing Measures	18
Inheritance of Common Attributes into Aggregation Objects	19
Tidal Stream Panel Data [TS_PAD]	19
ENC Meta Data	20

New Objects [Optional]	20
Data Quality and Confidence [M_QUAL and CATZOC].....	21
M_QUAL and CATZOC [Optional Extension].....	21
Survey Reliability [M_SREL]	21
Non HO Data Boundary [Optional]	22
Overscale Warnings [Optional]	22
Overscale Boundaries (Optional)	22
Highlighting Features in the Viewer	23
Methods of Highlighting Objects	23
Unsurveyed and Incompletely Surveyed Areas (Optional)	23
Magnetic Variation (Optional)	23
PRESENTATION OF ENC AND ECDIS SPECIFIC INFORMATION	26
Information Relating to a Cursor Picked ENC	26
Mariner Set Parameters (Optional)	26
ENC & Permit Status (Optional)	26
Temporary & Preliminary Notice to Mariners (Optional)	26
ENC Status and Licence Reporting (Optional)	27
ENC Status Reporting	27
Method of Reporting	27
Information about the ECDIS	28
 ANNEX A - THEMED GROUPS OF ENC INFORMATION	 30
ANNEX B – Enumerated and Listed Attribute Assessment	34
ANNEX C - Attribute Assignments & Examples.....	38
ANNEX D – The ECDIS Legend.....	40

ECDIS Cursor Enquiry and Pick Reporting

Background

A paper outlining a proposal for improving & standardising the ECDIS/ECS Pick Report was presented at the joint TSMAD/DIPWG meeting held in Rostock in May 2010. After discussion it was agreed that the current suggested methods of implementing this feature were not adequately specified, a point acknowledged and accepted by those OEMs present. As a result the UKHO with AHO & NOAA were tasked with drafting a minimum standard for Cursor Enquiry and Pick Report for presentation and consideration at the next joint TSMAD/DIPWG meeting in April 2011.

Introduction

During route monitoring the user often needs information quickly. An unprocessed cursor pick, which does not filter, sort, prioritise, or interpret information in the SENC, may result in the user being presented with unnecessary, and sometimes unintelligible, information. The aim of this paper is to look at standardising the presentation of this information to the user that is both intuitive and informative.

The ability to cursor-pick an object, displayed on the ECDIS, for any additional information associated with the symbol is an important part of ECDIS functionality. However this information must be presented to the user in a clear and unambiguous way so that informed decisions can be made in a timely manner by the mariner.

Aims and Objectives

The specifications as defined in the current standards are only suggested methods of implementing Pick Report display in ECDIS. The lack of precise specifications has resulted in a wide variety of different implementations based on different interpretations of the standards. This feature is an important part of the ECDIS functionality and as such should be implemented more uniformly across the different ECDIS equipment. This will make life easier for mariners using multiple ECDIS types on the bridge or moving frequently between vessels with different equipment.

The aim of these *Specifications* is to describe a minimum standard for the look and feel of the ECDIS *Pick Report* and concisely define the presentation of information. The document attempts to cover as many potential improvements as possible. These can always be removed at a later stage if it is considered that the document is over-specified. In this first instance it is presented to provoke comment and debate.

NOTE: The illustrative examples provided in this paper are intended to show how the *Cursor Pick Report* might be implemented in an ECDIS.

Educating the User (Optional)

Many of the symbols presented to the user in an ENC are unfamiliar as these are ECDIS specific. The *Cursor Pick Report* provides the ideal tool with which to educate the user when carrying out *Route Planning* in the ECDIS. For example when the magenta question mark appears next to a symbol a missing attribute warning could be included against the object in the report with further information available on request. There are several further examples of how this information can be presented to the user later in this document. All are flagged as optional as it represents additional work for the OEM.

Note to ENC Data Producers

The implementation of a structured *Cursor Pick Report* by manufactures is dependent on data producers encoding the ENCs as stated in the *S-57 Appendix B1; Annex A (Use of the Object Catalogue for ENC)*.

Intentionally Blank

Cursor Enquiry

Interpretation and Basic Rules

Navigators have been using the paper chart for hundreds of years and are familiar with the symbols, and where appropriate the textual abbreviations associated with them. These symbols and abbreviations have been refined over many years to optimise their appearance on the chart and give a precise description of their meaning in a clear and concise way.

Basic Rules for Presenting and Displaying Cursor Picked Information

Users of ECDIS may have different makes of equipment on the bridge of a vessel or may move periodically between vessels. It is important that all Electronic Chart Display and Information Systems meet a common set of criteria for displaying cursor picked information. The following rules must be applied to all ECDIS.

1	When a cursor enquiry is performed the system must return information on all available feature objects in the SENC regardless of the ECDIS display settings (Base, Standard or All). The only exception being if the user configures the <i>Cursor Pick Report</i> otherwise, in which case a warning must be displayed informing the user of limited reporting.
2	Acronyms, e.g. SLCONS, CATSLC, must not be presented in the <i>Cursor Pick Report</i> . Plain language only must be presented to the user.
3	Category "C" attributes must not be displayed unless requested/forced by the user. Attributes in this subset provide administrative information about an object and the data describing it. In most cases it is of no practical use to the mariner. This information is normally only relevant to S-57 data transferred between Hydrographic Offices.
4	Enumerate or listed attribute number values must not be displayed; only the derived attribute definition (meaning) as defined in the S-57, Appendix A, Chapter 2 (Attributes).
5	There must not be any <u>unnecessary</u> padding of attribute values, e.g. a sounding of 10 metres should not be padded to 10.000000 metres as this could potentially confuse or mislead the user.
6	Coded String (A) type attributes should be presented to the mariner such that they can be easily interpreted, e.g. tide stream panel values populated using the attribute TS_TSP should be presented to the mariner in tabular form similar to that shown on paper charts.
7	Units of measure should be included after all attribute values which are weights or measures, in accordance with the unit of measure quoted in the S-57, Appendix A, Chapter 2 (Attributes).
8	Dates and times should be displayed so as to be easily interpreted by the user, e.g. 20110424T164000 should be converted to "24 April 2011, 04:40pm UTC".
9	Mandatory attribute values for which a value is not known should display this fact, e.g. "No known value".
10	Attributes that are "associated" with other attributes (e.g. NATSUR and NATQUA; LIGHTS attributes) should have the association easily identifiable to the mariner, e.g. by combining the attributes into a single ordered list or table.
11	More?

Information Processing

To enable users to manipulate the configuration of the *Cursor Pick Report* it is necessary to provide a method to sort, filter and prioritise ENC information. The following options are provided to standardise the presentation of the report, provide specific rules for prioritising information and give the user some control over what is presented.

1	Themed groups of similar types of information.
2	Sensible prioritisation of information. When a pick report is selected at a point where a point feature exists, the point feature should appear before area features.
3	Configurable presentation of the <i>Cursor Pick Report</i> so the user can filter out unwanted and/or unnecessary information.
4	Provide additional supporting information in the Cursor Pick Report when an unfamiliar, non standard chart symbol is displayed, e.g. the magenta question mark (This object has a mandatory attribute missing or may not be known).
5	More?

Themes

There may be information that is more relevant to the user depending on the class of the vessel or the leg of a particular voyage. Partitioning of the *Pick Report* would allow the user to quickly target specific information. The

following categories, as defined in S-52, Edition 3.4 (January 2008), Appendix 2, Annex A, Section 13.2, Viewing Groups, could be used to partition information in the *Pick Report*.

	Theme
1	ENC Meta Data [Information about the ENC display]
2	Coastal & Port Features [Land areas, above water dangers, shoreline and major coastal features, conspicuous landmarks, natural features, shoreline structures and port features]
3	Depths, Currents, etc. [Safety contour, depths, currents, tide rips, etc.]
4	Seabed Obstructions [Underwater dangers, seabed dangers, seabed information, rocks, wrecks, obstructions, pipes and cables]
5	Traffic Routes [Routes and tracks]
6	Navigational Aids [Buoys, beacons, topmarks, lights and fog signals]
7	Special Areas [Restricted/cautionary, information/protected and administrative areas]
8	Small Craft Facilities [Services and small craft facilities]

NOTE: It is appreciated that some groups of feature objects fall into different themes, e.g. Landmark objects, with the category Light Support, and Lights. In these instances it will be necessary to create a set of rules which groups them logically in the *Cursor Pick Report*.

Prioritisation of Displayed Information

	Prioritisation Rules
1	Always list object information with <i>Display Base</i> features at the top followed by <i>Standard</i> then <i>Other Information</i> .
2	The default setting for listing <i>Depth Areas</i> , <i>Depths</i> and <i>Depth Contours</i> should always be set to <i>Least Depth</i> first. This can be changed by the user, if necessary, when configuring the <i>Cursor Pick Report</i> .
3	The attributes INFORM, NINFOM, TXTDSC and PICREP should always be displayed in the <i>Cursor Pick Report</i> even when viewing picked feature objects in the initial/simplified view.
4	Feature objects with dubious quality or accuracy attributes should be highlighted in red in the <i>Cursor Pick Report</i> !!!!
5	More?

Configuring of the Cursor Pick Report (Directed Cursor Enquiry)

Functionality should be provided which allows the user to select the contents of the *Cursor Pick Report* and configure it to best meet the user's requirements. This would be especially helpful during route monitoring when time may be critical.

The following list identifies how information may be configured and/or filtered out of the *Cursor Pick Report*:

	Configuration Options
1	Themes: A function that allows the user to select which <i>Theme tabs</i> are displayed in the <i>Cursor Pick Report</i> . These may be based on the class of vessel and the nature of waters for the intended voyage.
2	Feature Types: A function that allows the user to select which geometric primitive type is presented to the user. If the user is only really interested in <i>Navigational Aids</i> it would be sensible to select point features.
3	Set Pick Radius: During route monitoring it might not be possible to target an object in a timely manner due to the <i>Pick Radius</i> set by the system. The user should be able to change the <i>Pick Radius</i> so that a precise <i>Cursor Enquiry</i> is not required. This is especially useful when acquiring point objects such as <i>Lights</i> .
4	Sort Depth Information: The default setting must be " <i>Least Depth First</i> " but the user should have the option to change this to " <i>Greatest Depth First</i> ".
5	View Date Dependant Features: It would be useful for the user if the " <i>View Date Dependant</i>

	<i>Features</i> options were available through the <i>Cursor Pick Report</i> .
6	Display Corrections: It would also be convenient to have the option to " <i>Show Corrections</i> " when reviewing the <i>Cursor Pick Report</i> . It would be useful for the user to be able to toggle this option on/off to check whether there are any new updates along a proposed route.
7	Display Floating Point Information: If implemented it should be possible to switch this feature off, e.g. during route monitoring, as this useful feature could become an annoying under certain operational conditions.
8	Display Non-Navigationally Significant Information: A function that allows the user to display <i>Category C Attributes</i> should be included. Although the default setting must be <i>Off</i> it should be possible for interested parties (HOs) to select these.

The following example illustrates how *Cursor Pick Report – Configure* tab might look:

Restore Default Option

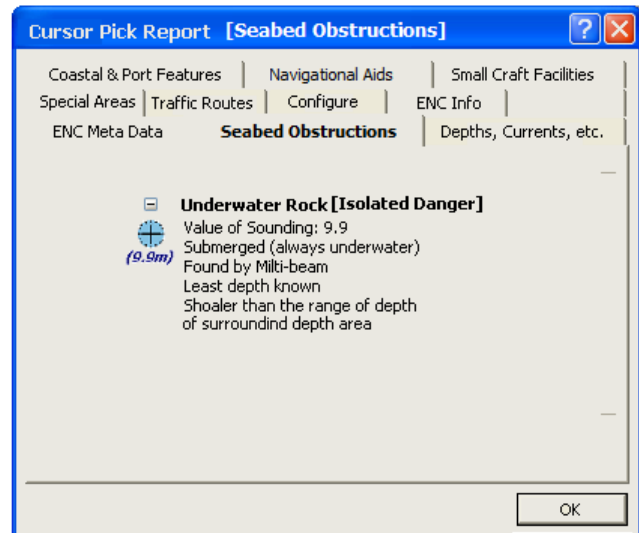
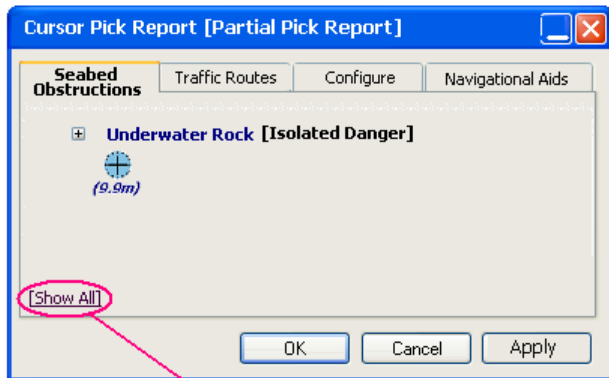
It would be beneficial to define a default set up so that users can always return the *Cursor Pick Report* to a safe configuration in a single operation.

