Changes to S-101 DCEG Edition 1.0.1

Summary Report

S-101PT8 Meeting 06-07 December 2021

DCEG SUB-GROUP APPROVED: INDICATION OF CONDITIONAL MANDATORY ATTRIBUTES

International Hydrographic Organization

FR	all		ge	§2.4.3 provides extensive and useful details on the mandatory/conditional attributes. Yet, it might be useful, in the section tables that list the allowed attributes for a specific feature, to identify visually conditional attributes or attributes that have a specific constraint (ex: colour pattern; restriction + category of restricted area, signal group (mandatory, except on Fixed lights), etc. This would clearly draw the encoder attention to look for additional guidance elsewhere in the document.	Suggest to visually identify (underlined/bold characters?) in the tables, any conditional attribute.	**Have included a new superscript "†" in the "Multiplicity" column and associated guidance at the end of the attribute lists. Clauses 2.4.3 and 2.6 also amended accordingly.** **To be confirmed.**

DCEG Clause 2.4.3

NOTE 1: Sub-attributes of complex attributes, as well as the complex attribute itself, may also be designated as mandatory (see NOTE 2 below). "Conditional" mandatory attributes are identified in the Tables below by the supercript †, with qualifying comments included after the attribute list for the relevant feature; and are also indicated in Table 2.3 above by the following additional text:

file reference	*(TXTDSC)* *(NTXTDS)*		(S) TE	0,1 †
headline			(S) TE	0,1
language		ISO 639-2/T	(S) TE	0,1
text	*(INFORM)* *(NINFOM)*		(S) TE	0,1 †

† For each instance of **information**, at least one of the sub-attributes **file reference** or **text** must be populated.

DCEG SUB-GROUP APPROVED: MANDATORY ATTRIBUTES AND SCALE MINIMUM TABLES

International Hydrographic Organization

DE	2.4.3	Table 2.3	ge	For the better understanding subtitles comparable to them in the table Table 2.1 - Features permitted for ENC and their geometric primitives - should be added	subtitles comparable to them in the table Table 2.1 - Features permitted for ENC and their geometric primitives - should be added	Assume this comment relates to adding the sub-headings for type. **Change applied.**
DE	2.5.9	Table 2.7	ge	For the better understanding subtitles comparable to them in the table Table 2.1 - Features permitted for ENC and their geometric primitives - should be added	subtitles comparable to them in the table Table 2.1 - Features permitted for ENC and their geometric primitives - should be added	**Applied.**

Feature	Mandatory Attributes
GEO FEATURES	
Administration Area	jurisdiction
Archipelagic Sea Lane Area	nationality*
Archipelagic Sea Lane Axis	nationality*

FEATURE	PRIMITIVE	CONDITION	scale minimum STEPS
GEO FEATURES			
Administration Area	Surface		3
Airport/Airfield	Point/Surface	If **visual prominence** = *1* (visually conspicuous)	3

DCEG SUB-GROUP APPROVED: PORTRAYAL AND „SYSTEM“ ATTRIBUTES

International Hydrographic Organization

2.4.5 Portrayal feature attributes

The primary use of ENC is within ECDIS where ENC data is displayed based on the rules defined within the S-101 Portrayal Catalogue. While most ECDIS portrayal is based on attributes describing the instance of a particular feature in the real world, certain feature attributes are used in portrayal rules to provide additional functionality in the ECDIS or information to the mariner. The following attributes have specific influence on portrayal:

display name – this Boolean attribute determines if the text for a name should display. If not populated the default rules provided in the portrayal catalogue will be used.

fixed date range; **periodic date range** – population of these complex attributes determines when the feature will be added (sub-attribute **date start**) and/or removed (sub-attribute **date end**) from the display in some ECDIS display settings (see clause 2.4.8).

information – population of this complex attribute (included in an associated instance of the information type **Nautical Information** (see clause 24.4)) will result in the display of the magenta information symbol to highlight additional information to the user.

pictorial representation – population of this attribute (included in an associated instance of the information type **Nautical Information** (see clause 24.4)) will result in the display of the magenta information symbol to highlight additional information to the user.

scale minimum – value at which the feature will be removed from the display if application of scale minimum is enabled in the ECDIS (see clause 2.5.9).

visual prominence – this attribute determines that visually conspicuous features are shown in black colour rather than brown.

2.4.5.1 ECDIS “system” (portrayal) attributes

Attributes designated as “ECDIS system” attributes are intended to provide information specific to aiding in portrayal of features in ECDIS in certain circumstances; and should be automatically populated by the ENC production software as required. The population of these attributes are conditional dependant on individual encoding instances including the relationship between an encoded feature and the underlying Skin of the Earth feature; and resolution of conflicts in portrayal specific to collocated light features. These attributes are described in Section 30 of this document, and include:

default clearance depth (see clause 30.1) – this attribute is intended to provide a depth value to aid in the display of underwater hazards (**Obstruction**, **Underwater/Awash Rock**, **Wreck**) where the actual depth of the underwater hazard is unknown. This value is algorithmically calculated by the production system as required, based on the value populated for the ECDIS system attribute **surrounding depth** (see below).

flare angle (see clause 30.2) – defines the orientation direction of a light flare where more than one all around light is collocated so as to avoid the light flares from being coincident in the ECDIS display. This attribute is automatically calculated and populated as required by the ENC production software.

in the water (see clause 30.3) – this Boolean attribute provides an indication to the ECDIS that features that are located in or over navigable water are to be included in the ECDIS Base Display. This attribute is automatiacally populated by the ENC production software where a structure is located over an area of bathymetry (**Depth Area**, **Dredged Area**, **Unsurveyed Area**).

sector extension (see clause 30.4) – this attribute defines a distance, beyond the default distance, at which a light sector arc will be displayed where more than one sector light having overlapping sectors has been encoded. This attribute is automatically calculated and populated as required by the ENC production software. Note that **sector extension** is not ustilised where light sectors are displayed at the nominal range of the sectors.

surrounding depth (see clause 30.5) – this attribute defines a depth value for the area surrounding an underwater hazard of unknown depth, and is based on the **depth range minimum value** for the surrounding **Depth Area**. This attribute is automatically calculated and populated as required by the ENC production software.

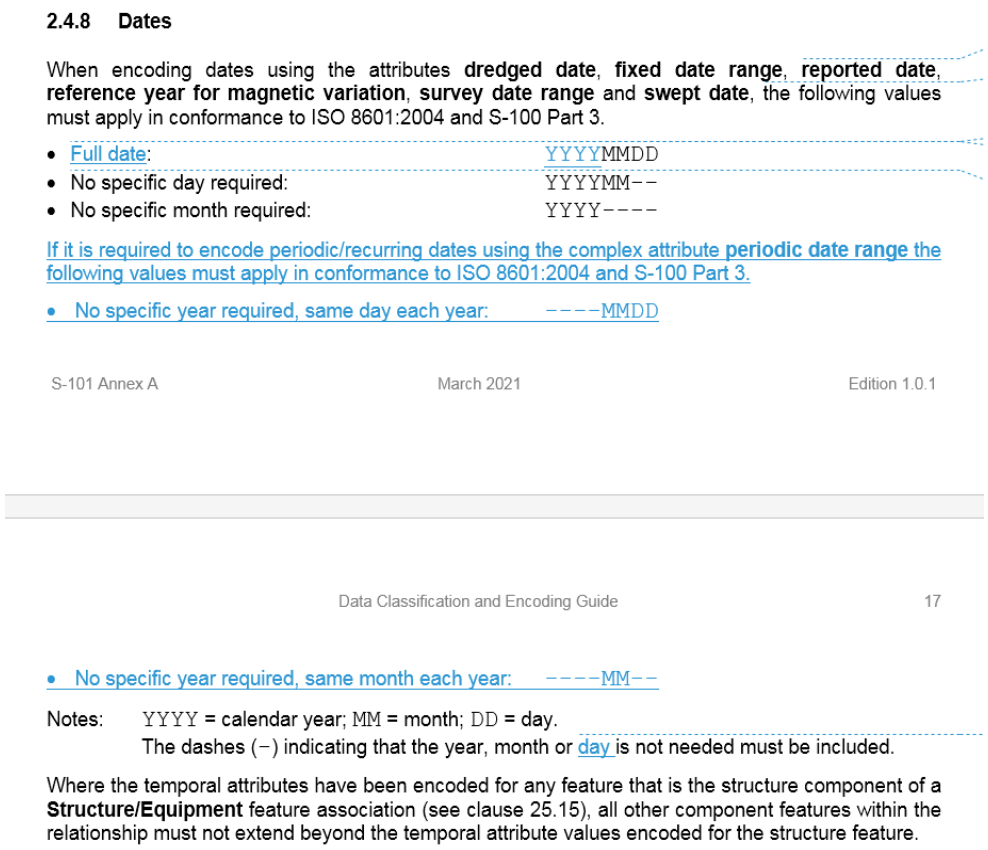
Teh Stand
Deleted: in the water – this Boolean attribute determines that features that are located in or over navigable water are included in the ECDIS Base Display.→¶

S-101PT8 Meeting 06-07 December 2021

DCEG SUB-GROUP APPROVED: DATES

International Hydrographic Organization

rmm	2.4.8 Dates	bullet list of examples	ed	Examples should use a monospaced font so there is no ambiguity about how many dashes are used (and increase the point size as necessary - Courier New at the same point size is harder to read than Arial).	Change ----MMDD (Arial) to ----MMDD (Courier New), etc.	**Applied.**



2.4.8 Dates

When encoding dates using the attributes **dredged date**, **fixed date range**, **reported date**, **reference year for magnetic variation**, **survey date range** and **swept date**, the following values must apply in conformance to ISO 8601:2004 and S-100 Part 3.

- Full date: YYYYMMDD
- No specific day required: YYYYMM--
- No specific month required: YYYY----

If it is required to encode periodic/recurring dates using the complex attribute **periodic date range** the following values must apply in conformance to ISO 8601:2004 and S-100 Part 3.

- No specific year required, same day each year: ----MMDD

S-101 Annex A March 2021 Edition 1.0.1

Data Classification and Encoding Guide 17

- No specific year required, same month each year: ----MM--

Notes: YYYY = calendar year; MM = month; DD = day.
The dashes (-) indicating that the year, month or day is not needed must be included.

Where the temporal attributes have been encoded for any feature that is the structure component of a **Structure/Equipment** feature association (see clause 25.15), all other component features within the relationship must not extend beyond the temporal attribute values encoded for the structure feature.

DCEG SUB-GROUP APPROVED: REFERENCE TO ALLOWABLE SCALE VALUES

International Hydrographic Organization

FR	3.4		te	Reference to Table 3.1 could be added in the Allowable Encoding Value (as it is, it seems that < or > are the only conditions.	Add: "See Table 3.1 below".	**Applied.**

3.4 Data coverage

IHO Definition: **DATA COVERAGE**. A geographical area that describes the coverage and extent of spatial types. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 1, Page 1.210, November 2000).				
S-101 Metadata Feature: Data Coverage (M_COVR) *(M_CSCL)*				
Primitives: Surface				
Real World	*Paper Chart Symbol*	*ECDIS Symbol*		
S-101 Attribute	**S-57 Acronym**	**Allowable Encoding Value**	**Type**	**Multiplicity**
maximum display scale		See Table 3.1 below maximum display scale < minimum display scale	IN	1,1
minimum display scale		See Table 3.1 below minimum display scale > maximum display scale	IN	1,1

maximum display scale	minimum display scale
10,000,000	empty (null)
3,500,000	10,000,000
1,500,000	3,500,000
700,000	1,500,000
350,000	700,000
180,000	350,000
90,000	180,000
45,000	90,000
22,000	45,000
12,000	22,000
8,000	12,000
4,000	8,000
3,000	4,000
2,000	3,000
1,000	2,000

Table 3.1 – Maximum and minimum display scale values

DCEG SUB-GROUP APPROVED: SOUNDING DATUM

International Hydrographic Organization

LR	3.8.1	2	te	When DCEG says about comparing Sounding datum with a default value of the [VDAT] subfield of the [CSID] field, we have to specify which of the VDAT should be used. Vertical Datum in a dataset must be specified with AXTY sub-field equal to 12: Gravity Related Depth. Besides of that VDAT is field and a value of the Sounding datum is defined by DTNM and DTID subfield.	Rewording of the 2nd paragraph: ***The default value for the entire dataset must be given in the Datum Name [DTNM] and Datum Identifier [DTID] subfields of the Vertical Datum [VDAT] field of the Coordinate Reference System Record where the "Axis Type" [AXTY] subfield of the "Coordinate System Axes" [CSAX] field is equal to 12 (Gravity Related Depth).***	Applied with some slightly modified wording. **To be confirmed.**

3.8.1 Sounding datum

Sounding datum information is encoded in the dataset metadata or by the meta feature **Sounding Datum**, and must be constant over large areas. The values encoded in the attributes **value of sounding**, **depth range minimum value**, **depth range maximum value** and **value of depth contour**, and the sounding values encoded in **Sounding** features (positive values down), are referenced to this datum.

The default value for the entire dataset must be given in the "Datum Name" [DTNM] and "Datum Identifier" [DTID] subfields of the "Vertical Datum" [VDAT] field of the "Dataset Coordinate Reference System" record where the "Axis Type" [AXTY] subfield of the "Coordinate System Axes" [CSAX] of the "Dataset Coordinate Reference System" record is set to *12* (Gravity Related Depth).

If the sounding datum for an area is different from the value given in the [VDAT] subfield for the dataset, it must be encoded using **Sounding Datum**. The areas covered by these meta features must not overlap. If it is required to encode a sounding datum for individual features that is different from the dataset header, or a **Sounding Datum** feature covering the features, it must encoded using the attribute **vertical datum** on the individual features.

Depth contours, grouped soundings and depth areas going across areas having different values of sounding datum must be split at the border of those areas. Other features that should be split include **Marine Farm/Culture**, **Obstruction** and **Wreck**, but only where the value of **value of sounding** is known; and **Berth**, **Cable Submarine**, **Deep Water Route Centreline**, **Deep Water Route Part**, **Dredged Area**, **Dry Dock**, **Fairway**, **Floating Dock**, **Gate**, **Pipeline Submarine/On Land**, **Recommended Route Centreline**, **Recommended Track**, **Swept Area**, **Two-Way Route Part** and **Quality of Bathymetric Data**, but only if the value of **depth range minimum value** and/or **depth range maximum value** is known.

Remarks:
- No remarks.

Distinction: Vertical Datum.

Teh Stand
Deleted: Vertical

Teh Stand
Deleted: sub

Teh Stand
Deleted: Record

Teh Stand
Deleted: Identifier" [CSID] field

DCEG SUB-GROUP APPROVED: VERTICAL DATUM

International Hydrographic Organization

LR	3.9.1	2	te	When DCEG says about comparing Vertical datum with a default value of the [VDAT] subfield of the [CSID] field, we have to specify which of the VDAT should be used. Vertical Datum in a dataset must be specified with AXTY sub-field equal to 11: Gravity Related Height. Besides of that VDAT is field and a value of the Vertical datum is defined by DTNM and DTID subfield.	Rewording to: *The default value for the entire dataset must be given in the Datum Name [DTNM] and Datum Identifier [DTID] subfields of the Vertical Datum [VDAT] field of the Coordinate Reference System Record* ***where the "Axis Type" [AXTY] subfield of the "Coordinate System Axes" [CSAX] field is equal to 11 (Gravity Related Height).***	Applied with some slightly modified wording. **To be confirmed.**

3.9.1 Vertical datum

Vertical datum information is encoded in the dataset metadata, using the meta feature **Vertical Datum of Data**, or by populating the attribute **vertical datum** on individual geo features. The values encoded in the attributes **elevation**, **height** and **clearance vertical** (positive values up) are referenced to the specified datum(s). **vertical datum** must not be encoded on any feature unless at least one of the above attributes is also encoded on that feature.

The default value for the entire dataset must be given in the "Datum Name" [DTNM] and "Datum Identifier" [DTID] subfields of the "Vertical Datum" [VDAT] field of the "Dataset Coordinate Reference System" record where the "Axis Type" [AXTY] subfield of the "Coordinate System Axes" [CSAX] of the "Dataset Coordinate Reference System" record is set to *11* (Gravity Related Height).

If the vertical datum for an area is different from the value given in the VDAT subfield for the dataset, it must be encoded using **Vertical Datum of Data**. The areas covered by these meta features must not overlap.

Height contours, going across areas having different values of vertical datum, must be split at the border of these areas.

DCEG SUB-GROUP APPROVED: BALTIC SEA CHART DATUM 2000

International Hydrographic Organization

SE	3.9		TE	Value 44 (Baltic Sea Chart Datum 2000) must be possible to use for Vertical Datum of Data	Add 44 (Baltic Sea Chart Datum 2000) as allowable encoding value.	**Applied.**

44) **baltic sea chart datum 2000**

IHO Definition: The datum refers to each Baltic country's realization of the European Vertical Reference System (EVRS) with land-uplift epoch 2000, which is connected to the Normaal Amsterdams Peil (NAP). (Baltic Sea Hydrographic Commission).

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
vertical datum	(VERDAT)	3 : mean sea level 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide 44 : baltic sea chart datum 2000	EN	1,1

DCEG SUB-GROUP APPROVED: UPDATE INFORMATION

International Hydrographic Organization

rmm	3.11 25.19	Feature UpdateInformation Association UpdatedInformation	ed	0..1 multiplicity for the updates role in the DCEG implies that in case of successive updates to the same geo instance, the association between the previous UpdateInformation instance and the geo instance must be broken in some way.	Clarify what is to be done in case of successive updates to a geo feature instance. Siggested solutions: (1) Break the old association. If there are no remaining geo features to which the old UpdateInformation is linked, the old UpdateInformation feature can also be deleted. The new UInfo must include info about the previous update as appropriate. (2) Change the multplicity of the updates role to 0..* and add dateStart to UpdateInformation so the sequence of updates can be detected.	Given that the purpose of Update Information is only to provide information relevant to a new Update, have gone with option (1). Have added a new sentence to clause 3.11.1, Remarks 3rd bullet. **To be reviewed.**

3.11.1 Update information

If it is required to encode information about changes made to ENC data it must be done using **Update Information**. This feature must be encoded to cover the extent of changed data incorporated in the SENC via ENC Updates (ER Application Profile), and may also be used to indicate changes introduced in ENC New Editions. It carries information about the changes. **Update Information** may be associated with features which have changed using the association **Updated Information** (see clause 25.19).

Remarks:

- The mandatory attribute **update description** must be used to provide a brief textual description of the changes to the dataset included in the Update. If a more detailed description of the Update is required, this should be encoded using an associated instance of the information type **Nautical Information** (see clause 24.4), complex attribute **information**.
- The attribute **source** may be used to indicate the related paper chart notice to mariner's number.
- At each new edition of an ENC cell **Update Information** features which are no longer relevant must be deleted; and for the next Update to an ENC cell **Update Information** features included in the previous Update dataset should be considered for deletion. Where a new Update impacts a feature that has previously been updated, any existing instance of **Update Information** associated to the feature must be deleted as part of the new Update; this may be done by deleting the existing **Update Information** from the dataset, or by removing the impacted feature(s) from the association **Updated Information** if there are features included in the association that are not impacted by the new Update.
- Where information has been deleted from an ENC the **Update Information** feature should cover the extent of the deleted information.

DCEG SUB-GROUP APPROVED: CABLE OVERHEAD AS STRUCTURE FEATURE

International Hydrographic Organization

rmm	6.9, 18.1, 25.15	feature associations	te	DCEG 18.1 says CableOverhead features can act as structure features. 6.9 lists the Structure/Equipment association as one of the allowed associations for CableOverhead. 25.15 does not list CableOverhead as a structure feature	Reconcile.	**Change applied at clause 25.15.**

25.15 Structure/equipment

Structure/Equipment: IHO Definition: A feature association for the binding between a navigation aid equipment feature and the structure that supports it.

Remarks:

- A **Structure/Equipment** composition binds a single "Supported by" feature to at least one "Supports" feature.

Role Type	Role	Associated With	Multiplicity
Composition	Supported by	**Beacon Cardinal**, **Beacon Isolated Danger**, **Beacon Lateral**, **Beacon Safe Water**, **Beacon Special Purpose/General**, **Bridge**, **Building**, **Buoy Cardinal**, **Buoy Installation**, **Buoy Isolated Danger**, **Buoy Lateral**, **Buoy New Danger Marking**, **Buoy Safe Water**, **Buoy Special Purpose/General**, **Crane**, **Conveyor**, **Daymark**, **Fishing Facility**, **Floating Dock**, **Fortified Structure**, **Hulk**, **Landmark**, **Light Float**, **Light Vessel**, **Mooring/Warping Facility**, **Offshore Platform**, **Pile**, **Pipeline Overhead**, **Pontoon**, **Pylon/Bridge Support**, **Shoreline Construction**, **Silo/Tank**, **Span Fixed**, **Span Opening**, **Wind Turbine**, **Wreck**	0,1 {1,1 [C]}
	Supports	**Daymark**, **Fog Signal**, **Light All Around**, **Light Fog Detector**, **Light Sectored**, **Physical AIS Aid to Navigation**, **Radar Transponder Beacon**, **Retroreflector**, **Signal Station Traffic**, **Signal Station Warning**, **Silo/Tank**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Bridge**, **Building**, **Crane**, **Conveyor**, **Landmark**, **Offshore Platform**, **Pylon/Bridge Support**, **Span Fixed**, **Span Opening**, **Wind Turbine**	0,1 {1,1 [C]}
	Supports	**Light Air Obstruction**	0,*
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Light All Around**, **Light Sectored** [1]	0,1 {1,1 [C]}
	Supports	**Fog Signal**, **Light Air Obstruction**, **Light All Around**, **Light Fog Detector**, **Light Sectored**, **Radar Transponder Beacon**, **Retroreflector**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Daymark**	0,1
	Supports	**Fog Signal**, **Light All Around**, **Light Fog Detector**, **Light Sectored**, **Physical AIS Aid to Navigation**, **Radar Transponder Beacon**, **Retroreflector**, **Signal Station Traffic**, **Signal Station Warning**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Cable Overhead** [2]	0,1
	Supports	**Radar Reflector**	0,*

DCEG SUB-GROUP APPROVED: WRECK AS STRUCTURE FEATURE

International Hydrographic Organization

rmm	13.5, 18.1, 25.15	feature associations	te	DCEG 18.1 says Wreck features can act as structure features. 13.5 does not mention the Structure/Equipment association. 25.15 does not list Wreck as a structure feature	Reconcile	**Change applied at clause 25.15.**

25.15 Structure/equipment

Structure/Equipment: IHO Definition: A feature association for the binding between a navigation aid equipment feature and the structure that supports it.

Remarks:

- A **Structure/Equipment** composition binds a single "Supported by" feature to at least one "Supports" feature.