Configured Pick Report Warning

When the *Cursor Pick Report* is customised by the user, using options 1 and 2 above, a warning must be provided to alert the user that only selected types of features have been *Cursor Picked*. This could be displayed in the *Title Bar* of the *Cursor Pick Report* dialog box as illustrated in the screenshot below where *Partial Pick Report* has replaced the *Themed Tab*.

Show All Pick Report Option

If a *Partial Pick Report* is being displayed the system must display an option that allows users to revert to a *Show All* state. The user must also be able to return to full reporting with a single mouse click. This option is not shown when the *Cursor Pick Report* is returned to the default setting.



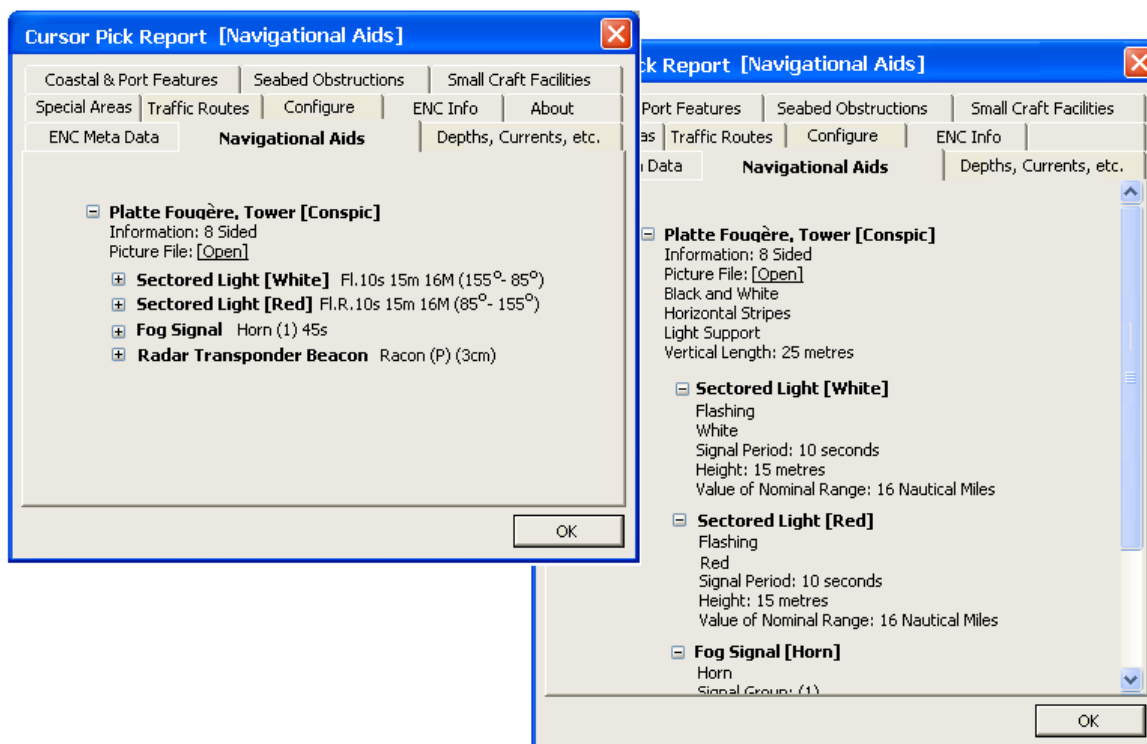
Intentionally Blank

Cursor Pick Reporting

Presentation of Cursor Picked Information (Dialog Box)

Grouping objects into various *themes* enables systems to use a tabbed method of presenting cursor picked information. This way the user can quickly identify and select the tab containing the required object.

Information relating to a cursor picked object should be presented to the user, in the first instance, in a familiar way similar to what he might see on a paper chart. The user should be able to expand a selected object to obtain a full listing of an object's attributes and attribute values. For the purposes of the examples used in this paper it is assumed that the expansion and contraction of the presentation will operate in the same way as used for folders in *Windows Explorer*.



Presentation of Information in the Pick Report

It is important to present cursor picked information in a way that is clear, concise and unambiguous to the user.

Initial/Simplified Presentation

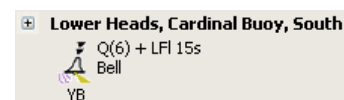
The initial presentation of a *Cursor Picked* object should be in the simplest intelligible format. The following should be displayed as a minimum:

	Presentation Rules	Examples
1	The feature object description, e.g. Coastguard Station	+ Coastguard Station
2	If the object has a qualifying value this should be inserted in brackets, e.g. Depth Area [10 -20 metres]	+ Depth Area [10 - 20 metres]
3	If the object has a "Category of" attribute this should be presented in place of the feature object, e.g. Landmark with Category of Landmark – Tower. Tower should become the object descriptor.	+ Tower
4	Visually conspicuous objects should be annotated in brackets after the object description, e.g. Tower [Conspic]	+ Tower (Conspic)

5	The attributes OBJNAM, INFORM, TXTDSC and PICREP, if available, should be listed under the object description. The object name often gives an indication of the general location of a feature. The information, textual and pictorial attributes often contain important supplementary information which users may overlook if the <i>Cursor Picked</i> object is not expanded.	<div> <div>+</div> <div>Platte Fouquère, Tower [Conspic]</div> <div>Information: 8 Sided</div> <div>Picture File: [Open]</div> </div>
6	If an object is subject to <i>Conditional Symbology Procedures</i> the object description should be displayed with, if applicable, the CSP description in brackets, e.g. Underwater Rock [Isolated Danger].	<div> <div>+</div> <div>Underwater Rock [Depth: 9.9 metres]</div> <div>[Isolated Danger]</div> </div>
7	Relationship objects should be collectively displayed regardless of which <i>Themed</i> group they are in. If the objects contained within a relationship feature are from different <i>Themed</i> groups they should be duplicated in each <i>Themed</i> tab. (To avoid being overlooked by the user). See also section on <i>Relationship Features</i> .	<div> <div>+</div> <div>Platte Fouquère, Tower [Conspic]</div> <div>Information: 8 Sided</div> <div>Picture File: [Open]</div> <div> <div>+</div> <div>Sectored Light [White] Fl.10s 15m 16M (155°- 85°)</div> <div> <div>+</div> <div>Sectored Light [Red] Fl.R.10s 15m 16M (85°- 155°)</div> <div> <div>+</div> <div>Fog Signal Horn (1) 45s</div> <div> <div>+</div> <div>Radar Transponder Beacon Racon (P) (3cm)</div> </div> </div> </div> </div> </div>
8	More?	

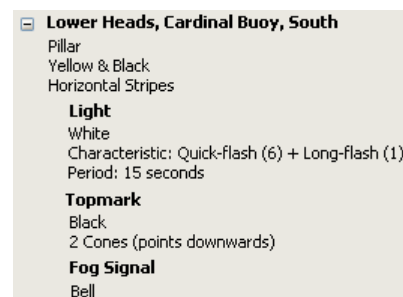
Initial/Simplified Presentation (Optional Extension)

It should be relatively straight forward to present point features symbolised in the *Cursor Pick Report*. Such objects could be configured to look similar to the way they would be depicted on the paper chart. Symbols presented in this way should always be obtained from the *Look-up Table for paper chart point symbolisation* irrespective of the ECDIS display mode.



Full Presentation (Expanded View)

Users may wish to obtain a fuller description of a particular feature, especially during route planning. Therefore it must be possible, with a single click, to obtain a full description of the selected feature's attributes and attribute assignment(s).



Minimising Textual Information in the Cursor Pick Report

To minimise the amount of textual information provided in the *Expanded View* it is not always necessary to reproduce the description of *Enumerated* and *Listed* attributes. In the majority of instances the returned attribute value is self explanatory, e.g. Colour: Red only requires "Red" to be displayed in the *Cursor Pick Report*.

Annex B identifies all *Enumerated* and *Listed* attributes with an assessment¹ of their suitability to be displayed unsupported. The following table provides examples of the five types of *Suitability* assessments. (Comment: more investigation required to collate all attributes with the corresponding objects to assess suitability more objectively)

Attributes	Type	Example(s)	Suitability
Category of Crane	E	Sheerlegs, A-frame	Probably
Category of Dock	E	Tidal, Non-tidal (wet dock)	No
Category of Dumping Ground	L	Explosives dumping ground, Spoil ground	Yes
Category of Fortified Structure	E	Castle, Battery, Redoubt	Possibly
Tint	E	Darkest blue, Medium blue, Lightest blue	N/A

Presentation of all other Attribute Types

It is however necessary to provide the attribute's description in the case of attribute types float (F), integer (I), coded string (A) and free text (S) as the values, in isolation, would be meaningless. If these types of attributes have an associated unit of measurement, qualifier, etc. it must be provided this in the *Cursor Pick Report*, e.g.

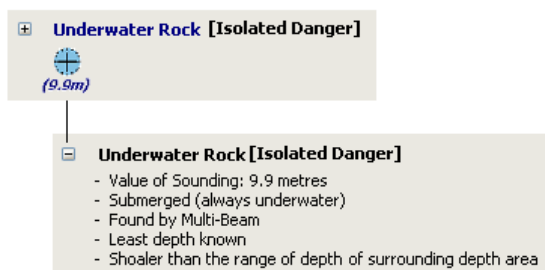
¹ This assessment is a first cut by the author and is included for discussion.

1.6 knots instead of just 1.6. Attribute values containing dates and encoded according to S-57 as YYYYMMDD should be converted to a more familiar format for the user, e.g. 20110424 should be converted to 24 April 2011.

The following table provides examples of the various F, A, I & S attribute types and their expected presentation in the *Cursor Pick Report*.

Attribute	Attribute Type	Encoded Value	Unit, Qualifier, etc	Pick Report Presentation
Buried Depth [BURDEP]	F	2.5	Metres	2.5 metres
Estimated Range of Transmission [ESTRNG]	F	45	Nautical Miles	45 NM or 45 Nautical Miles
Date End [DATEND]	A	20110424	None	24 April 2011
Periodic Date Start [PERSTA]	A	--0501	None	01 May
Communication Channel [COMCHA]	A	07,16	VHF Channel(s)	VHF Channels 7, 16
Signal Frequency [SIGFRQ]	I	2182	Hertz	2182kHz
Multiplicity of Lights [MLTYT]	I	3	None	3
Compilation Scale [CSCALE]	I	75000	None	1:75,000
Information [INFORM]	S	Free Text	None	e.g. See HO Sailing Directions

The example below only provides a description of the attribute *Value of Sounding* as all the others are self explanatory.

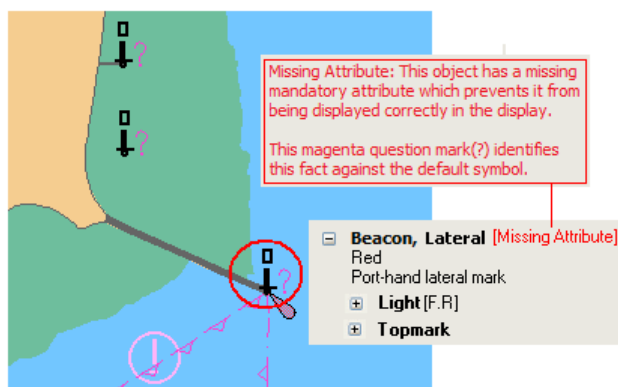


Presentation of Objects with Question Marks (Optional)

The *Cursor Pick Report* could provide a warning when a mandatory attribute is missing. This could be followed by an explanation, on demand, when clicking on the **[Missing Attribute]** text. In the example below the *Beacon Shape* is not encoded.