Role Type	Role	Associated With	Multiplicity
Composition	Supported by	**Beacon Cardinal**, **Beacon Isolated Danger**, **Beacon Lateral**, **Beacon Safe Water**, **Beacon Special Purpose/General**, **Bridge**, **Building**, **Buoy Cardinal**, **Buoy Installation**, **Buoy Isolated Danger**, **Buoy Lateral**, **Buoy New Danger Marking**, **Buoy Safe Water**, **Buoy Special Purpose/General**, **Crane**, **Conveyor**, **Daymark**, **Fishing Facility**, **Floating Dock**, **Fortified Structure**, **Hulk**, **Landmark**, **Light Float**, **Light Vessel**, **Mooring/Warping Facility**, **Offshore Platform**, **Pile**, **Pipeline Overhead**, **Pontoon**, **Pylon/Bridge Support**, **Shoreline Construction**, **Silo/Tank**, **Span Fixed**, **Span Opening**, **Wind Turbine**, **Wreck**	0,1 {1,1 [C]}
	Supports	**Daymark**, **Fog Signal**, **Light All Around**, **Light Fog Detector**, **Light Sectored**, **Physical AIS Aid to Navigation**, **Radar Transponder Beacon**, **Retroreflector**, **Signal Station Traffic**, **Signal Station Warning**, **Silo/Tank**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Bridge**, **Building**, **Crane**, **Conveyor**, **Landmark**, **Offshore Platform**, **Pylon/Bridge Support**, **Span Fixed**, **Span Opening**, **Wind Turbine**	0,1 {1,1 [C]}
	Supports	**Light Air Obstruction**	0,*
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Light All Around**, **Light Sectored** [1]	0,1 {1,1 [C]}
	Supports	**Fog Signal**, **Light Air Obstruction**, **Light All Around**, **Light Fog Detector**, **Light Sectored**, **Radar Transponder Beacon**, **Retroreflector**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Daymark**	0,1
	Supports	**Fog Signal**, **Light All Around**, **Light Fog Detector**, **Light Sectored**, **Physical AIS Aid to Navigation**, **Radar Transponder Beacon**, **Retroreflector**, **Signal Station Traffic**, **Signal Station Warning**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Composition	Supported by	**Cable Overhead** [2]	0,1
	Supports	**Radar Reflector**	0,*

DCEG SUB-GROUP APPROVED: LIGHTS - CORRECTION OF ISO 8211 SUBFIELDS

International Hydrographic Organization

LR	19.2.1 – 19.5.1	Remarks, bullets	te	See the comment above for 3.9.1 Vertical Datum	Rewording to : *The attribute vertical datum applies only to height; this value must only be encoded if it is different from the value encoded in* ***Datum Identifier [DTID] subfields of the VDAT field*** *of the Coordinate Reference System Record* ***where the "Axis Type" [AXTY] subfield of the "Coordinate System Axes" [CSAX] field is equal to 11 (Gravity Related Height),*** *or different from the value of vertical datum encoded on meta feature Vertical Datum of Data.*	Applied with some slightly modified wording. **To be confirmed.**

- Lights on land encoded as major lights (Boolean attribute **major light** = *True*) must have a structure feature encoded (see clause 19.1.8) in order for the position of the light to be clearly indicated in the ECDIS.
- The attribute **vertical datum** applies only to **height**; this value must only be encoded if it is different from the values encoded in the "Datum Name" [DTNM] and "Datum Identifier" [DTID] subfields of the VDAT field of the "Coordinate Reference System" record where the "Axis Type" [AXTY] subfield of the "Coordinate System Axes" [CSAX] of the "Dataset Coordinate Reference System" record is set to *11* (Gravity Related Height), or different from the value of **vertical datum** encoded on meta feature **Vertical Datum of Data**.

DCEG SUB-GROUP APPROVED: SMALL CRAFT FACILITIES

International Hydrographic Organization

LR	22.8.1	Remarks, 2nd bullet	te	Categories of Small Craft Facility like a public inn, restaurant, fuel station, mechanics workshop and others could be placed in a hulk. We suggest to add the Hulk feature type to features list in the 2nd bullet of remarks.	Amended encoding guidance in the 2nd bullet of Remarks: Due to possible ECDIS display issues Small Craft Facility features of type area should only be encoded on Land Area, Shoreline Construction, Hulk or Pontoon features of type area.	Am hoping that this ECDIS display issue can be resolved in S-101 portrayal, however for now am happy to apply this change. **Applied.**

22.8.1 Small craft facilities (see S-4 – B-320.1-2)

If it is required to encode a small craft facility, it must be done using the feature **Small Craft Facility**.

Remarks:

- The **Small Craft Facility** must only be used to encode the function. In addition, if it is required to encode a physical feature (for example building, mooring buoy), it must be done using an appropriate feature (for example **Building**, **Mooring/Warping Facility**).
- Due to possible ECDIS display issues **Small Craft Facility** features of type surface should only be encoded on **Land Area**, **Shoreline Construction**, **Hulk** or **Pontoon** features of type surface.

DCEG SUB-GROUP APPROVED: CALL SIGN - DEFINITION

International Hydrographic Organization

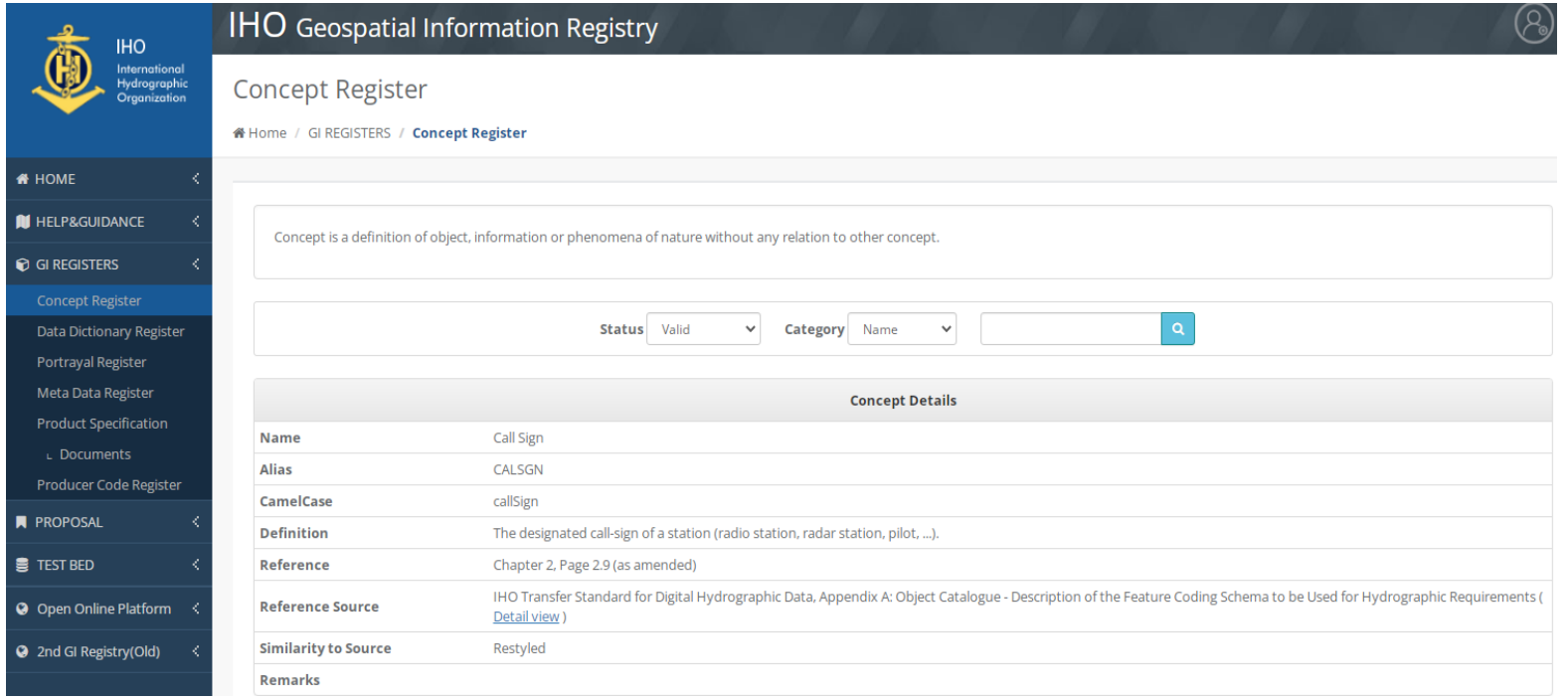
LR	27.6	IHO Definition :	ed	The current definition of the call-sign attribute has been taken from initial text of "(S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.9, November 2000)". However, according to the S-57 MAINTENANCE DOCUMENT Number 8 - March 2002, MD5.Co.1, the definition has been changed to: The designated call-sign of a ~~radio~~ station (radio station, radar station, pilot …)	Amended definition for call sign attribute: The designated call-sign of a station (radio station, radar station, pilot, …)(	Agree, as this is the latest IHO approved definition for this term. **Applied. (also in the IHO GI Registry)**

27.6 call sign (CALSGN)

Call sign: IHO Definition: The designated call-sign of a station (radio station, radar station, pilot, …). (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.9, November 2000 (as amended)).

Attribute Type: Free Text

Remarks:
- No remarks.



DCEG SUB-GROUP APPROVED: FILE LOCATOR

International Hydrographic Organization

rmm	27.95 fileLocator	Remark 2nd bullet	te	The fileLocator attribute was devised by NIPWG. The purpose of fileLocator is that it can be used to automatically position the text. Section headings, clause numbers, and page numbers do not allow this. They require viewers to do a rather inefficient text search through the file, which may may not even lead to the correct location (e.g., in plain text files, page numbers and section numbers are just ordinary strings; two different sections can have sub-sections with the same headings). Positioning in text files requires an integer offset from the beginning. Many code libraries have functions that can use this offset to move to the specified location. HTML and XML files have fragment identifiers which can be used by browsers or other tools to position the file in a viewer. S-98 Annex C clause 13.5 covers this from the developers' point of view. fileLocator is used in multiple product specifications and standardization is important. Section titles, including the number, should be in the headline attribute (27.102) which is a co-attribute of fileLocator within the information complex attribute.	Replace the second Remarks bullet with the following: • The value populated in fileLocator depends on the type of file: ○ plain-text (S-100 support file format = "ASCII"): The offset of the start of the section relative to the beginning of the file (the first character in the file has offset 0). ○ HTML: An HTML fragment identifier; this is the value of the name or id attribute of an HTML element in the file. ○ XML: XML fragment identifier, i.e., the value of an xml:id attribute of an element in the file. • The type of file is provided in the support file discovery metadata block (see S-100 Part 4a App. 4a-D S100_SupportFileFormat).	**Applied.** However, question as to whether the Example included for this attribute is still appropriate, taking into account these changes. **Discuss with Raphael.**

27.95 file locator

File locator: IHO Definition: The location of a fragment of text or other information in a support file.

Attribute Type: Free text

Indication: The string encodes the location of a single fragment of text or other information contained in a support file.

Example: **p-224.105(a)(1)**

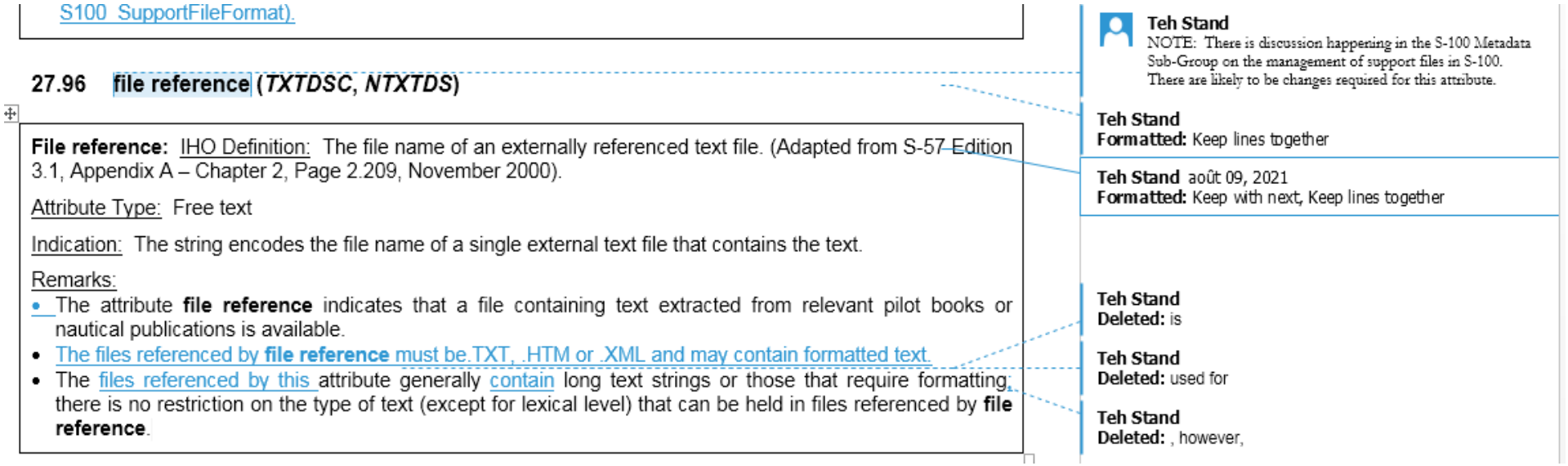
Remarks:

- The attribute **file locator** indicates the location of a section of text within the file referenced by the attribute **file reference** that is relevant for a particular feature.
- The value populated for **file locator** depends on the type of file:
  - Plain-text (S-100 support file format = "ASCII"): The offset of the start of the section relative to the beginning of the file (the first character in the file has offset 0).
  - HTML: A HTML fragment identifier; this is the value of the *name* or *id* attribute of a HTML element in the file.
  - XML: XML fragment identifier; that is, the value of an *xml:id* attribute of an element in the file.
- The type of file is provided in the support file discovery metadata block (see S-100 Part 4a Appendix 4a-D

DCEG SUB-GROUP APPROVED: FILE REFERENCE

International Hydrographic Organization

rmm	27.96 fileReference 29.9; 31.2.2 (7); 31.2.3 (11)	27.96 Remarks, 2nd bullet		In 27.96: "the attribute is used for long text strings..." is a bit misleading and appears to contradict the definition in the same clause, suggesting that such text strings can be encoded directly in the fileReference attribute. The other locations cited in the Clause No. column also have this problem.	27.96: Revise bullet point 2: The files referenced by this attribute ~~is~~ generally ~~used for~~ contain long text strings or those that require formatting, however... Other clauses listed: Revise phrasing to remove similar ambiguity.	**Applied (with some amendments, including the addition of a new bullet specifying the allowable file formats.** **Changes to other referenced clauses applied.**



S100_SupportFileFormat).

27.96 file reference (*TXTDSC*, *NTXTDS*)

File reference: IHO Definition: The file name of an externally referenced text file. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.209, November 2000).

Attribute Type: Free text

Indication: The string encodes the file name of a single external text file that contains the text.

Remarks:

- The attribute **file reference** indicates that a file containing text extracted from relevant pilot books or nautical publications is available.
- The files referenced by **file reference** must be.TXT, .HTM or .XML and may contain formatted text.
- The files referenced by this attribute generally contain long text strings or those that require formatting; there is no restriction on the type of text (except for lexical level) that can be held in files referenced by **file reference**.

Teh Stand
NOTE: There is discussion happening in the S-100 Metadata Sub-Group on the management of support files in S-100. There are likely to be changes required for this attribute.

Teh Stand
Formatted: Keep lines together

Teh Stand août 09, 2021
Formatted: Keep with next, Keep lines together

Teh Stand
Deleted: is

Teh Stand
Deleted: used for

Teh Stand
Deleted: , however,

DCEG SUB-GROUP APPROVED: HORIZONTAL CLEARANCE VALUE

International Hydrographic Organization

7Cs	27.105		TE	Is there really a need to have two attributes horizontal clearance value and horizontal clearance width with the same definition except that value is for canal and tunnel, width for lock and basin. width could be used for canal and tunnel as well.		This is a good pickup given that there must not be different concepts having the same definition. The distinction between horizontalClearanceValue and horizontalClearanceWidth is that horizontalClearanceValue is used to define the physical horizontal clearance for the feature (this is why it is included as a sub-attribute, along with the sub-attribute horizontalDistanceUncertainty, in the complex attributes horizontalClearanceClosed and horizontalClearanceOpen); and horizontalClearanceWidth is used to define a regulatory horizontal clearance as defined by a competent regulatory authority (if such a regulation exists). **Have amended the definition for horizontalClearanceValue in the DCEG and flagged this as an issue for discussion, noting that this will also impact on the GI Registry.**

27.105 horizontal clearance value (HORCLR)

Horizontal clearance value: IHO Definition: The physical horizontal clearance distance between two points on a feature, such as a bridge span, dock, gate, lock or tunnel.

Attribute Type: Real

Unit: Defined as an attribute in the ENC dataset metadata: metre (m)

Resolution: 0·1m

Format: xx.x

Example: **125** for a horizontal clearance of 125 metres

Remarks:

- No remarks.

Deleted: width

Teh Stand
Deleted: of

Teh Stand
Deleted: canal or a tunnel

Teh Stand
Deleted: , which is available for safe navigation. This may, or may not, be the same as the total physical width of the feature. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.137, November 2000)

DCEG SUB-GROUP APPROVED: REINTRODUCING INFORMATION ON GEO FEATURES

International Hydrographic Organization

Reference: Paper for S-101PT8: *Proposal to Rebind Complex Attribute information to S-101 Geo Features*

2.4.6 Textual information

The complex attribute **information** contains information as text using the sub-attribute **text**, or the name of an external file using the sub-attribute **file reference**; and where bound to the geo feature classes may be used to encode additional textual information specific to a single feature instance.

The information type **Nautical Information** (see clause 24.4) should be used to encode additional textual information associated to a group of features. The **Nautical Information** is associated to the relevant features using the association **Additional Information** (see clause 25.1).

The complex attribute **information** must not be used when it is possible to encode the information by means of any other attribute. Under certain ECDIS display settings the "information" symbol will display when this attribute is populated. Therefore producers should carefully consider use of this attribute as the symbol may contribute significantly to ECDIS screen clutter.

Character strings contained in **information** sub-attribute **text** must be UTF-8 character encoding. **Information** should generally be used for short notes or to transfer information which cannot be encoded by other attributes, or to give more detailed information about a feature. Text populated in **text** must not exceed 300 characters.

The exchange language for textual information should be English, therefore it is not required to populate the sub-attribute **language** for an English version of textual information. Languages other than English may be used as a supplementary option, for which **language** must be populated with an appropriate value to indicate the language. Generally this means, when a national language is used in the textual attributes, the English translation must also exist.

Remarks:
- For Guidance on encoding names of features, see clause 2.5.8.

2.4.12 Attributes referencing external files

The complex attribute **information** and its sub-attribute **file reference** on the information type **Nautical Information** (see clause 24.2) or on individual geo features references textual support files. The simple attribute **pictorial representation** on **Nautical Information** or on individual geo features references picture files. The association **Additional Information** (see clause 25.1) is used to create an association between the geo feature(s) and **Nautical Information** where required. Where the information is relevant to a single feature instance only, it should be enoced using **information** or **pictorial representation** on the feature instance. Where the information is relevant to multiple feature instances, it should be encoded using **information** or **pictorial representation** on an associated instance of **Nautical Information**. See also clause 2.4.6.

The attributes **information** and **pictorial representation** are considered portrayal feature attributes (see clause 2.4.5), meaning that under given circumstances the "information" symbol (magenta "i") will be portrayed in ECDIS when one or both of these attributes are populated. Due to risk of ECDIS screen clutter, producers should carefully consider the use of these attributes.

These attributes must not be used when it is possible to encode the information by means of any other attribute.

Clause 11.2 of the S-101 Product Specification main document specifies the content of an exchange set and the inclusion of support files. Clause 11.4 of the Product Specification main document outlines specific rules and limitations for support file management.

6.1 Built-up area

IHO Definition: **BUILT-UP AREA.** An area of land or construction over the water containing a concentration of buildings and/or other structures. (Adapted from Defence Geospatial Information Working Group; Feature Data Dictionary Register, 2010).

S-101 Geo Feature: Built-Up Area (BUAARE)

Primitives: Point, Surface

Real World	*Paper Chart Symbol*	*ECDIS Symbol*

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
category of built-up area	(CATBUA)	1 : urban area 2 : settlement 3 : village 4 : town 5 : city 6 : holiday village	EN	0,1
condition	(CONDTN)	1 : under construction 2 : ruined 5 : planned construction	EN	0,1
feature name			C	0,*
display name			(S) BO	0,1
language		ISO 639-2/T	(S) TE	0,1
name	*(OBJNAM)* *(NOBJNM)*		(S) TE	1,1
height	(HEIGHT)		RE	0,1
radar conspicuous	(CONRAD)		BO	0,1
reported date	*(SORDAT)*	ISO 8601: 2004	TD	0,1
visual prominence	(CONVIS)	1 : visually conspicuous 2 : not visually conspicuous 3 : prominent	EN	0,1
scale minimum	(SCAMIN)	See clause 2.5.9	IN	0,1
information		See clause 2.4.6	C	0,*
file locator			(S) TE	0,1
file reference	*(TXTDSC)* *(NTXTDS)*		(S) TE	0,1 †
headline			(S) TE	0,1
language		ISO 639-2/T	(S) TE	0,1
text	*(INFORM)* *(NINFOM)*		(S) TE	0,1 †
pictorial representation	(PICREP)	See clause 2.4.12.2	TE	0,1

† For each instance of **information**, at least one of the sub-attributes **file reference** or **text** must be populated.

Remarks:
- The relevant regulations, where required, must be encoded using the complex attribute **information** (see clause 2.4.6).

24.4.1 Nautical information

If it is required to encode identical information associated with multiple geo features which cannot be encoded using the descriptive attributes on those features, it should be done using the information type **Nautical Information**. Each instance of **Nautical Information** must be associated to the feature(s) to which the information applies using the association **Additional Information** (see clause 25.1).

Remarks:
- Within a dataset, individual instances of information associated with a geo feature which cannot be encoded using the descriptive attributes on the feature should be encoded using the attributes **information** or **pictorial representation** on the feature itself, not using **Nautical Information**. However where this information is shared between features included in multiple datasets within the ENC portfolio, **Nautical Information** may be used.
- **Nautical Information** must not be used to include a reference to a picture file (attribute **pictorial representation**) to a feature that does not itself include **pictoral reference** as an allowable attribute.
- The complex attributes **fixed date range** and **periodic date range**, when populated for **Nautical**

S-101PT8 Meeting 06-07 December 2021

ACTIONS FROM PORTRAYAL SUB-GROUP: TEXT PLACEMENT

International Hydrographic Organization

Portrayal Sub-Group: It was agreed that the revised modelling as proposed by T-Caris could be included in the DCEG now as the proposed change to S-100 is specific to the portrayal of the text and not the modelling. However, given that there will be an issue with portrayal pending publication of S-100 Edition 5.0.0 it was agreed that the guidance included in the DCEG is to be accompanied by a note to this effect, similar to the note that has been included for the introduction of two alternatives for the encoding of QoBD in DCEG Edition 1.0.1.

27.171 text offst mm

Text offset mm: IHO Definition: The distance in millimetres that text associated with a feature is positioned from the feature in an end-user system.

Attribute Type: Integer

Unit: Defined in relation to the desired distance from the associated feature at the maximum display scale of the ENC data.

Resolution: mm

Format: xx

Example: **45** for a text offset of 45 mm

Remarks:
- None.