Mouse Over or Floating Point Information (Optional)

It has been noted by some users that it is not possible to view light descriptions associated with sectored lights. The reason for this is because these are made up of multiple light objects at the same point, one for each sector. If it were



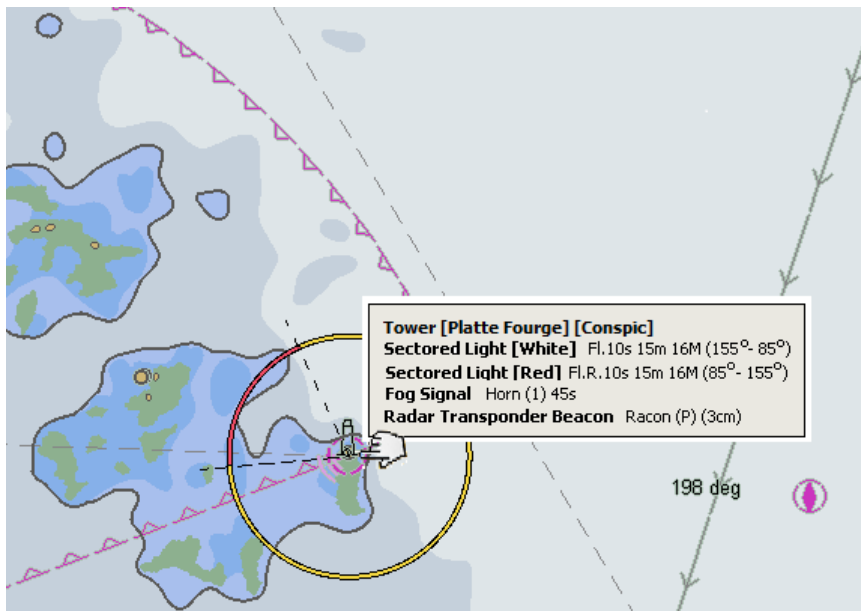
allowable to display the light descriptions these would display over the top of one another rendering them illegible.

A solution to this would be to include a *Mouse Over* feature that displays sectored lights information as the mouse passes over the object. This feature could be extended to all point features and maybe certain area features which are considered appropriate. The example below is an example of how a sectored light could be rendered.

NOTE: The user must be able to disable this function to prevent it interfering with normal ships operations (see the *Configure* section).

Geographical Co-ordinates (Optional)

It may be useful, in the case of point objects, to include the geographical position of the feature in the *Cursor Pick Report*. This may be particularly useful when reporting discrepancies that may be present in the ENC.



Presentation of Specific Feature Types

The following section is intended to provide guidance on how specific feature types might be presented.

Lights and Light Descriptions

In the first instance the object must be annotated with the *Light Attributes* presented in the same order and method as they would be on the paper chart. That is as follows:

1. Light Characteristic
2. Signal Group
3. Colour
4. Signal Period
5. Height
6. Nominal Range

⊕ **Light:** Fl.R. 10s 15m 16M

When listed in expanded display they must be listed in the same order as they would be above.

⊖ **Light:** [Fl.R. 10s 15m 16M]
 Flashing
 Red
 Signal Period: 10 seconds
 Height: 15 metres
 Value of Nominal Range: 16 Nautical Miles

Sectored Lights

Any light object with *Sector Limit* attributes (SECTR1, SECTR2) must be named *Sectored Light* with the *Light Colour* in brackets. This must be followed by the abbreviated light description with the *Sector* in brackets. The expanded view should have the attributes listed in the same order as the paper chart abbreviation with the sector limits at the bottom. In the initial view the inclusion of the sector values would also be useful. This would provide the user with all the required information without having to expand the view.

Sectored lights should be presented in a hierarchal method as described in the section on Master/Slave relationships, e.g. listed under the structure object.

⊕ **Sectored Light [White]** Fl. 10s 15m 16M (155°- 85°)

⊕ **Sectored Light [Red]** Fl.R. 10s 15m 16M (85°- 155°)

⊖ **Sectored Light [White]** [Fl. 10s 15m 16M] [155°- 85°]
 Flashing
 White
 Signal Period: 10 seconds
 Height: 15 metres
 Value of Nominal Range: 16 Nautical Miles
 Sector Limit One: 155 degrees
 Sector Limit Two: 85 degrees

⊖ **Sectored Light [Red]** [Fl.R. 10s 15m 16M] [85°- 155°]
 Flashing
 Red
 Signal Period: 10 seconds
 Height: 15 metres
 Value of Nominal Range: 16 Nautical Miles
 Sector Limit One: 85 degrees
 Sector Limit Two: 155 degrees

Relationship Features

There are several types of relationships in S-57. One of these is where there is a nominated master feature with one or more slaves i.e. master/slave relationship. The other type is where there are two or more objects which make up an aggregation or association i.e. peer to peer relationship.

Presentation of Features with Relationships

If the system detects any of the above relationships all associated feature objects should be listed collectively under either the master feature object or the aggregation/association name².

Naming Relationship Features

If a *Relationship Feature* has an *Object Name* then this must be used to present the feature in the initial view. In the case of *Master/Slave* features this can be followed by the master feature object and, if available, the *Category of Object* as shown in the example. Optionally this can be followed by some text, in brackets, indicating multiple object encoding. If the object has not been named then the feature object is used. In the case of *Associations* and *Aggregations* if these have been encoded with a name this should be used to present these feature type(s). If not then it should be possible to derive the type of the feature from the multiple component objects as shown below.

- + Lower Heads, Cardinal Buoy, South / Cardinal Buoy, South [Multiple Feature]
- + Weymouth Range System / Navigational Lines and Tracks [Multiple Feature]
- + Hastings Recommended Track / Navigational Lines, Tracks and Dangers [Multiple Feature]

Presentation of Master/Slave Relationships

Master/slave relationships are *Navigational Aids* where the master feature is a structure object, e.g. buoy or beacon. The slaves are considered to be equipment objects, e.g. lights, topmarks, etc. When systems detect such features they must be presented in the *Cursor Pick Report* collectively. Initially using the simplified presentation but on demand in a hierarchal structure similar to the example below.

+ Lower Heads, Cardinal Buoy, South
Q(6) + LFI 15s, Bell

OR

+ Lower Heads, Cardinal Buoy, South |
Q(6) + LFI 15s
Bell
YB

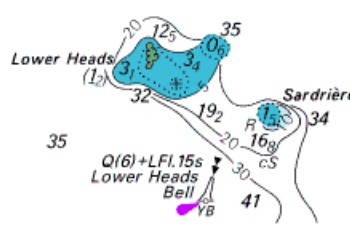
- Lower Heads, Cardinal Buoy, South

Pillar
Yellow & Black
Horizontal Stripes

Light
White
Characteristic: Quick-flash (6) + Long-flash (1)
Period: 15 seconds

Topmark
Black
2 Cones (points downwards)

Fog Signal
Bell



Charted Feature

Presentation of Master/Slaves from different Themes

Some structure objects, e.g. landmark, single building, etc. are not displayed in the same *Themed* tab as navigational aid objects. If any of these objects have the *Function* attribute with an assignment *Light Support* these should be duplicated in the *Navigational Aids* tab. This assumes it has been encoded with a master/slave relationship containing navigational aids.

- Platte Fougère, Tower [Conspic]


Information: 8 Sided
Picture File: [Open]

+ Sector Light [White] Fl. 10s 15m 16M (155°- 85°)

+ Sector Light [Red] Fl. 10s 15m 16M (85°- 155°)

+ Fog Signal Horn (1) 45s

+ Radar Transponder Beacon Racon (P) (3cm)

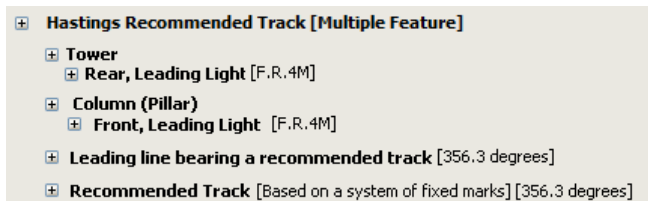


For the purposes of completeness these structure objects must be duplicated in the native tab, i.e. *Coastal & port Features*. This is especially important in the case of conspicuous features where the prominence of the feature is more important to the mariner than the navigational aids it supports.

² It is appreciated that different ENC producers will have their own encoding policy when it comes to these feature types.

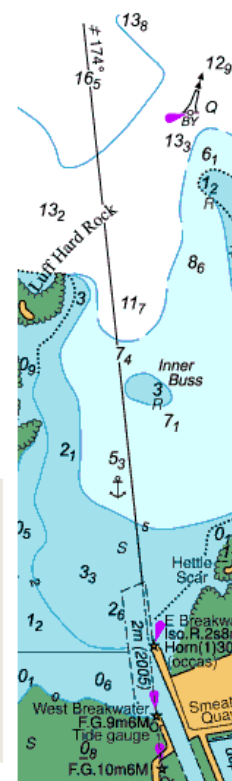
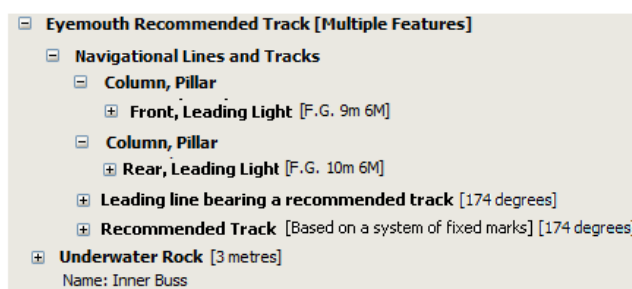
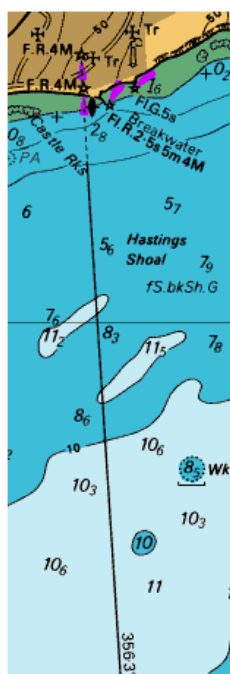
Presentation of Aggregation & Association Collections

An aggregation object [C_AGGR] is used to encode the link between objects that are functionally related and which together form a complex feature. For example, a navigation line, a recommended track and the defining navigational aids should be linked using an aggregation object to form a range system.



An association object [C_ASSC] is used to encode the association between two or more objects. The association does not define a complex feature, merely a link between them. For example, an underwater rock should be associated with the buoy that marks it.

All aggregation and association objects should be presented in a similar way to those identified for master/slave relationships. One fundamental difference is that these feature types can be attributed with *Information Object Name*, *Text* and *Picture files*. If these attributes are encoded these should be displayed in the initial display. Master/Slave relationships within an aggregation must be presented as defined in the previous section.