2.5.8.1 Text placement

The cartographic feature **Text Placement** (see clause 23.1) is used specifically to place text cartographically. The properties of the text placement feature are described as follows;

Geometry (point) – the spatial point location of the text string.

text type – the attribute (or class) which is to be placed.

orientation value and **text offset mm** – the bearing and distance (at maximum display scale of the ENC data) used to position the text relative to the feature.

The **Text Placement** feature is associated to the feature which carries the text being placed. The attribute **text type** determines which text string is to be displayed if more than one is present. The **Text Placement** feature ensures that as an ECDIS screen rotates from "north up" (for example, if display is set to "course up") text can remain readable, or clear other important charted information.

Deleted: centre of the
Jeff Wootton Deleted: Text
Jeff Wootton Deleted: Flip
Jeff Wootton Deleted: bearing
Jeff Wootton Formatted: Font: Not Bold
Jeff Wootton Deleted: angle forming a semi-ci be placed

23.1 Text placement

IHO Definition: **TEXT PLACEMENT**. The Text Placement feature is used in association with the Feature Name attribute or a light description to optimise text positioning in ECDIS.

S-101 Cartographic Feature: Text Placement

Primitives: Point

Real World	*Paper Chart Symbol*	*ECDIS Symbol*

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
orientation value			RE	1,1
text			TE	0,1 †
text justification		1 : left 2 : centred 3 : right	EN	1,1
text offset mm			IN	1,1
text type		1 : name 2 : light characteristic	EN	0,1 †
scale minimum	(SCAMIN)	See clause 2.5.9	IN	0,1

† Only one of the attributes **text** or **text type** must be populated for each instance of **Text Placement**.

INT 1 Reference:

23.1.1 Text placement

[**NOTE:** This modelling for the **Text Placement** cartographic feature is intended for implementation and testing purposes only. Complete implementation of this modelling is dependant on pending amendments to S-100 Part 9 to be included in S-100 Edition 5.0.0.]

If it is required to place text on an ENC to improve clarity of display, it must be done using the cartographic feature **Text Placement**. The **Text Placement** feature must be associated with the relevant geo feature using the composition **Text Association** (see clause 25.16).

NOTE: Where an associated instance of **Text Placement** has not been related to a feature having the attribute **name** and/or the attributes associated with the characteristics of a light populated, the text will be positioned in the ECDIS display in accordance with the default position for text strings defined in the Portrayal Catalogue.

Remarks:
- The **Text Placement** cartographic feature is used by the ECDIS to optionally position text in ECDIS, which has been populated using an attribute(s) for the associated feature. The attribute[s] is identified by populating the attribute **text type**. Alternatively, the text to be displayed may be encoded using the attribute **text**.
- The attributes **orientation value** and **text offset mm** define the bearing (related to true north) and distance of the anchor point of the text to be displayed from the associated feature. The values populated for these attributes must be determined based on the desired position of the text at the maximum display scale of the ENC data.
- **Text Placement** should only be associated with features of type point, and used in areas where it is important that text clear navigationally relevant areas, for example shipping channels and dredged areas.
- The attribute **scale minimum** may be used to determine a scale at which the text string is no longer visible.

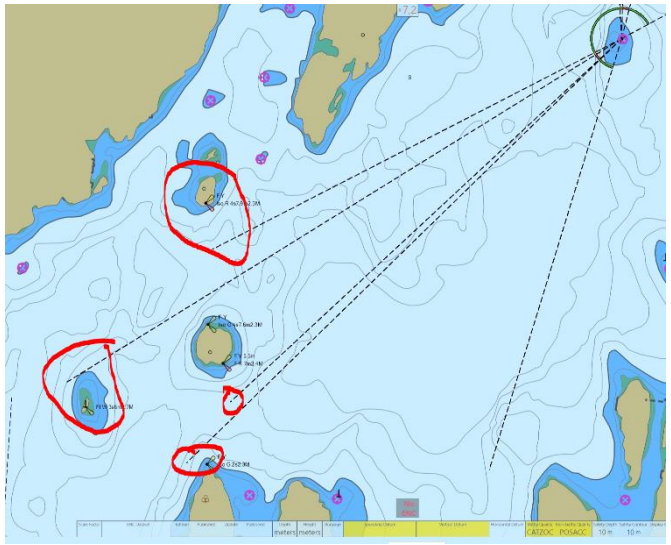
Markup Ar

Jeff Wootton Deleted: flip bearing
Jeff Wootton Deleted: 0
Jeff Wootton Deleted: Text
Jeff Wootton Deleted: TE
Jeff Wootton Deleted: 0
Jeff Wootton Deleted: †
Jeff Wootton Deleted: the associated
Jeff Wootton Deleted: related
Jeff Wootton Deleted: This
Teh Stand Deleted: <#>Only one of the attributes **text** or **text type** allowable for each instance of **Text Placement**.¶
Jeff Wootton Formatted: Indent: Left: 0 cm, Hanging: 0,42 cm, Sp After: 0 pt
Teh Stand Deleted: March
Teh Stand Formatted: Font color: Red
Teh Stand Deleted: 2021
Teh Stand Deleted: 1

ACTIONS FROM PORTRAYAL SUB-GROUP: SECTOR LINE LENGTH

International Hydrographic Organization

Portrayal Sub-Group: It was agreed that the further guidance was required in the DCEG in regard to the implementation of the sectorLineLength attribute. The current version of the DCEG (1.0.1) appears to be contradictory in regard to the intent of this attribute – there is guidance on using the attribute to reduce clutter when full sectors are displayed but also guidance on using the attribute to highlight critical light sectors when default light sectors are displayed.



light sector			(S) C	1,*
colour	(COLOUR)	1 : white 3 : red 4 : green 5 : blue 6 : yellow 9 : amber 10 : violet 11 : orange	(S) EN	1,* (ordered)
directional character			(S) C	0,1 †
moiré effect			(S) BO	0,1
orientation			(S) C	1,1
orientation uncertainty			(S) RE	0,1
orientation value	*(ORIENT)*		(S) RE	1,1
light visibility	(LITVIS)	1 : high intensity 2 : low intensity 3 : faint 4 : intensified 5 : unintensified 6 : visibility deliberately restricted 8 : partially obscured 9 : visible in line of range	(S) EN	0,*
sector limit			(S) C	0,1 †
sector limit one	*(SECTR1)*	sector limit one ≠ sector limit two *(0 = 360)*	(S) RE	1,1
sector limit two	*(SECTR2)*	sector limit two ≠ sector limit one; *(0 = 360)*	(S) RE	1,1
sector line length			(S) RE	0,1
value of nominal range	(VALNMR)		(S) RE	0,1
sector information			(S) C	0,*
language		ISO 639-2/T	(S) TE	0,1
text	*(INFORM)*		(S) TE	1,1

Teh Stand Deleted: C

Teh Stand Deleted: sector bearing

Teh Stand Deleted: C

Teh Stand Deleted: sector bearing

Teh Stand Deleted: March

Teh Stand Formatted: Font color: Red

Teh Stand Deleted: 2021

Teh Stand Deleted: 1

- The sub-attribute **sector line length** (see clause 27.151) may be used for critical light sectors to extend the sector line and the sector arc radius when the ECDIS display settings are set to display default sector lines and arcs. The intended usage of the ENC dataset must be considered when determining the usage of **sector line length** so as to avoid excessive screen clutter when default sector display is enabled; and consistent display of light sectors across the entire ENC portfolio should also be a consideration when determining the population of this attribute. Where populated, the value of **sector line length** must not exceed the value populated for the sub-attribute **value of nominal range** for the light sector.
- In some cases the area defined by the intersecting sectors of two discrete sector lights are used to indicate the existence of isolated and sometimes substantial dangers to navigation, the precise position of which may not be known. When default sectors are displayed in ECDIS, the extent and intent of these sectors may not be clearly defined to the mariner. In order to more clearly indicate these areas, compilers should consider appropriate use of **sector line length** for the relevant sectors in the impacted area. Where it is considered important that the area of possible danger is defined, this should be done by encoding a **Caution Area** feature (see clause 16.10) covering the intersection area. Information relating to the definition of the area by sector lights and a précis of the danger should be encoded using the complex attribute **information** (see clause 2.4.6) for the **Caution Area**.
- The fairway defined by the succession of navigable areas in the white sectors of a series of **Light Sectored** features may be encoded using the feature **Fairway** (see clause 15.7).
- If there is additional information required to be encoded that is relevant to all sectors of the light, this must be done using the **information** (see clause 2.4.6). If the additional information is relevant to individual sectors of the light only (for example, for complex (oscillating) light sectors (see clause 19.3.1.3 below)), this must be encoded using the complex sub-attribute **sector information** for the sub-complex attribute **light sector**.
- If it is required to encode details of the lighting technology (for example neon), it must be done using the complex attribute **information**.
- The attribute **vertical datum** applies only to **height**; this value must only be encoded if it is different from the value encoded in the "Datum Name" [DTNM] and "Datum Identifier" [DTID] subfields of the VDAT field of the "Coordinate Reference System" record where the "Axis Type" [AXTY] subfield of the "Coordinate System Axes" [CSAX] of the "Dataset Coordinate Reference System" record is set to *11* (Gravity Related Height), or

Jeff Wootton Delete
Jeff Wootton Delete
Jeff Wootton Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Forma
Teh Stand Delete
Teh Stand Forma
Teh Stand Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Delete
Teh Stand Forma
Teh Stand Delete

ACTIONS FROM PORTRAYAL SUB-GROUP: DISTANCE MARK

International Hydrographic Organization

Portrayal Sub-Group: It was suggested that where a distance mark exists as a physical mark, it should be encoded as an aid to navigation equipment feature associated to a structure feature. It was further suggested that if this modelling is implemented, further investigation should be carried out for remodelling the categoryOfDistanceMark as a Boolean type attribute.

27.88 distance mark visible

Distance mark visible: IHO Definition: A statement indicating whether a distance mark is visible or not.

Attribute Type: Boolean

Indication: A True value is an indication that the distance mark is visible.

Remarks:
- A **Distance Mark** feature having attribute **distance mark visible** = *True* is required to be associated to a structure feature using the feature association **Structure/Equipment** (see clause 25.15).

8.9 Distance mark

IHO Definition: **DISTANCE MARK**. A distance mark indicates the distance measured from an origin and consists of either a solid visible structure or a distinct location without special installation. Usually found on canals. (S-57 Edition 3.1, Appendix A – Chapter 1, Page 1.55, November 2000).

S-101 Geo Feature: **Distance Mark (DISMAR)**

Primitives: **Point**

Real World	*Paper Chart Symbol*	*ECDIS Symbol*

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
distance mark visible	*(CATDIS)*		BO	0,1
feature name			C	0,*
display name			(S) BO	0,1
language		ISO 639-2/T	(S) TE	0,1
name	*(OBJNAM)* *(NOBJNM)*		(S) TE	1,1
fixed date range		See clause 2.4.8	C	0,1
date end	(DATEND)		(S) TD	0,1
date start	(DATSTA)		(S) TD	0,1
measured distance value	*(INFORM)* *(NINFOM)*		C	1,1
distance unit of measurement		1 : metres 2 : yards 3 : kilometres 4 : statute miles 5: nautical miles	(S) EN	1,1

Remarks:
- The origin from which the distance has been measured is indicated using the sub-attribute **reference location**.
- Where an encoded distance mark has the Boolean type attribute **distance mark visible** populated as *True*, the **Distance Mark** must be associated to the structure supporting the mark using a **Structure/Equipment** feature association (see clause 25.15). If the nature of the structure is unknown, it should be encoded as a **Beacon Special Purpose/General** feature (see clause 20.12) or **Daymark** feature (see clause 20.13), with attribute **category of special purpose mark** = *17* (measured distance mark).
- For encoding a measured distance between two transits of marks established on the shore, see clause 15.4.2.