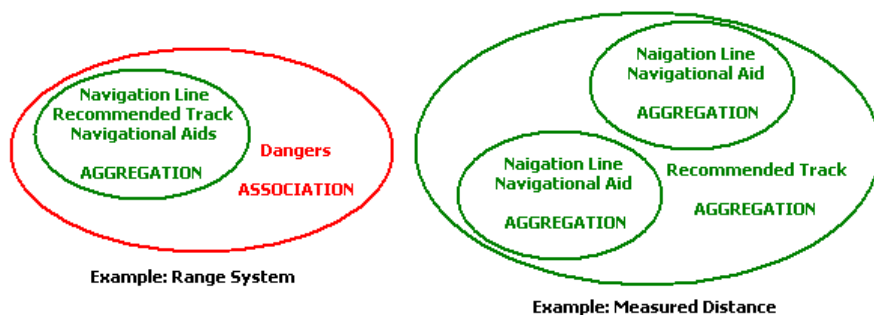


Naming Collections

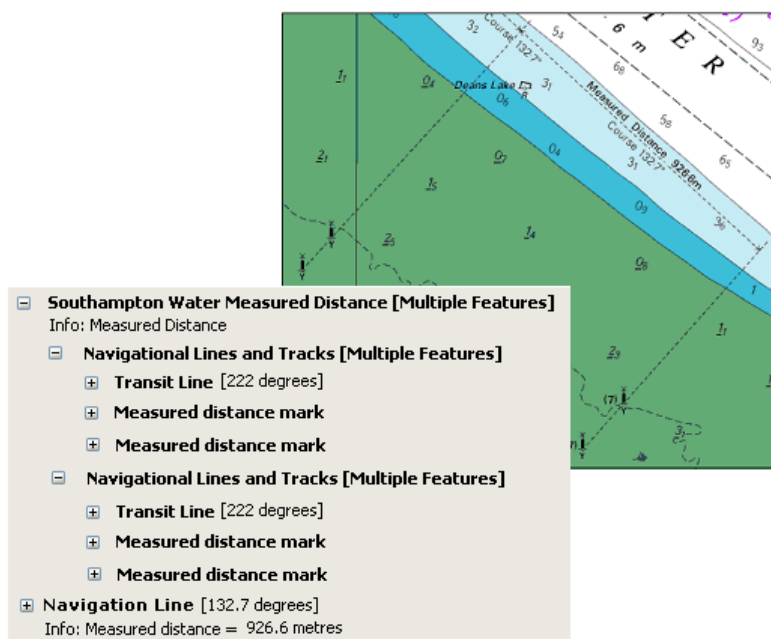
If an aggregation or association is encoded with an *Object Name* this should be used as the top level description of the feature, e.g. *Eyemouth Recommended Track*. Optionally the system can inform the user that this feature is made up of multiple feature objects. In the examples above this is indicated by the bracketed reference to *Multiple Features*.

Presentation of Multiple Collections Features

There may be instances, e.g. range system, where an aggregated feature has associated objects. There are also instances where it is possible to have an aggregation of a set of aggregations as in the encoding of *Measured Distances*.



Multiple collection features should be hierarchical. Taking the examples above the *Association* encompasses both the *Dangers* and the *Aggregation* therefore should be listed first (see example above of the *Weymouth Range System*). Likewise the *Aggregation* that contains the other two is listed first with the secondary aggregations underneath as shown in the illustration below.



It is appreciated that the encoding of these feature types is very much at the discretion of the producer nation. However, encoding these as set out in the *Use of the Object Catalogue* would mean that all relationship features can be presented in a structured way in the *Cursor Pick Report*.

NOTE: Aggregation and association features can carry both the attributes *Textual Information* and *Pictorial Representation*, a fact often overlooked by ENC producers or ignored due to the limitations of some ECDIS. The amount of double encoding could be significantly reduced if these objects were encoded correctly. For example encoders could attribute an aggregation of a TSS with a PICREP even though it is not an allowable attribute of any TSS component. This would remove the requirement for an additional object (M_NPUB) to be created to carry the PICREP.

Information Attribute and Externally Referenced Files [TXTDSC & PICREP]

References to the *Information [INFORM]* attribute and externally referenced files, *Textual [TXTDSC]* and *Pictorial [PICREP]*, must be, when appropriate, listed under the object to which they are attributed. These must be listed even if the object has not been expanded in the *Cursor Pick Report*. These attributes are considered to contain supplementary information which cannot be conveyed in the charted symbol or other attributed information.

Presentation of External Text and Picture Files

It must be possible to call the INFORM attribute as well as Text and Picture files associated with an object with a single operation. The resultant information must be displayed in a separate dialog box and sized no bigger than is necessary to display the content legibly

Nautical Publication Information
 Information: Rise and Fall of the Tide at POOLE (RoRo Terminal)
 Picture: GB0224HA.TIF [\[Open\]](#)

GB0224FA.TIF [Read Only] - Microsoft Office Document I...

GB0224FA.TIF

Submarine Exercise Area
 Name: X5023 Oscar One
 Text File: GB036_08.TXT [\[Open\]](#)

GB036_08.TXT - Notepad

SUBMARINE EXERCISE AREAS

Submarines exercise, both surfaced and dived, within this area. A good lookout is to be kept for them when passing through these waters. See Annual Notice to Mariners Number 8, Practice and Exercise Areas (PEXA) Charts and Admiralty List of Radio Signals.

GB036_08.TXT

PICREP - Anomalous Workarounds

Some feature objects do not have the allowable attribute *Pictorial Representation [PICREP]*, e.g. Any Traffic Separation Scheme (TSS) component. TSS features are often associated with an accompanying diagram, usually when a preliminary notice is issued for these. In these instances data producers are encouraged to create a *Nautical Publication [M_NPUB]* object to carry the picture file³. The *Nautical Publication* object is an *ENC Meta Data* theme and therefore may not be immediately associated with the corresponding feature.

There are instances when an object of this type exists alone, e.g. precautionary area. In these cases encoders have no option but to create a separate *M_NPUB* object to carry the *PICREP* attribute. It should be possible to build a rule into the ECDIS so that if a *M_NPUB* object shares geometry with another object then these objects should be paired in the *Cursor Pick Report* under the relevant tab. In the example below the *M_NPUB* object is paired with the *Precautionary Area* object.

NOTE: Information relating to the *M_NPUB* object should also be included in the *ENC Meta Data* tab so that it is not overlooked by the user when accessing this tab.

Precautionary Area
 Textual Description: GBSOL.TXTPRC.TXT [\[Open\]](#)

PRECAUTIONARY AREA

All vessels over 100 metres in length navigating in this area will be given a MOVING PROHIBITED ZONE of 1000 metres ahead and 100 metres either side. Vessels under 100 metres in length will be prohibited from entering this zone. See Admiralty Sailing Directions for details.

Nautical Publication
 Information: Precautionary Area
 Pictorial Representation: GB0242BA.TIF [\[Open\]](#)

³ Note to encoders: The picture file should be attributed to the aggregation object which contains the TSS components.

Date/Time Dependant Features

Some important features, such as *Traffic Separation Schemes*, may be attributed with a date when they come into force (DATSTA) or are discontinued (DATEND). Such features should only be displayed in the ECDIS viewer during the effective dates. Other objects, such as seasonal buoys, will only be displayed during the effective period (PERSTA to PEREND). There are two sets of temporal attributes as shown in the table below. Any object with one of these attributes should not normally be displayed outside of the effective time/date.

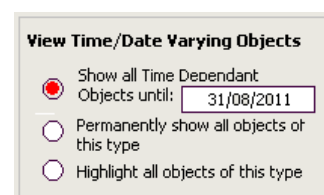
Start	End	Expected Formats	Comment
Date Start [DATSTA]	Date End [DATEND]	YYYYMMDD	Usually associated with <i>Routeing Measures</i>
Period Start [PERSTA]	Period End [PEREND]	YYYYMMDD --MMDD --MM	Usually associated with <i>buoyage</i>

ECDIS Display of Date/Time Dependant Features

To provide for effective route planning, for look-ahead during route monitoring, or for other purposes, the ECDIS must allow the user to view all ENC data, irrespective of any temporal attribution, for the purpose of reviewing pre-planned changes in ENC data. The user should be provided with functionality that allows all objects in the ENC, irrespective of the current date/time, to be displayed.

The following options must be available for selection by the user:

1. Show all date dependant features until a user defined date. This option prevents the unnecessary display of features which do not come into affect until after an intended voyage.
2. Permanently show all features of this type.



Either of these two options can be set using the *Configure* tab in the *Cursor Enquiry Pick Report*.

NOTE: When either of these options is in use, the user must be warned that the information on the display may not be correct for the actual, current, date and time.

Highlighting Date/Time Dependant Features

The ECDIS should provide functionality that allows the user to easily identify objects with temporal attributes. This can either be by highlighting all objects with these attributes or by alternating the display between a before and after status of the ENC.

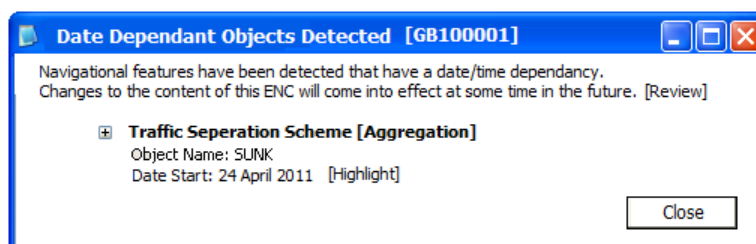
Presentation of Attribute Values in the Pick Report

These attributes have values in a pre-defined format as indicated in the table above. However these should be converted into a more familiar date/time format when displayed in the *Pick Report* as shown in the following example:

20110424T164000 must be converted to 24 April 2011, 04:40pm UTC

Optional Extended Functionality

Additional functionality could be provided that automatically alerts the user to the presence of such objects in the *Cursor Pick Report* or during *Route Planning/Route Checking*. If a *Cursor Enquiry* is performed on an ENC containing these objects it would be useful if a pop up dialog is displayed informing the user. The example below illustrates how this could be implemented.



Alternatively the warning could be provided in the *ENC Info* tab of the *Cursor Pick Report* as follows:

Date/Time dependant object(s) detected
[\[Show\]](#) [\[Highlight\]](#) [\[More Information\]](#)

SHOW
 List all feature collections or objects that have an effective date or time dependency together with the effective date/time.

HIGHLIGHT
 Highlight all objects that have an effective date or time dependency on the display.

MORE INFORMATION
 Date or time dependant feature objects have effective dates or times when they come into force or are discontinued. Under normal ECDIS operation these feature types will only be displayed on screen during the effective date or time. Such features include new or Routeing Measures, seasonal buoyage, etc.

This way the user can easily determine if these navigational features come into effect during the current or intended voyage.

Presenting Complex Routeing Measures

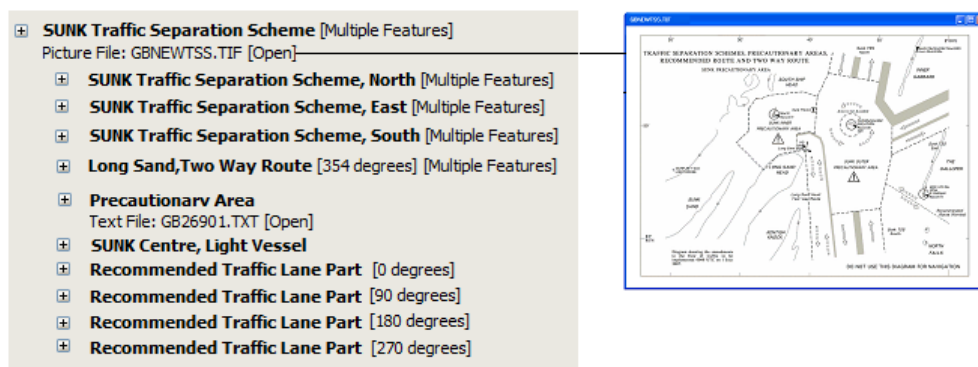
Complex routeing measures, such as a *Traffic Separation Schemes*, can have several component parts (objects) as well as associated supporting *Navigational Aids*. According to the *Use of the Object Catalogue* these should be captured as an aggregation. Such features are very complex and ways should be looked at to simplify the collective display of these in the *Cursor Pick Report*. The presentation of *Navigational Aids* and *Aggregations* has been addressed in previous sections. This section looks at how a complex TSS can be presented comprehensively whilst simplifying the presentation in the *Cursor Pick Report*.

The following table lists all the components associated with a TSS and the corresponding category "A" attributes.

TSS Related Objects	Allowable Attributes (Cat "A")
Traffic Separation Line	CATTSS; DATEND; DATSTA; STATUS
Traffic Separation Zone	CATTSS; DATEND; DATSTA; STATUS
Traffic Separation Scheme Boundary	CATTSS; DATEND; DATSTA; STATUS
Traffic Separation Scheme Crossing	CATTSS; DATEND; DATSTA; STATUS; RESTRN
Traffic Separation Scheme Lane Part	CATTSS; DATEND; DATSTA; STATUS; ORIENT; RESTRN
Traffic Separation Scheme Roundabout	CATTSS; DATEND; DATSTA; STATUS; RESTRN
Inshore Traffic Zone	CATTSS; DATEND; DATSTA; STATUS; RESTRN
Deepwater Route Centreline	CATTRK; DATEND; DATSTA; DRVAL1; DRVAL2; NOBJNM; OBJNAM; ORIENT; QUASOU; SOUACC; STATUS; TECSOU; TRAFIC; VERDAT
Deepwater Route Part	DATEND; DATSTA; DRVAL1; DRVAL2; NOBJNM; OBJNAM; ORIENT; QUASOU; RESTRN; SOUACC; STATUS; TECSOU; TRAFIC; VERDAT
Precautionary Area	DATEND; DATSTA; STATUS; RESTRN

NOTE: All these listed objects share the same common category "B" attributes, i.e. INFORM, NINFOM, NTXTDS, SCAMAX, SCAMIN, and TXTDSC.

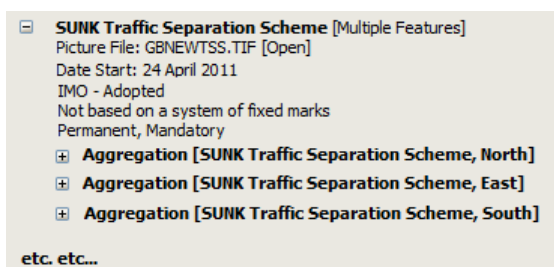
These feature types can sometimes be very complex as the example below shows. This shows an actual TSS that is made up of three *Traffic Separation Schemes* parts plus other components that go to make up the *SUNK Traffic Separation Scheme* off Harwich.



Inheritance of Common Attributes into Aggregation Objects

A method is required for reducing the amount of duplication when displaying these features in the *Cursor Pick Report*. One way would be for the top level aggregation to inherit common attributes with the same attribute assignments. These can then be omitted from the corresponding object in the lower level aggregations. This method can also be applied to standalone aggregations.

In the example below the top level aggregation has inherited the *Date Start*, *Category of Traffic Separation Scheme*, *Category of Recommended Track* and *Status* attributes since these are identical in all the lower level aggregations.

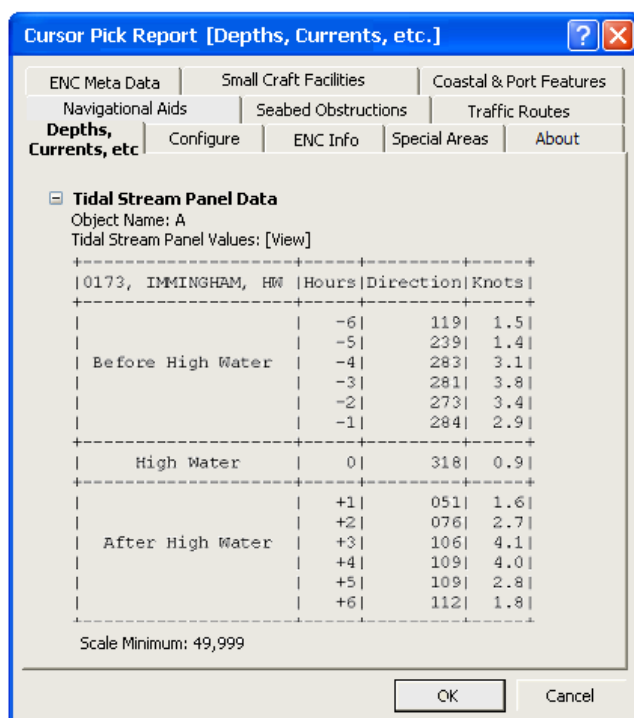


It can be seen from the example below that when the secondary aggregation is expanded only supplementary attribute information is displayed that is unique to that feature object.



Tidal Stream Panel Data [TS_PAD]

Although *Tidal Stream Panel Values* are encoded as a comma separated coded string they must be presented to the user in a tabular form as illustrated below. The information can either be displayed in the *Cursor Pick Report* or in a separate *Text Box* by selecting the "View" button.



Tidal Stream Panel Data
Object Name: A
Tidal Stream Panel Values: [View]

Hours	Direction	Knots
-6	119	1.5
-5	239	1.4
-4	283	3.1
-3	281	3.8
-2	273	3.4
-1	284	2.9
0	318	0.9
+1	051	1.6
+2	076	2.7
+3	106	4.1
+4	109	4.0
+5	109	2.8
+6	112	1.8

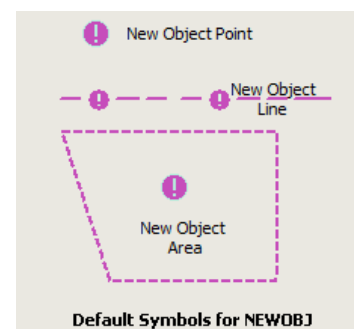
ENC Meta Data

ENC Meta objects are not always understood by ECDIS users. It would be useful if the *Cursor Pick Report* could act as an educational tool as well as a reporting function.

New Objects [Optional]

ECDIS equipment type approved after January 2009 are using version 3.4 of the *IHO ECDIS Presentation Library (January 2008)*. The *New Object* feature object class has been supplemented to the S-57 Object Catalogue 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.

The default symbol at right will be displayed unless the new optional attribute symbol instruction (SYMINS) is used. If this new attribute is populated with a valid symbol name (to be taken from the *IHO ECDIS Presentation Library, Edition 3.4 Addendum*), the specified symbol will be displayed on ECDIS.



New Object [Insert INFORM Text] [More Info]

Class Definition: [Specifies the defining characteristics of the New Object]
Class Name: [Specifies the descriptive name of a New Object feature object class]

[More Info]







From time to time the IMO specify new features which must be included in ENC's for safety related reasons. If these can not be adequately captured using any existing object then the *New Object* feature is used. Further information will be included in the expanded *Cursor Pick Report* view to identify the purpose and nature of the object.

The textual information in the INFORM attribute should be substituted for the object [NEWOBJ]. All other allowable attributes should be displayed in the expanded view with the exception of *Symbol Instruction* which is meaningless to the ECDIS user.


It would be useful if the user could be provided with supplementary information which explains these features.

Data Quality and Confidence [M_QUAL and CATZOC]

Information relating to the quality (M_QUAL) of the bathymetric data contained in an ENC and the corresponding attribution (CATZOC) has been the subject of criticism for many years. The symbology used, apart from cluttering the display, is obscure and not at all intuitive. The attribution reported in the *Pick Report* is even more obscure, e.g. *Category of Zone of Confidence = B*. Therefore from a safety point of view a more consistent and informative method of displaying this information is required for ENCs.

CATZOC	Symbol	Typical Survey Characteristics* and Coverage
A1		Controlled, systematic survey, high position and depth accuracy achieved using DGPS or a minimum three high quality lines of position (LOP) and a multi beam, channel or mechanical sweep system. A full area search undertaken with all significant seafloor features detected and depths measured.
A2		Controlled, systematic survey achieving position and depth accuracy less than A1 using a modern survey echo sounder and a sonar or mechanical sweep system. A full area search undertaken with all significant seafloor features detected and depths measured.
B		Controlled, systematic survey achieving similar depth accuracy but lesser positional accuracy than A2, using a modern survey echo sounder, but no sonar or mechanical sweep system. Full area search not achieved; uncharted features, hazardous to surface navigation are not expected but may exist.
C		Low accuracy survey or data collected on an opportunity basis such as soundings on passage. Full area search not achieved, depth anomalies may be expected.
D		Poor quality data or data that cannot be quality assessed due to lack of information. Full area search not achieved, large depth anomalies may be expected.
U		Source information has not been assessed for quality by the ENC producer

* These descriptions should be seen as indicative examples only.

Quality of Data [Zone of Confidence = B]
 [Click here for more information]

The ENC producer indicates that this area is derived from a controlled, systematic survey achieving a similar depth accuracy to ZOC A2 (next level up) but lesser positional accuracy. The survey was carried out using a modern echo sounder but sonar and mechanical sweep systems were not used.

A full area search was not achieved; uncharted features, hazardous to surface navigation, are not expected but may exist.

Additional information could either be provided in the actual *Cursor Pick Report* or a separate dialog

Quality of Data, Zone of Confidence, Category B

The ENC producer indicates that this area is derived from a controlled, systematic survey achieving a similar depth accuracy to ZOC A2 (next level up) but lesser positional accuracy. The survey was carried out using a modern echo sounder but sonar and mechanical systems were not used.

A full area search was not achieved; uncharted features, hazardous to surface navigation, are not expected but may exist.

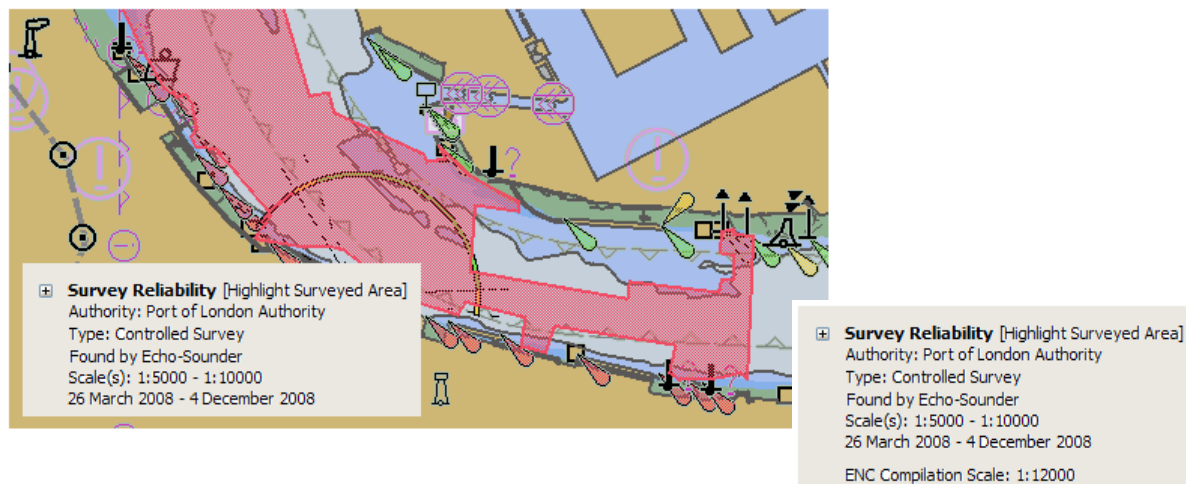
M_QUAL and CATZOC [Optional Extension]

It may be useful to have a *mouse over* function that allows users to have a set radius around the vessel which highlights the appropriate CATZOC values. This could be displayed using a traffic light system to indicate the quality and survey reliability of the data surrounding the cursor or ships own position. [The subject of M_QUAL objects and CATZOC was discussed at the 2nd S-101 Stakeholders Workshop. One proposal was to change the colour of own ships' vector based on the CATZOC value. This was quite well received by the assembled delegates].

Survey Reliability [M_SREL]

Information relating to the reliability of a survey (M_SREL) should be reported to the ECDIS user by the clearest and most concise means. That is with the minimum of text and in a way that is familiar to the user. The example below is intended to try and reproduce the presentation in a similar way to that which might be seen in the *Source Data Diagram* on a paper chart.

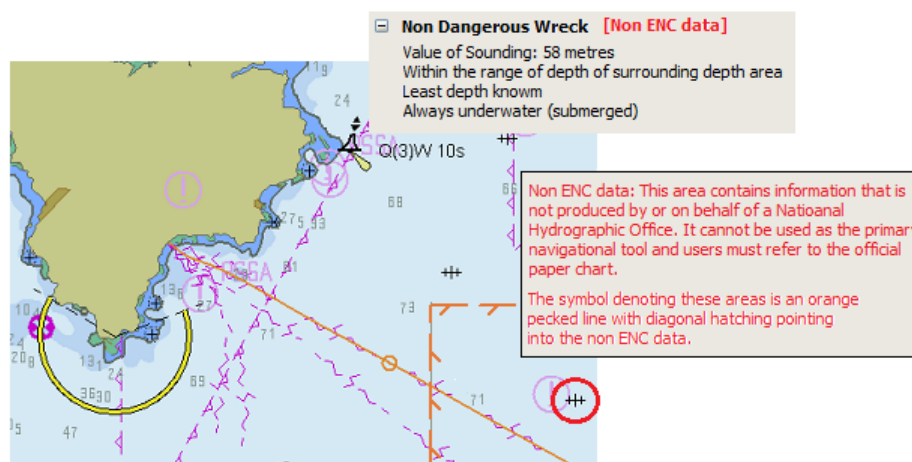
The user must be able to highlight the encoded area with a single mouse click on demand or automatically when the object is selected in the *Cursor Pick Report*.