Distinction: Beacon Special Purpose/General.

Feature/Feature associations: Structure/Equipment: Updated Information; Text Association

Feature/Information associations: Additional Information

Spatial/Information association: Spatial Association

Jeff Wootton
Deleted: 1 : distance mark not physically installed¶
2 : visible mark, pole¶
3 : visible mark, board¶
4 : visible mark, unknown shape

Jeff Wootton
Deleted: category of distance mark

Jeff Wootton
Formatted: Font: Italic

Jeff Wootton
Deleted: EN

Teh Stand
Deleted: ISO 8601: 2004

Teh Stand
Deleted: ISO 8601: 2004

Teh Stand
Deleted: the structure

ACTIONS FROM PORTRAYAL SUB-GROUP: CURRENT NON-GRAVITATIONAL

International Hydrographic Organization

Portrayal Sub-Group: It was suggested that the geometric primitives curve and surface are removed as allowable geometries for the feature CurrentNonGravitational. The S-111 Surface Currents Product Specification should be used to encode areas of surface currents; and a use case is required for retention of the curve primitive.

GEO FEATURES

Administration Area			S		Airport/Airfield	P		S	
Anchor Berth	P		S		Anchorage Area	P		S	
Archipelagic Sea Lane				N	Archipelagic Sea Lane Area			S	
Archipelagic Sea Lane Axis		C			Beacon Cardinal	P			
Beacon Isolated Danger	P				Beacon Lateral	P			
Beacon Safe Water	P				Beacon Special Purpose/General	P			
Berth	P	C	S		Bridge		C	S	N
Building	P		S		Built-up Area	P		S	
Buoy Cardinal	P				Buoy Installation	P			
Buoy Isolated Danger	P				Buoy Lateral	P			
Buoy New Danger Marking	P				Buoy Safe Water	P			
Buoy Special Purpose/General	P				Cable Area			S	
Cable Overhead		C			Cable Submarine		C		
Canal		C	S		Cargo Transhipment Area	P		S	
Causeway		C	S		Caution Area	P		S	
Checkpoint	P		S		Coast Guard Station	P		S	
Coastline		C			Collision Regulations Limit		C		
Contiguous Zone			S		Continental Shelf Area			S	
Conveyor		C	S		Crane	P	C	S	
Current – Non-Gravitational	P				Custom Zone			S	
Dam		C	S		Daymark	P			

Teh Stand
Deleted: gravitational

Teh Stand
Deleted: C

10.3 Current – non-gravitational

IHO Definition: **CURRENT – NON-GRAVITATIONAL**. Any current that is caused by other than tide producing forces. Also called non-tidal current. (IHO Dictionary – S-32).

S-101 Geo Feature: Current – Non-Gravitational (CURENT)

Primitives: Point

Real World	*Paper Chart Symbol*	*ECDIS Symbol*

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
feature name			C	0,*

Markup A

Teh Stand
Deleted: , Curve, Surface

ACTIONS FROM PORTRAYAL SUB-GROUP: MANGROVES

International Hydrographic Organization

Portrayal Sub-Group: Taking into consideration issues related to portrayal and ECDIS performance (including Viewing Groups, alarms/indications), it was suggested that the encoding of mangroves in the intertidal area is remodelled to have mangrove included as a new value for categoryOfObstruction.

13.6.1.1 Mangroves (see S-4 – B-312.4)

Where the source indicates that a mangrove area is in the intertidal area, an **Obstruction** feature of type area, with attribute **category of obstruction** = *23* (mangrove) should be encoded on top of the portion of the intertidal area (**Depth Area** with attributes **depth range minimum value** = *-H* and **depth range maximum value** = *0* – see clause 11.7.3) where the mangrove coverage exists. The seaward spatial type(s) of the mangrove area should be associated to an instance of the information type **Spatial Quality** (see clause 24.5) having the attribute **quality of horizontal measurement** = *4* (approximate). The landward edge of the mangrove area representing the high water line should be encoded as **Coastline** (see clause 5.3), having no value populated for the attribute **category of coastline**, and no value for **quality of horizontal measurement** on the related spatial type(s).

If it is required to encode an individual mangrove tree within the intertidal area, this must be done using an **Obstruction** feature of type point, with attribute **category of obstruction** = *23* (mangrove).

Where mangrove areas are required to be generalised on smaller maximum display scale ENC datasets such that the seaward edge of the mangrove only is to be indicated as the "apparent" coastline, this must be done using the feature **Coastline** (see clause 5.3).

Distinction: Depth Area; Fishing Facility; Foul Ground; Marine Farm/Culture; Underwater/awash Rock; Water Turbulence; Wreck.

27.39 category of obstruction (CATOBS)

Category of obstruction: IHO Definition: Classification of objects that impede movement.

Attribute Type: Enumeration

1) **snag/stump**

   IHO Definition: A tree, branch or broken pile embedded in the ocean floor, river or lake bottom and not visible on the surface, forming thereby a hazard to vessels. (IHO Dictionary – S-32).

2) **wellhead**

⋮

22) **shark net**

   IHO Definition: A submerged net placed around beaches to reduce shark attacks on swimmers. (Wikipedia).

23) **mangrove**

   IHO Definition: One of several genera of tropical trees or shrubs which produce many prop roots and grow along low-lying coasts into shallow water. (IHO Dictionary – S-32).

Remarks:
- No remarks.

27.66 category of vegetation (CATVEG)

Category of land vegetation: IHO Definition: Classification of the plant life of an area or region.

Attribute Type: Enumeration

3) **bush**

   IHO Definition: A shrub or clump of shrubs with stems of moderate length. (The Concise Oxford Dictionary).

4) **deciduous wood**

   IHO Definition: A wood with trees that shed their leaves annually. (Bundesamt für Seeschifffahrt und Hydrographie, Germany).

5) **coniferous wood**

   IHO Definition: A wood with evergreen trees of a group usually bearing cones, including yews, cedars and redwoods. (Bundesamt für Seeschifffahrt und Hydrographie, Germany).

6) **wood in general (inc mixed wood)**

   IHO Definition: Growing trees densely occupying a tract of land. (The Concise Oxford Dictionary).

11) **reed**

5.12.1 Vegetation (see S-4 – B-312.4; B-352.4 and B-354)

In most areas the vegetation cover is of negligible importance on charts with the exception of:
- Areas where trees or marsh form the apparent coastline; see S-4 – B-312;
- Isolated trees or clumps of trees forming landmarks;
- Where, near the coast, wooded areas alternate with areas without tree cover and so may assist in identifying headlands or other stretches of coastline.

The following features should be omitted from even the largest maximum display scale ENC data:
- Grassland, cultivated fields (including paddy fields), bushes.
- Trees along roads, fences, ditches, and scattered trees (unless landmarks).
- Woodland cover within urban areas (unless adjacent to the coast).
- Woodland cover which is the general ground cover and therefore useless for identification of position.

If it is required to encode an isolated tree used as a landmark, it must be done using a **Vegetation** feature, with attribute **category of vegetation** = *13* to *22*.

Remarks:
- The attribute **height** is used to encode the approximate altitude of the highest point of the top of the vegetation. Where the source shows an island with the approximate height of the top of the vegetation above height datum (see INT1 - C14), a **Vegetation** feature should be encoded co-incident with the **Land Area** feature of the island, with attribute **height** corresponding to the value shown on the source.
- Where it is required to encode a mangrove area or tree located in the intertidal area, this must be done using the feature **Obstruction** (see clauses 13.6 and 13.6.1.1), with attribute **category of obstruction** = *23* (mangrove). Where it is required to encode the generalised seaward edge only of a mangrove area to represent the "apparent" coastline only, this must be done using the feature **Coastline** (see clsue 5.3).

Distinction: Seabed Area; Seagrass; Weed/Kelp.

Feature/Feature associations: Updated Information; Text Association
Feature/Information associations: Additional Information
Spatial/Information association: Spatial Association

Jeff Wootton
Deleted: <#>mangroves¶
IHO Definition: One of several genera
shrubs which produce many prop roots
lying coasts into shallow water. (IHO D

S-101PT8 Meeting 06-07 December 2021

ACTIONS FROM PORTRAYAL SUB-GROUP: SOUNDING GROUPS

International Hydrographic Organization

Portrayal Sub-Group: Also taking into account discussions in the DCEG Sub-Group and the ENCWG, additional guidance is required in the DCEG in regard to the grouping of soundings; particularly in relation to ENC Updates.

31 Updating (see S-4 – B-600)

Remarks:

- An ENC Update will be rejected by the ECDIS if it is located outside the area of data coverage for the dataset (that is, area covered by the meta feature **Data Coverage** with attribute **category of coverage** = *1* (coverage available)) or if it changes the extent of this area. Where the area of data coverage for a base ENC dataset is to be changed, this must be done by issuing a New Edition of the dataset.
- It has been reported that some ECDIS experience problems in loading large Update datasets. Therefore, as a guide, ENC Updates should not exceed 50 Kilobytes in size.
- It has been reported that grouping new or modified soundings into existing sounding groups (see clause 11.3) in an ENC Update negatively impacts the discovery of the changes to the bathymetry by mariners. Therefore, encoders are advised that soundings added or modified as part of an ENC Update should be encoded as individual sounding objects or, if in close proximity, may be included as a single grouped sounding object. When a New Edition of the ENC is produced, soundings may be re-grouped in accordance with the Data Producer's standard practices.
- When updating the geometry of curve features, compilers must note S-101 clause X.X regarding the requirement for the vector records making up the curve feature to be referenced sequentially. Additionally, for curve features comprising multiple edges, the end node of a vector record must be the same as the start node of the following vector record. It has been reported that some ECDIS reject ENC Updates where the geometry does not conform to these requirements.

11.3.1 Soundings (see S-4 – B-412 and B-413.1)

A sounding associated with a rock or coral pinnacle which is an obstruction to navigation must be encoded using the feature **Underwater/Awash Rock** (INT1 – K14, see clause 13.4) with attribute **value of sounding** populated with the value of the sounding.

The geometry of soundings and no bottom found depths (see clause 11.8) is held in a 3 dimensional array (latitude, longitude, depth). In the interests of efficiency, multiple soundings should be encoded in one spatial type (known as "grouping" of soundings), provided that all the spatial and geo feature attributes are common to the group.

As the sounding multiplication factor (CMFZ) for ENC is 100, soundings may be encoded to two decimal places of a metre. Drying soundings must be indicated by a negative value.

For soundings surrounded by a danger line, see clauses 13.1 and 13.2.

Population of the attributes **quality of vertical measurement**, **source date** and the spatial attribute **quality of horizontal measurement** are described in the Table below:

⋮

- For all **Sounding** features of depth 30 metres or less, an instance of the information type **Spatial Quality** (see clause 25.4) must be associated to the sounding geometry, using the association **Spatial Association**. See also clause 3.7.1.3 (**Quality of Bathymetric Data**).
- The attribute **display uncertainties** is a cartographic attribute intended to reduce screen clutter in some ECDIS display settings by limiting the display of the horizontal position accuracies of a sounding to those considered by the encoder to be important to the mariner, and is mandatory for all **Sounding** of depth 30 metres or less. Factors to be considered in populating this attribute include depth in relation to the general nature of the seabed, proximity to other dangers, intention of the ENC, proximity to routes taken by vessels, and the types of vessels intended to utilise the ENC.
- Encoders must exercise caution when using the option to group soundings; particularly where they are included in an ENC Update as this may impact negatively on ECDIS performance regarding mariner interrogation of Updates. When grouping soundings in an ENC dataset, creation of excessively large sounding groups should be avoided so as to reduce the impact when a sounding is to be removed by ENC Update; and new soundings to be added by ENC Update should not be added to already existing sounding groups.
- For depths indicated as no bottom found, see clause 11.8.