It may also be useful to the user to include the *ENC Compilation Scale(s)* to assist the user in making any assessment or decision.

Non HO Data Boundary [Optional]

Provide an explanation to the user identifying how the symbol should be used to identify HO and non-HO data. Clicking on **[Non ENC data]** displays an explanation and description of this feature.



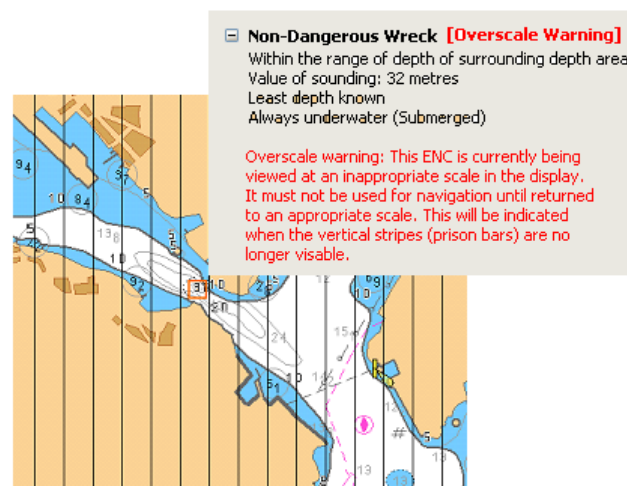
Overscale Warnings [Optional]

Overscale is defined as the display scale of an area which is being viewed grossly enlarged or grossly overscale by a factor of 2 or more with respect to the compilation scale of the data.

Provide a warning and explanation for the user when the *Cursor Enquiry* is made on an ENC that is currently being viewed at overscale.

Overscale Boundaries (Optional)

Provide a definition and an explanation of this symbol.....

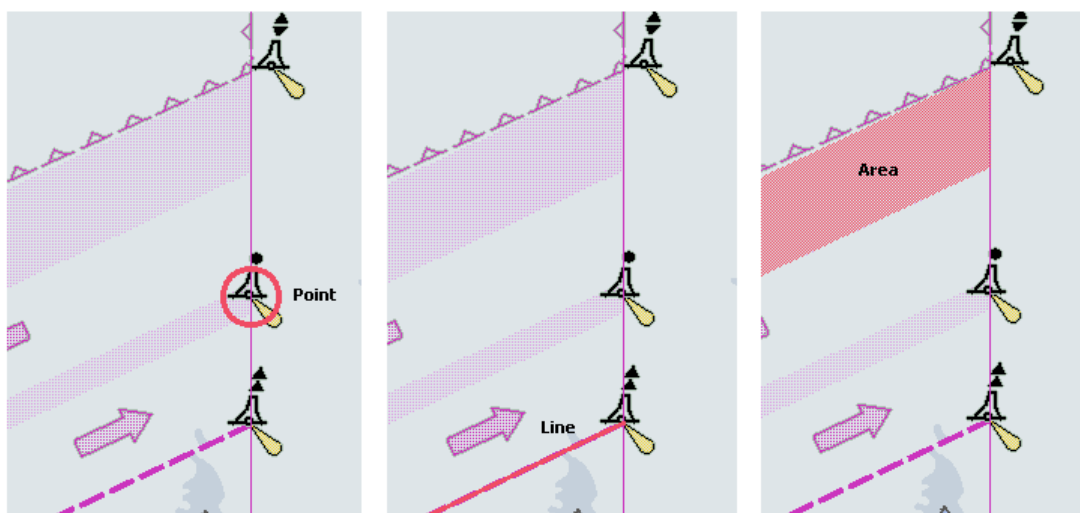


Highlighting Features in the Viewer

To avoid confusion it is important for the user to easily identify and compare a *Cursor Picked Feature* in the ECDIS display against an object listed in the *Cursor Pick Report*. When the user clicks on a listed object the display must highlight the corresponding object in the viewer.

Clicking on an aggregation or association object in the report must highlight all the collective feature objects. Clicking on an individual component must highlight only that feature object.

Methods of Highlighting Objects



There are several types of methods currently being used by OEMs. This paper does not seek to specify which method must be used; this will be very much up to the manufacturer. Three common methods are listed below:

- Overlaying the symbol/line/area with a bold highlighted colour
- Blinking, using changes in brightness
- Flashing on and off at intervals
- Etc. etc...

Unsurveyed and Incompletely Surveyed Areas (Optional)

There is a lot of confusion amongst users as to the meaning of the *Unsurveyed* and *Incompletely Surveyed* area symbols. Also the symbology used to display these feature types are subtly different. The difference is almost imperceptible.



Unsurveyed
[No Depth Areas]



Incompletely Surveyed
[Depth Area]

The difference between the open spacing of the grey dashes of AP(PRTSUR) and the closely spaced dashes of AP(NODATA03) symbolizes the difference between a partly surveyed area with little data and an unsurveyed area with no data at all.

It would be useful for the user if these feature types were reported when the mouse passes over such areas along with a short message of explanation. This assumes the *Mouse Over* function is implemented and enabled.

Magnetic Variation (Optional)

Magnetic Variation values could be presented in the *Cursor Pick Report* in real time or close to it. S-57 allows the *Magnetic Variation* feature to be encoded along with the *Annual Rate of Change* and the *Reference Year*. The following attributes are mandatory for this feature and, if encoded, can be used to calculate the actual Magnetic Variation using the computer clock, GPS, etc.

RYRMGV: Reference year for magnetic variation

VALACM: Value of annual change in magnetic variation

VALMAG: Value of magnetic variation

The rate of change should be added or subtracted from the magnetic variation for each additional year in advance of the reference year. If the rate of change is in the same direction as the magnetic variation then it should be added, if in the opposite direction it should be subtracted.

Examples

Reference year: 2009

Magnetic variation: 007° 30' W

Changing by 04' 00" W annually

Actual Magnetic Variation in 2011 is 007° 38' W

Reference year: 2009

Magnetic variation: 007° 30' E

Changing by 04' 00" W annually

Actual Magnetic Variation in 2011 is 007° 22' W

There is nothing preventing manufacturers from increasing the accuracy of the magnetic variation value with the use of more complex algorithms for calculating the actual value. (Break down the calculation into months, weeks or even days)

Intentionally Blank

Presentation of ENC and ECDIS Specific Information

Information Relating to a Cursor Picked ENC

The system must have a method of reporting information relating to a selected ENC. The following information should be available as a minimum. The *IHO ECDIS Presentation Library, Edition 3.4, January 2008*, Section 8.6.3) identifies a standard legend which should be available for display (See Annex D). This legend is the minimum that should be available, but the complete list need not always be shown. Individual items might be picked by the mariner for display for a period; examples are magnetic variation, data quality for depths (M_QUAL, CATZOC) etc. For the purposes of the *Cursor Pick Report* the following elements should be presented in the display.

1. ENC Cell Name
2. Latest Edition Number
3. Latest Update Number
4. Latest Issue Date (The date the last correction was applied, New ENC, New Edition, Re-issue or update)
5. ENC Compilation Scale
6. Sounding/Vertical Datum
7. Horizontal Datum
8. Units of Depth
9. Units of Height

Mariner Set Parameters (Optional)

Additionally manufacturers may wish to include the *Mariner Set Parameters*. Whether it should be allowable to amend these settings in this tab is open to discussion.

ENC & Permit Status (Optional)

An extension to this option is provided below. This describes a method of displaying the status of the installed ENCs and the validity of the ENC permits.

Temporary & Preliminary Notice to Mariners (Optional)

A common complaint of users of ECDIS is that it is not possible to check for T&P NtoMs in ENCs. Although there are no hard and fast ways of identifying these types of NMs a method could be used to identify some. Many T&P notices have a date dependency as they are in force either for a limited period or at some time in the future. When an ENC containing a date/time dependent object is *Cursor Picked* the report could alert the user. This alert could be presented on the *ENC Info* tab in red similar to the example below.

Date/Time dependant object(s) detected

[Show] [Highlight] [More Information]

SHOW

List all feature collections or objects that have an effective date or time dependency together with the effective date/time.

HIGHLIGHT

Highlight all objects that have an effective date or time dependency on the display.

MORE INFORMATION

Date or time dependant feature objects have effective dates or times when they come into force or are discontinued. Under normal ECDIS operation these feature types will only be displayed on screen during the effective date or time. Such features include new or Routeing Measures, seasonal buoyage, etc.

Additional options could be provided to assist the user including an explanation of these feature types.

ENC Status and Licence Reporting (Optional)

A common observation (complaint) amongst users of ECDIS and others, such as Port State Authorities, is that it is not always easy to quickly check whether an ENC being used for Navigation is up to date. Functionality could easily be provided that would enable ECDIS to report on the status of installed ENCs.

The following specifications can only be applied to systems installing ENCs encrypted according to the IHO S-63 Data Protection Scheme. It is not possible to implement the complete functionality for unencrypted exchange sets as there is insufficient meta data or supporting files to carry out the required checks.

The following table lists files that are included with an encrypted exchange set and the fields which can be used in the reporting function.

FILE	META DATA	PURPOSE
SERIAL.ENC	This file can be read by the system and information relating to the service provider, media type, week and date of issue can be reported.	Check the latest exchange set loaded for a given data provider
PRODUCTS.TXT	This file contains information relating to the status [EDTN, UPDN, ISDT] of each ENC in an integrated ENC Service. The latest file should always be stored on the system and should not be overwritten if an older exchange set is imported. It can also flag whether an ENC in the SENC is cancelled and therefore not subject to updating.	Check the status of installed ENCs.
PERMIT.TXT	This file should be stored and maintained on the system. It contains information relating to the permit expiry date for each ENC and can be used to warn the user whether the permit has expired or is due to expire.	Validate permits for expiry date.

The ECDIS must only store information (PRODUCTS.TXT file⁴ and SERIAL.ENC) relating to the latest media (base or update) imported to the system. This forms the baseline for determining the status of ENCs installed in the SENC. This information must not be overwritten if older media is used to install additional data.

ENC Status Reporting

When a cursor enquiry is made the system should carry out the following checks:

	Checks	Warnings
1	Check the date of the latest installed media against the ECDIS computer clock (or GPS signal) to determine how long it has been since the system was last updated.	If the ECDIS has not been updated within the last 30 days a warning should be displayed informing the user of this fact.
2	Check the edition and update number of the installed ENC against the corresponding record/fields of the stored PRODUCTS.TXT file.	If the installed ENC is not up to date in respect of the installed products listing it must display a warning that this ENC is not up to date. A further message could be displayed informing the user that this ENC must not be used for primary navigation.
3	Check the expiry date of the stored ENC permit file against the computer clock.	If the installed ENC permit has less than 30 days until expiry then a suitable warning should be provided. If the permit has expired then a warning must be given with a further message that updating is not permitted. A text box could also be included that displays the actual expiry date.

Method of Reporting

There are several methods that could be utilised in the *Cursor Pick Report*, a simple text message or the use of a *Traffic Light* display. Because space may be an issue the warnings should be short and to the point as follows:

⁴ Currently a full products listing is supplied with all Base Media from Data Servers supplying services in edition 1.0 of S-63. As Data Servers make the transition to edition 1.1 manufacturers will have to maintain the installed PRODUCTS.TXT file internally as only the update media will contain s full products listing.

1. No updates in last 30 days (ECDIS has had no new updates applied in the last 30 days)
2. ENC is not up to date
3. Permit expires within 30 days
4. Permit expired (updating not permitted)

Additional information can be made available on demand using for instance a *More Info* button. The following illustration shows how a possible *Traffic Light* solution could be implemented.

Cursor Pick Report

ENC Meta Data | Small Craft Facilities | Coastal & Port Features
 Navigational Aids | Seabed Obstructions | Depths, Currents, etc.
ENC Info | Configure | Traffic Routes | Special Areas | Help/About

ENC Cell Name: GB100001
 ENC Edition Number: 8
 ENC Update Number: 12
 Latest Issue Date: (date of last correction) 25/12/2010
 ENC Compilation Scale: 100,000

Sounding/Vertical Datum: Lowest Astronomical Tide
 Horizontal Datum: WGS 84
 Units of Depth: Metres
 Units of Height: Metres

Date/Time dependant object(s) detected
[\[Show\]](#) [\[Highlight\]](#) [\[More Information\]](#)

Mariner Set Parameters
 Safety Depth: 8m
 Safety Contour: 10m
 Safety Height: 31m
 Shallow Contour: 5m
 Deep Contour: 20m

Latest Media Applied
 GB, Update, WK03/11, 17/01/11

ENC Status
 ● ENC is Up-to-Date
 ○ 30 days since new media applied
 ● ENC is not Up-to-Date - Updates are missing or have failed import

Licence Status
 ● ENC Cell Permit is valid
 ○ ENC Cell Permit expires in less than 30 days
 ● ENC Cell Permit has expired - Updating is not permitted

OK Cancel

Information about the ECDIS

The *Cursor Pick Report* should be able to display information about the ECDIS. This information is useful when determining the status of a particular ECDIS especially as there are now many editions of the various IHO standards. These standards are being constantly improved and updated in response to changes in requirements.

The illustration across shows the information in an *About* tab and provides an indication of what could be included.

Cursor Pick Report

ENC Meta Data | Small Craft Facilities | Coastal & Port Features
 Navigational Aids | Seabed Obstructions | Depths, Currents, etc.
About | Configure | Traffic Routes | Special Areas | ENC Info

ECDIS Version & Build
 Version 3.1.1
 Build 239

Compliant with IHO Standards
 S-57, Edition 3.1, dated June 2009
 S-52, Appendix 2, Edition 4.3, dated January 2008
 S-52, Presentation Library, Edition 3.4, dated January 2008
 S-63, Edition 1.1, dated March 2008

ECDIS Type Approval Information
 Certification Authority:
 Date Certified:
 Tested against, etc, etc.....

ECDIS S-63 Userpermit
 A52EAC2FC6B3D0E6036F6F583130

OK

Intentionally Blank

ANNEX A - THEMED GROUPS OF ENC INFORMATION

ENC META DATA [INFORMATION ABOUT THE CHART DISPLAY]		
Base Display	Standard Display	Other Information
<ol style="list-style-type: none"> 1. Cursor [symbol SY(CURSRA01)] 2. Scale bar, latitude scale [SY(SCALEB10),SY(SCALEB11)] 3. North arrow [SY(NORTHAR1)] 4. No data [colour NODTA, AP(NODATA03)], Unsurveyed (UNSARE), incompletely surveyed area 5. Non-HO data boundary LC(NONHODAT) 	<ol style="list-style-type: none"> 1 Unknown object (magenta question mark) 2 Generic Object (NEWOBJ01) 3 Chart scale boundary, overscale data [AP(OVERSCO1)] 4 Place-holder for geographic names (LNDGRN, SEAARE) 	<ol style="list-style-type: none"> 1 Accuracy of data (M_ACCY) 2 Survey reliability (M_SREL) 3 Quality of data (M_QUAL) 4 Symbol LOWACC01, identifying low accuracy data, applied to the spatial object of point and area wrecks, rocks and obstructions and to point land areas 5 Nautical publication (M_NPUB) 6 Information from attributes INFORM, TXTDSC, PICREP 7 Data scale and coverage (M_CSCL, M_COVR) 8 Magnetic variation (MAGVAR) 9 Local magnetic anomaly (LOCMAG)

NATURAL, MAN MADE & PORT FEATURES [Coastal & Port Features]		
Base Display	Standard Display	Other Information
<ol style="list-style-type: none"> 1. Land area (LANDARE). 2. Bridge (BRIDGE), Pylon (PYLONS), Overhead cable (CBLOHD), Conveyor (CONVYR), Overhead pipeline (PIPOHD), offshore platform (OFSPLF). 3. Coastline (COALNE), Ice shelf, glacier (ICEARE), Shoreline construction (SLCONS), Tie-up wall, dolphin (MORFAC), Gate (GATCON), Pile (PILPNT), Crib, wellhead, ice boom (OBSTRN), Floating dock (FLODOC), Hulk (HULKES), Pontoon (PONTON), Oil boom (OILBAR), Log boom (LOGPON), Flood barrage (DAMCON, CATDAM3) 4. Dock (DOCARE), Lock (LOKBSN), Canal (CANALS), River (RIVERS). 	<ol style="list-style-type: none"> 1. Lake (LAKARE), Sloping ground (SLOGRD), Slope top (SLOTOP), Dyke (DYKCON), Causeway (CAUSWY), Dam (DAMCON) 2. Radar conspicuous object (any object with attribute CONRAD 1) 3. Visually conspicuous object (any object with attribute CONVIS 1) 4. Built up area (BUAARE) 	<ol style="list-style-type: none"> 1. Dunes, hills (SLOGRD), Ridge, cliff top (SLOTOP), Contours and elevation (LNDELV) 2. Trees, vegetation, mangrove (VEGATN), marsh (LNDGRN) 3. River (RIVERS), Lake (LAKARE), Rapids (RAPIDS), Waterfall (WATFAL) 4. Tideway (TIDWAY), Saltpan (SLTPAN) 5. Landmark (LNDMRK), Building (BUIISGL), Tank, silo, water tower (SILTNN), Cairn (CAIRNS), Wall (FNCLNE), Fort (FORSTC) of which none are classified as CONVIS1 (conspicuous) 6. Airport (AIRARE), Runway (RUNWAY) 7. Railway (RAILWY), Road (ROADWY), Tunnel (TUNNEL), Control point (CTRPNT) 8. Quarry, refinery, power station, tank farm, wind farm, factory, timber yard (PRDARE) 9. Harbour type (HRBFAC), Customs check point

		(CHKPNT) 10. Distance mark (DISMAR) 11. Berth number (BERTHS), Mooring facility (such as bollard) (MORFAC), Gate (such as lock gate) (GATCON), Dry dock (DRYDOC), Crane (CRANES) 12. Gridiron (GRIDRN)
--	--	---

DEPTHS, CURRENTS ETC

Base Display	Standard Display	Other Information
1. Safety contour (from conditional symbology procedure DEPCNT03), Depth area (DEPARE) 2. Dredged area (DRGARE)	1. Area of depth less than the safety contour (DIAMON01 pattern) 2. Swept area (SWPARE)	1. Soundings (SOUNDG) 2. Depth contours (DEPCNT) other than the safety contour, Line depth area (DEPARE) 3. Label for the safety contour 4. Label for contours other than the safety contour 5. Water turbulence (WATTUR) 6. Tidal information (T_HMON, T_NHM, T_TIMS) 7. Current and tidal stream information (CURRENT, TS_FEB, TS_PAD, TS_PNH, TS_PRH, TS_TIS)

SEABED, OBSTRUCTIONS, PIPELINES

Base Display	Standard Display	Other Information
1. Isolated underwater dangers in water deeper than the displayed safety contour (rocks, wrecks, obstructions, mooring cables from conditional symbology procedure)	1. Mooring cables (MORFAC, CATMOR 6), (CBLSUB, CATCBL 6), Tunnel on Seabed (TUNNEL, BURDEP=0), Sand waves (SNDWAV)	1. Nature of seabed (SBDARE) 2. Spring (SPRING), sea weed (WEDKLP) 3. Fish haven (FSHHAV), Fishing stakes, etc. (FSHFAC) 4. Rocks (UWTROC), Wrecks (WRECKS), Obstructions (OBSTRN), which are not a danger to own ship's navigation 5. Non-dangerous rocks (UWTROC), Wrecks (WRECKS) and Obstructions (OBSTRN) which have a VALSOU attribute and are <u>not</u> a danger to own-ship's navigation 6. Submarine cable (CBLSUB), Submarine pipeline (PIPSOL)

TRAFFIC ROUTES

Base Display	Standard Display	Other Information
	1. Leading line, clearing line (NAVLNE), Traffic lane (TSSLPT), Deep water route (DWRTPPT), Traffic	

	separation area (TSEZNE), Traffic separation line (TSELNE), Traffic roundabout (TSSRON), Traffic crossing (TSSCRS), Precautionary area (PRCARE), Traffic separation scheme boundary (TSSBND), Deep water route centre line (DWRTCL), Two way route part (TWRTPT), Inshore traffic zone (ISTZNE) 2. Recommended track (RECTRC), Recommended traffic lane (RCTLPT), Recommended route centreline (RCRTCL) 3. Ferry route (FERYRT) 4. Radar line (RADLNE), Limit of shore radar (RADRNG) 5. Radio calling in point (RDOCAL)	
--	---	--

SPECIAL AREAS		
Base Display	Standard Display	Other Information
	1. Restricted area (RESARE) 2. Ferry route area (FERYRT), Submarine transit lane (SUBTLN), Military practice area (MIPARE), Sea plane landing area (SPLARE), Offshore production area (OSPARE) 3. Caution area (CTNARE), fairway (FAIRWY) 4. Fishing ground (FSHGRD), marine farm (MARCUL) 5. Anchorage area (ACHARE), anchor berth (ACHBRT) 6. Pipeline area (PIPARE), cable area (CBLARE) 7. Dumping ground (DMPGRD) 8. Cargo transshipment (CTSARE), incineration (ICNARE) 9. Archipelagic sea lane (ASLXIS, ARCSLN)	1. Continental shelf (COSARE) 2. Harbour area (HRBARE), Free port area (FRPARE), customs zone (CUSZNE) 3. Fishery zone (FSHZNE) 4. Contiguous zone (CONZNE), Exclusive economic zone (EXEZNE), Territorial sea (TESARE), Territorial sea baseline (STSLNE), Administration area (ADMARE)

NAVIGATIONAL AIDS		
Base Display	Standard Display	Other Information
	1. Buoy (BOYxxx), Light float (LITFLT), Mooring buoy (MORFAC, CATMOR7), Light vessel (LITVES) 2. Beacon (BCNxxx) 3. Daymark (DAYMAR) 4. Direction of buoyage IALA buoyage regions (M_NSYS) 5. Topmarks (TOPMAR) 6. Light (LIGHTS), 7. Fog signal (FOGSIG), Retro-reflector (RETRFL) 8. Racon (RTPBCN) 9. Radar reflector (RADRFL)	

SERVICES & SMALL CRAFT FACILITIES		
Base Display	Standard Display	Other Information
	<ol style="list-style-type: none">1. Pilot boarding point (PILBOP)2. Signal station, traffic (SISTAT), Sig. stn. warning (SISTAW)	<ol style="list-style-type: none">1. Radar station (RADSTA), Radio station (RDOSTA)2. Coastguard station (CGUSTA), Rescue station (RSCSTA)3. Small craft facilities (SMCFAC)