Distinction: Depth Area; Depth – No Bottom Found; Obstruction; Underwater/Awash Rock; Wreck.

OUTSTANDING ACTIONS FROM PORTRAYAL SUB-GROUP

International Hydrographic Organization

- Non-Display Encoding Combinations: Consider removing from the DCEG. Possibly to be informed via mariner survey.
- Masking: Remove examples no longer required and add new examples.

STRUCTURE OF ASSOCIATIONS TABLES

International Hydrographic Organization

25.2 Aids to navigation association

Aids to Navigation Association: IHO Definition: A feature association for the binding between navigational aids and the traffic systems (such as routeing measures) that they define.

Remarks:

- The features comprising an **Aids to Navigation Association** must include at least one of any of the features included in the "Consists of" role associated to one or more of the corresponding features in the "Component of" role.

Role Type	Role	Associated With	Multiplicity
Association	Component of	**Archipelagic Sea Lane**, **Deep Water Route**, **Fairway System**, **Traffic Separation Scheme**, **Two-Way Route**	0,1
	Consists of	**Beacon Cardinal**, **Beacon Isolated Danger**, **Beacon Lateral**, **Beacon Safe Water**, **Beacon Special Purpose/General**, **Buoy Cardinal**, **Buoy Isolated Danger**, **Buoy Lateral**, **Buoy New Danger Marking**, **Buoy Safe Water**, **Buoy Special Purpose/General**, **Daymark**, **Light Float**, **Light Vessel**, **Pile**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Association	Component of	**Deep Water Route**, **Fairway System**, **Traffic Separation Scheme**, **Two-Way Route**	0,1
	Consists of	**Building**, **Crane**, **Fishing Facility**, **Fortified Structure**, **Landmark**, **Mooring/Warping Facility**, **Offshore Platform**, **Silo/Tank**, **Wind Turbine**	0,* {1,* [C]}
Role Type	**Role**	**Associated With**	**Multiplicity**
Association	Component of	**Fairway System**, **Traffic Separation Scheme**, **Two-Way Route**	0,1
	Consists of	**Bridge**, **Conveyor**, **Floating Dock**, **Hulk**, **Pipeline Overhead**, **Pontoon**, **Pylon/Bridge Support**, **Shoreline Construction**, **Span Fixed**, **Span Opening**	0,* {1,* [C]}

OTHER SIGNIFICANT CHANGES

- Mandatory and Conditional Attributes: New annotation included in Table 2.3 to provide an indication of mandatory attributes that should not be populated with an empty (null) value [Request from SHOM.]

2.4.3 Mandatory and conditional attributes

Some attributes are mandatory and must be populated for a given feature type. The following are reasons why attribute values may be considered mandatory:

- They are required to support correct portrayal by determining
  - whether a feature is in the display base
  - which symbol is to be displayed;
- Certain features make no logical sense without specific attributes. In Table 2.3 below, mandatory attributes for which this is relevant for a feature (that is, the attribute should not be populated with an empty (null) value) are indicated by the superscript *; and
- Some attributes are required for safety of navigation.

Feature	Mandatory Attributes
GEO FEATURES	
Administration Area	jurisdiction
Archipelagic Sea Lane Area	nationality *
Archipelagic Sea Lane Axis	nationality *

- Quality of Bathymetric Data: Guidance at clause 3 amended to make QualityOfBathymetricData features optional at scales of 1:700000 and smaller rather than mandatory if there is no larger scale coverage available [Discussions in S-57 to S-101 Conversion Sub-Group.]

Quality of Bathymetric Data: The meta feature **Quality of Bathymetric Data** defines areas within which uniform assessment exists for the quality of bathymetric data, and is used to provide an assessment of the overall quality of bathymetric data to the mariner. Areas of a dataset at maximum display scale 1:700000 and larger containing depth data or bathymetry must be covered by one or more **Quality of Bathymetric Data** features, which may overlap vertically (see clause 3.7.1). At maximum display scales smaller than 1:700000, **Quality of Bathymetric Data** features are optional.

Teh Stand
Deleted: must be encoded where no larger maximum display scale ENC data is available

OTHER SIGNIFICANT CHANGES (2)

- Update Information: New guidance added to clause 3.11.1, Remarks 3rd bullet, for handling old/outdated **Update Information** features [Review comment from Raphael.]

> • At each new edition of an ENC cell **Update Information** features which are no longer relevant must be deleted; and for the next Update to an ENC cell **Update Information** features included in the previous Update dataset should be considered for deletion. Where a new Update impacts a feature that has previously been updated, any existing instance of **Update Information** associated to the feature must be deleted as part of the new Update; this may be done by deleting the existing **Update Information** from the dataset, or by removing the impacted feature(s) from the association **Updated Information** if there are features included in the association that are not impacted by the new Update.

- Bridges: Added new guidance in first paragraph of clause 6.5.1 that bridges encoded with point geometry are to be encoded as **Landmark** features. [IHO Sec review comment.]

> **6.5.1 Bridges (see S4 – B-381)**
>
> If it is required to encode a bridge, it should be done using the feature **Bridge**. Bridges may be encoded over water that is navigable or non-navigable at the maximum display scale of the ENC data. Where the bridge is encoded over navigable water, the spans and pylons of the bridge must be associated with the feature **Bridge** using the association **Bridge Aggregation** (see clause 25.4) (that is, the **Bridge** feature has no geometry, but inherits the geometry of the component features). Where the bridge is encoded over non-navigable water, then it must be encoded, where required, using a **Bridge** feature having no component features (that is, the **Bridge** feature has geometry of type curve or surface); or as a **Landmark** feature (see clause 7.2) if the bridge has geometry of type point.

- Landmarks: Added new values for attribute categoryOfLandmark of 26 (bridge) and 27 (dam) and associated guidance at clause 7.2.1 [IHO Sec review comment.]

> • Values **category of landmark** = 26 (bridge) and 27 (dam) must only be used if the feature is encoded using point geometry; and must not be encoded over navigable water. Bridges and dams encoded using curve or surface geometry must be encoded using features **Bridge** (see clause 6.5) and **Dam** (see clause 8.11) respectively.

OTHER SIGNIFICANT CHANGES (3)

- categoryOfProductionArea: Added new value for attribute **category of production area** of *12* (solar farm). [Review comment from AU.]

12) **solar farm**

IHO Definition: A large-scale photovoltaic system (PV system) designed for the supply of merchant power into the electricity grid. They are differentiated from most building-mounted and other decentralised solar power applications because they supply power at the utility level, rather than to a local user or users. The generic expression utility-scale solar is sometimes used to describe this type of project. (Wikipedia).

- Date dependency – docks and locks: Amended guidance point to include an example of the text string that may be encoded to indicate date dependancy of **Dock Area** and **Lock Basin** features. [S-57 to S-101 Conversion Sub-Group discussion.]

lock must be encoded using appropriate features such as **Coastline**, **Shoreline Construction** or **Gate**. The lock must not be encoded as **Lock Basin**. If it is required to encode the name of the lock, it must be done using the feature **Sea Area/Named Water Area**.

- It if is required to encode a lock that is not navigable at the maximum display scale of the ENC data, it must be done using **Lock Basin**. The name of the lock should be encoded using the complex attribute **feature name** on the **Lock Basin** feature.
- **Lock Basin** are part of the Skin of the Earth.
- If an encoded **Lock Basin** has a date dependency, this should be indicated using the complex attribute **information** (see clause 2.4.6). For example, sub-attribute **text** = *Start date: 01 April; End date: 15 October.*
- The gates should be encoded as a **Gate** feature (see clause 8.10) with attribute **category of gate** = *4* (lock gate) or *3* (caisson). For smaller maximum display scale ENC data, a lock may be encoded using **Gate** only, without using **Lock Basin**.

Distinction: Canal; Gate.

Teh Stand July 30, 2021
Deleted: an an associated instance of

Teh Stand
Deleted: information type **Nautical Information**,

Teh Stand
Deleted: 24.4

IHO OTHER SIGNIFICANT CHANGES (4)

International Hydrographic Organization

- Vertical length of floating obstructions: Add new guidance on population of obstructions having attribute **water level effect** = *7* (floating). Amended guidance for population of attribute vertical length to include floating obstructions. [Review comment from IHO Sec.]

- The attribute **height** must be populated for **Obstruction** features having attribute **water level effect** = *1* (partly submerged at high water) or *2* (always dry).
- **Obstruction features having attribute water level effect = *7* (floating) must have the attribute height populated with an empty (null) value.**
- The attribute **vertical length** is used to populate the distance of an obstruction above the seabed; or the height of a floating obstruction above the sea surface.

Teh Stand
Deleted: the

- Foul ground: Removed attribute **water level effect** as an allowable attribute for the feature **Foul Ground**. [S-57 to S-101 Conversion Guidance document preparation.]

13.7 Foul ground

IHO Definition: **FOUL GROUND**. Areas over which it is safe to navigate but which should be avoided for anchoring, taking the ground or ground fishing. (IHO Dictionary – S-32).

⋮

uncertainty fixed	*(SOUACC)*		(S) RE	1,1
uncertainty variable factor			(S) RE	0.1
scale minimum	(SCAMIN)	See clause 2.5.9	IN	0,1

Teh Stand
Deleted: water level effect

IHO OTHER SIGNIFICANT CHANGES (5)

International Hydrographic Organization

- Fishing facilities considered to be an obstruction to navigation: Added new guidance on also encoding Fishing Facility that may also be considered to be a danger to navigation as **Obstruction** features. [S-57 to S-101 Conversion Guidance document preparation.]

13.9.1 Fishing facilities (see S-4 – B-447 and B-447.1-3)

Fishing facilities are usually sited in shallow water, but tunny nets are often located in deeper water. They can be very large and extend up to several miles offshore; and form an obstruction to navigation.

If it is required to encode a fishing facility it must be done using the feature **Fishing Facility**.

Remarks:

- The attribute **vertical length** is used to populate the distance of the facility above the seabed.
- Certain types of fishing facilities such as tunny nets in deep water may be an obstruction to navigation. If **Fishing Facility** features are considered to be an obstruction or hazard to navigation, they should also be encoded with an **Obstruction** feature (see clause 13.6). Although this is contrary to ENC encoding principles (that is, double encoding), this solution is recommended for portraying dangers to navigation of this nature in the ECDIS.

- Marine farms: Added missing attribute **height** as an allowable attribute for the feature **Marine Farm/Culture**. [S-57 to S-101 Conversion Guidance document preparation.]