ANNEX B – Enumerated and Listed Attribute Assessment

Attribute	Type	Example(s)	Suitability
Beacon shape	E	Stake, pole, perch, post, Withy, Cairn, Buoyant beacon....	Yes
Building shape	E	High-rise building, Pyramid, Cylindrical, Cubic.....	Probably
Buoy shape	E	Conical (nun, ogival), Can (cylindrical), Ice buoy	Yes
Colour	L	White, Black, Red, Green, Blue, Yellow	Yes
Colour pattern	L	Horizontal stripes, Vertical stripes, Border stripe	Yes
Condition	E	Under construction, Ruined, Under reclamation, Wingless	Yes
Conspicuous, Radar	E	Radar conspicuous, Not radar conspicuous, Radar conspicuous (has radar reflector)	Yes
Conspicuous, Visually	E	Visually conspicuous, Not visually conspicuous	Yes
Exhibition condition of light	E	Light shown without change of character, Daytime light, Fog light, Night light	Yes
Exposition of sounding	E	Within the range of depth of the surrounding depth area, Shoaler than the range of depth of the surrounding depth area, Deeper than the range of depth of the surrounding depth area	Yes
Function	L	Harbour-master's office, Custom office, Hospital, Hotel	Yes
Horizontal datum	E	WGS 72, WGS 84, European 1950, North American 1983	Yes
Jurisdiction	E	International, National, National sub-division	No
Light characteristic	E	Fixed, Quick-flashing, Isophased, Occulting, Morse	Yes
Light visibility	L	High intensity, Low intensity, Faint, Partially obscured	Yes
Marks navigational, system	E	IALA A, IALA B, No system, Other system	Probably
Nature of construction	L	Masonry, Concreted, Wooden, Metal, Painted	Yes
Nature of surface	L	Mud, Silt, Sand, Stone, Gravel, Pebbles	Yes
Nature of surface - qualifying terms	L	Fine, Medium, Coarse, Broken	Yes
Product	L	Oil, Gas, Water, Stone, Coal, Ore, Chemicals	Yes
Quality of position	E	Surveyed, Unsurveyed, Inadequately surveyed, Approximate, Position doubtful	Yes
Quality of sounding measurement	L	Depth known, Depth unknown, Doubtful sounding, Unreliable sounding	Yes
Restriction	L	Anchoring prohibited, Anchoring restricted, Fishing restricted, Trawling prohibited, Dredging prohibited	Yes
Signal generation	E	Automatically, By wave action, By hand, By wind	No
Status	L	Permanent, Occasional, Recommended, Not in use	Yes
Survey Type	L	Reconnaissance/sketch survey, Controlled survey	Yes
Technique of sounding measurement	L	Found by echo-sounder, Found by side scan sonar, Found by diver, Found by lead-line	Yes
Tide - accuracy of water level	E	Better than 0.1 m and 10 minutes, Worse than 0.1 m or 10 minutes	Yes
Tide - method of tidal prediction	E	Simplified harmonic method of tidal prediction, Full harmonic method of tidal prediction, Time and height difference non-harmonic method	Yes
Topmark/daymark shape	E	Cone, point up, Sphere, X-shape (St. Andrew=s cross)	Yes
Traffic Flow	E	Inbound, Outbound, One-way, Two-way	Yes
Vertical Datum	E	Mean low water springs, Mean sea level, Indian spring low water, Approximate lowest astronomical tide	Yes
Water level effect	E	Partly submerged at high water, Always under water/submerged, Covers and uncovers, Floating	Yes

Attribute, Category of	Type	Example(s)	Suitability
Airport/airfield	L	Civil aeroplane airport	Yes
Anchorage	L	Deep water anchorage	Yes
Bridge	L	Swing bridge, Viaduct	Yes
Built-up area	L	City, Holiday village	Yes
Cable	E	Telephone, Telegraph	No

Canal	E	Transportation, Drainage	No
Cardinal mark	E	North cardinal mark	Yes
Checkpoint	E	Custom	No
Coastline	E	Steep coast, Mangrove	Yes
Control point	E	Horizontal control – main station	Yes
Conveyor	E	Aerial cableway (telepheric)	Yes
Coverage	E	No coverage available	Yes
Crane	E	Sheerlegs, A-frame	Probably
Dam	E	Weir, Dam, Flood barrage	Yes
Distance mark	E	Visible mark (pole)	No
Dock	E	Tidal, Non-tidal (wet dock)	No
Dumping ground	L	Explosives dumping ground, Spoil ground	Yes
Fenceline	E	Fence, Hedge, Wall	Yes
Ferry	E	Cable ferry, Free moving ferry, ice ferry	Yes
Fishing facility	E	Fishing stake, Tunny net	Yes
Fog signal	E	Explosive, Diaphone, Bell	Possibly
Fortified structure	E	Castle, Battery, Redoubt	Possibly
Gate	E	Caisson, Sluice, Lock gate	Yes
Harbour facility	L	Ferry terminal, Naval base, Syncrolift, Straddle carrier	Possibly
Hulk	L	Floating restaurant, Museum, Accommodation	No
Ice	E	Fast ice, Glacier, Polar Ice	Yes
Installation buoy	E	Catenary anchor leg mooring (CALM), Single buoy mooring (SBM or SPM)	Yes
Land region	L	Fen, Marsh, Lava flow, Moraine	Possibly
Landmark	L	Cairn, Cemetery, Windsock, Tower, Windmill	Yes
Lateral mark	E	Port-hand lateral mark	Yes
Light	L	Directional function, Front, Rear, Upper, Lower	No
Marine farm/culture	E	Crustaceans, Oysters/mussels, Fish	No
Military practice area	L	Submarine exercise area, Firing danger area	Yes
Mooring/warping facility	E	Dolphin, Bollard, Tie-up wall, Mooring Buoy	Probably
Navigation line	E	Clearing line, Transit line, Leading line bearing a recommended track	Yes
Obstruction	E	Snag/stump, Crib, Foul ground, Foul area, Boom	No
Offshore platform	L	Production platform, Single anchor leg mooring (SALM), Navigation, communication and control buoy	No
Oil barrier	E	Oil retention (high pressure pipe), Floating oil barrier	Yes
Pile	E	Stake, Post, Tripodal	No
Pilot boarding place	E	Boarding by pilot-cruising vessel, Boarding by helicopter, Pilot comes out from shore	No
Pipeline/pipe	L	Outfall pipe, Intake pipe, Sewer, Bubbler system, Supply pipe	Yes
Production area	E	Quarry, Mine, Stockpile, Power station area	Probably
Pylon	E	Power transmission pylon/pole, Telephone/telegraph pylon/pole, Aerial cableway/sky pylon, Bridge pylon/tower, Bridge pier	Yes
Quality of data	E	Data quality A	No
Radar station	E	Radar surveillance station, Coast radar station	Yes
Radar transponder beacon	E	Ramark, radar beacon transmitting continuously, Racon, radar transponder beacon, Leading racon/radar transponder beacon	Yes
Radio station	L	Circular (non-directional) marine or aero-marine radiobeacon, Omega, Syledis, Chaika (Chayka)	Possibly
Recommended track	E	Based on a system of fixed marks, Not based on a system of fixed marks	No
Rescue station	L	Rescue station with lifeboat, Refuge for shipwrecked mariners, Aid radio station, First aid equipment	Yes
Restricted area	L	Offshore safety zone, Seal sanctuary, Minefield, Waiting area	No
Road	E	Motorway, Minor road, Track/path, Crossing	Yes
Runway	E	Aeroplane runway, Helicopter landing pad	Yes
Sea area	E	Gat, Bank, Deep, Bay, Trench, Basin, Mud flats	No
Shoreline construction	E	Breakwater, Groyne, Mole, Pier (jetty)	Yes
Signal station, traffic	L	International Port Traffic, Berthing, Dock, Flood barrage	No
Signal station, warning	L	Danger, Maritime obstruction, Cable, Military practice	No

Silo/tank	E	Silo (in general), Tank (in general), Grain elevator, Water tower	Yes
Slope	E	Cutting, Embankment, Dune, Hill, Pingo, Cliff, Scree	Yes
Small craft facility	L	Fuel station, Electricity, Bottle gas, Showers, Launderette	Probably
Special purpose mark	L	Target mark, ODAS, LANBY, TSS mark, Refuge beacon	Yes
Tidal Stream	E	Flood stream, Ebb stream, Other tidal flow	Yes
Traffic Separation Scheme	E	IMO – adopted, Not IMO - adopted	Yes
Vegetation	L	Grass, Bush, Deciduous wood, Wood in general, Mangroves	Yes
Water turbulence	E	Breakers, Eddies, Overfalls, Tide rips, Bombora	Yes
Weed/kelp	E	Kelp, Sea weed, Sea grass, Saragasso	Yes
Wreck	E	Non-dangerous wreck, Dangerous wreck, Distributed remains of wreck, Wreck showing mast/masts, Wreck showing any portion of hull or superstructure	Yes
Zone of confidence	E	Zone of confidence A1	No

Intentionally Blank

ANNEX C - Attribute Assignments & Examples

- Enumerated ("E"):** The expected input is a number selected from a list of pre-defined attribute values. Exactly one value must be chosen. The abbreviation for this type is "E".
- Example: Beacon Shape, E=1 : stake, pole, perch, post
- List ("L"):** The expected input is a list of one or more numbers selected from a list of pre-defined attribute values. Where more than one value is used, they must normally be separated by commas but in special cases slashes ("/") may be used. The abbreviation for this type is "L".
- Note: In some cases, dependency exists between different attributes of a given object e.g. a bridge (BRIDGE) may have the values "concreted" and "iron/steel" for the attribute NATCON (Nature of Construction) and the values "red" and "green" for the attribute COLOUR. Even if it is known that the concreted part of the bridge is red and the iron/steel part is green, the Object Catalogue provides no means of indicating this relationship. However, such relationships may be formalized for a given application in which case the relationship must be described in the appropriate Product Specification (see S-57 Appendix B).
- Example: Category of Anchorage: L=1 : unrestricted anchorage
- Float ("F"):** The expected input is a floating point numeric value with defined range, resolution, units and format. The abbreviation for this type is "F".
- Example: Current Velocity, encoded as 1.6 but since the expected unit is in knots this should be added to the end of the encoded string.
- Integer ("I"):** The expected input is an integer numeric value with defined range, units and format. The abbreviation for this type is "I".
- Example: Compilation Scale, 1:50,000 is encoded as 50000.
- Coded string ("A"):** The expected input is a string of ASCII characters in a predefined format. The information is encoded according to defined coding systems e.g.: the nationality will be encoded by a two character field specified by ISO 3166 "Codes for the Representation of Names of Countries", e.g. Canada "CA" (refer to S-57 Appendix A Annex A). The abbreviation for this type is "A".
- Example: Date End, expected input is YYYYMMDD, should be presented as 24 April 2011
Communication Channel(s) [XXXX],[XXXX], VHF-Channel(s) 07 & 16
- Free text ("S"):** The expected input is a free-format alphanumeric string. It may be a file name which points to a text or graphic file. The abbreviation for this type is "S".
- Example: Object Name, free text string containing the object name

Intentionally Blank

ANNEX D – The ECDIS Legend

(IHO ECDIS PRESENTATION LIBRARY, Edition 3.4, January 2008, S-52 ANNEX A of APPENDIX 2, Section 8.6.3)

A standard legend containing at least the following elements should be available for display. It may either be on the same screen as the ECDIS chart display, or on a separate screen. The following table indicates which ENC data elements must be used. Values, other than those defined in the data set record, should reflect the situation at the own ship's position:

1. Units for depth	DUNI subfield of the DSPM field
2. Units for height	HUNI subfield of the DSPM field.
Note on 1., 2. – units for depth and height: although the ENC Product Specification of S-57 does not allow any other than metric depths and heights, these two elements may be stated for the information of unfamiliar users.	
3. Scale of display	Selected by user. (The default display scale is defined by the CSCL). M_CSCL object.)
4. Data quality indicator	a. CATZOC attribute of the M_QUAL object for bathymetric data. b. POSACC attribute of the M_ACCY object (if available) for non-bathymetric data.
Note: due to the way quality is encoded in the ENC, both values (a and b) must be used.	
5. Sounding/vertical datum	SDAT and VDAT subfields of the DSPM field or the VERDAT attribute of the M_SDAT object and M_VDAT object. (VERDAT attributes of individual objects must not be used for the legend.)
6. Horizontal datum	HDAT subfield of the DSPM field
7. Value of safety depth	Selected by user. Default is 30 metres
8. Value of safety contour	Selected by user. Default is 30 metres
Note: if the mariner selected a contour that is not available in the ENC and the ECDIS displays a default contour, both the contour selected and the contour displayed should be quoted.	
9. Magnetic variation	VALMAG, RYRMGV and VALACM of the MAGVAR object. Item must be displayed as VALMAG RYRMGV (VALACM) e.g., 4°15W 1990 (8'E)
10. Date and number of latest update affecting chart cells currently in use.	ISDT and UPDN subfields of the DSID field of the last update cell update file (ER data set) applied.
11. Edition number and date of the ENC.	EDTN and UADT subfields of the DSID field of the last EN data issue of current ENC issue of the ENC set.
12. Chart projection	Projection used for the ECDIS display (e.g., oblique azimuthal).

The list above is the minimum that should be available, but the complete list need not always be shown. Individual items might be picked by the mariner for display for a period; examples are magnetic variation, data quality for depths (M_QUAL, CATZOC) etc.