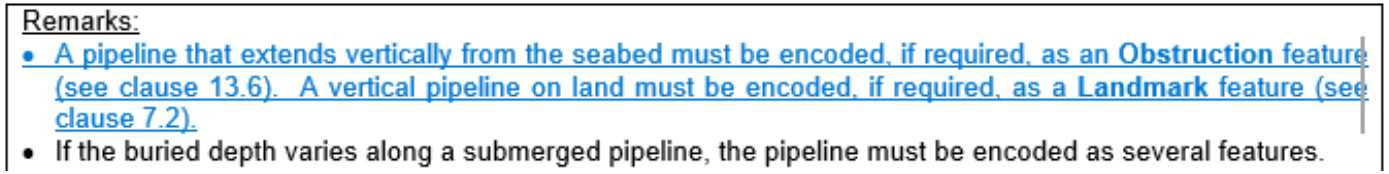
13.10 Marine farm/culture

IHO Definition: **MARINE FARM/CULTURE**. An assemblage of cages, nets, rafts and floats or posts where fish, including shellfish, are artificially cultivated. Also called fish farm. (IHO Dictionary – S-32).

fixed date range		See clause 2.4.8	C	0,1
date end	(DATEND)		(S) TD	0,1 †
date start	(DATSTA)		(S) TD	0,1 †
height	(HEIGHT)		RE	0,1 †
periodic date range		See clause 2.4.8	C	0,*

OTHER SIGNIFICANT CHANGES (6)

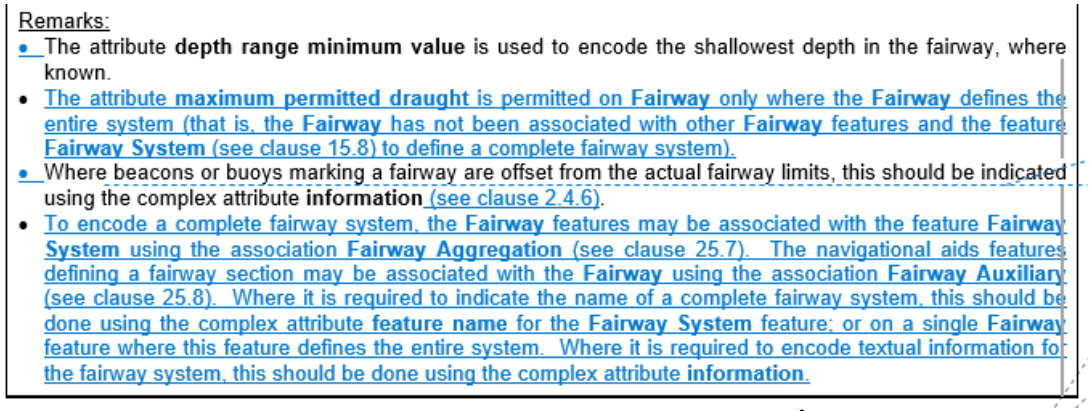
- Marine farms: Added attributes **default cvlearance depth** and **surrounding depth** as allowable attributes for the feature **Marine Farm/Culture**. [Comment from Raphael during S-98 preparation.]
- Pipelines: Removed attribute **vertical length** as an allowable attribute for the feature **Pipeline Submarine/On Land**. Added new guidance for encoding vertical pipes. [S-57 to S-101 Conversion Guidance document preparation.]



Remarks:

- A pipeline that extends vertically from the seabed must be encoded, if required, as an **Obstruction** feature (see clause 13.6). A vertical pipeline on land must be encoded, if required, as a **Landmark** feature (see clause 7.2).
- If the buried depth varies along a submerged pipeline, the pipeline must be encoded as several features.

- Fairways: New guidance added for encoding of attribute **maximum permitted draught** and creating fairway associations. [S-101 Portrayal Sub-Group discussions.]



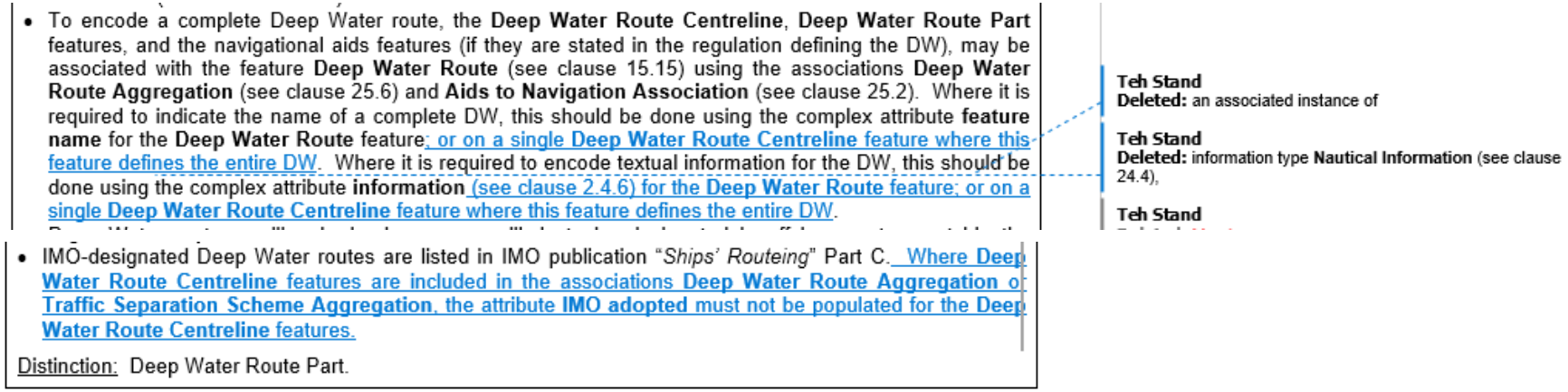
Remarks:

- The attribute **depth range minimum value** is used to encode the shallowest depth in the fairway, where known.
- The attribute **maximum permitted draught** is permitted on **Fairway** only where the **Fairway** defines the entire system (that is, the **Fairway** has not been associated with other **Fairway** features and the feature **Fairway System** (see clause 15.8) to define a complete fairway system).
- Where beacons or buoys marking a fairway are offset from the actual fairway limits, this should be indicated using the complex attribute **information** (see clause 2.4.6).
- To encode a complete fairway system, the **Fairway** features may be associated with the feature **Fairway System** using the association **Fairway Aggregation** (see clause 25.7). The navigational aids features defining a fairway section may be associated with the **Fairway** using the association **Fairway Auxiliary** (see clause 25.8). Where it is required to indicate the name of a complete fairway system, this should be done using the complex attribute **feature name** for the **Fairway System** feature; or on a single **Fairway** feature where this feature defines the entire system. Where it is required to encode textual information for the fairway system, this should be done using the complex attribute **information**.

IHO OTHER SIGNIFICANT CHANGES (7)

International Hydrographic Organization

- Routeing measures: Clarifications for population of the names of routing measures and population of the attribute **IMO adopted**. [S-101 Portrayal Sub-Group discussions and S-57 to S-101 Conversion Guidance document preparation.]



- To encode a complete Deep Water route, the **Deep Water Route Centreline**, **Deep Water Route Part** features, and the navigational aids features (if they are stated in the regulation defining the DW), may be associated with the feature **Deep Water Route** (see clause 15.15) using the associations **Deep Water Route Aggregation** (see clause 25.6) and **Aids to Navigation Association** (see clause 25.2). Where it is required to indicate the name of a complete DW, this should be done using the complex attribute **feature name** for the **Deep Water Route** feature; or on a single **Deep Water Route Centreline** feature where this feature defines the entire DW. Where it is required to encode textual information for the DW, this should be done using the complex attribute **information** (see clause 2.4.6) for the **Deep Water Route** feature; or on a single **Deep Water Route Centreline** feature where this feature defines the entire DW.

Teh Stand
Deleted: an associated instance of

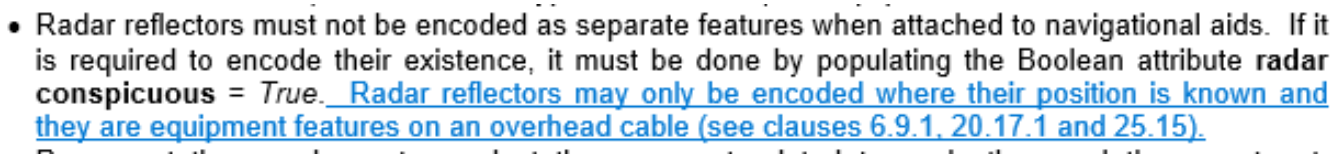
Teh Stand
Deleted: information type **Nautical Information** (see clause 24.4),

Teh Stand

- IMO-designated Deep Water routes are listed in IMO publication "*Ships' Routeing*" Part C. Where **Deep Water Route Centreline** features are included in the associations **Deep Water Route Aggregation** or **Traffic Separation Scheme Aggregation**, the attribute **IMO adopted** must not be populated for the **Deep Water Route Centreline** features.

Distinction: Deep Water Route Part.

- Radar reflectors: Clarified guidance for the encoding of the feature **Radar Reflector** on overhead cables. [Review comment from Raphael.]



- Radar reflectors must not be encoded as separate features when attached to navigational aids. If it is required to encode their existence, it must be done by populating the Boolean attribute **radar conspicuous** = *True*. Radar reflectors may only be encoded where their position is known and they are equipment features on an overhead cable (see clauses 6.9.1, 20.17.1 and 25.15).

OTHER SIGNIFICANT CHANGES (8)

- Elevation of lights on floating structures: Amended guidance (for consistency – clause 2.5.7) to populate the elevation of a light on a floating structure using attribute **vertical length** on the light feature. [Review comment from IHO Sec.]

If it is required to encode the elevation of a light on a fixed structure, it must be done using the attribute **height**.

If it is required to encode the height above the water surface of a light on a floating structure, it must be done using the attribute vertical length on the relevant light feature (see clause 2.5.7).

19.1.4 Times of exhibition and exhibition conditions (see S-4 – B-473)

19.1.4.1 Night lights

Teh Stand
Deleted: an associated instance of

Teh Stand
Deleted: information type **Nautical Information** (see clause 24.4), complex

Teh Stand
Deleted: information

- Lights: Added attribute **vertical length** as an allowable attribute for light features and associated guidance in accordance with amended guidance at clauses 2.5.7 and 19.1.3. [Review comment from IHO Sec.]

- The attribute **vertical length** only applies to lights attached to floating structures (see clause 2.5.7).
- The indication that a light is a "major" light through the population of the Boolean attribute **major light** with a

- AIS information: Added guidance for encoding AIS information in ENCs. [S-101 Conversion Guidance document preparation.]

It is not required to encode AIS information on ENCs, as ENCs are intended to be used in conjunction with ECDIS as part of an Integrated Navigation System (INS), in which AIS targets are displayed when in range. However, Producing Authorities may wish to indicate the presence of a physical or virtual AIS aid to navigation to aid in the route planning process or for use in ECS or other navigation systems.

OTHER SIGNIFICANT CHANGES (9)

- Nautical information: Multiplicity of attribute **information** on feature **Nautical Information** amended to [0..*] and guidance amended to require at least one of the attributes **information** or **pictorial representation** to be populated for **Nautical Information**. [Review comment from IHO Sec.]

24.4 Nautical information

IHO Definition: **NAUTICAL INFORMATION**. Nautical information about a related area or facility.				
S-101 Information Type: Nautical Information				
Primitives: None				
Real World	*Paper Chart Symbol*	*ECDIS Symbol*		
S-101 Attribute	**S-57 Acronym**	**Allowable Encoding Value**	**Type**	**Multiplicity**
fixed date range		See clause 2.4.8	C	0,1
date end	(DATEND)		(S) TD	0,1 †
date start	(DATSTA)		(S) TD	0,1 †
periodic date range		See clause 2.4.8	C	0,*
date end	*(PEREND)*		(S) TD	1,1
date start	*(PERSTA)*		(S) TD	1,1
information		See clause 2.4.6	C	0,* †
file locator			(S) TE	0,1
file reference	*(TXTDSC)* *(NTXTDS)*		(S) TE	0,1 †
headline			(S) TE	0,1
language		ISO 639-2/T	(S) TE	0,1
text	*(INFORM)* *(NINFOM)*		(S) TE	0,1 †
pictorial representation	(PICREP)	See clause 2.4.12.2	TE	0,1 †
† At least one of the attributes **information** or **pictorial representation** must be populated.				

IHO OTHER SIGNIFICANT CHANGES (10)

International Hydrographic Organization

- Shark nets: Added new enumerate value *22* (shark net) to attribute **category of obstruction**. [S-101PT5 action.]

21) **active submarine volcano**

IHO Definition: An active seabed volcano, which may be submerged or projecting above the water at the chart sounding datum. (Adapted from IHO Dictionary – S-32).

22) **shark net**

IHO Definition: A submerged net placed around beaches to reduce shark attacks on swimmers. (Wikipedia).

23) **mangrove**

IHO Definition: One of several genera of tropical trees or shrubs which produce many prop roots and grow along low-lying coasts into shallow water. (IHO Dictionary – S-32).

- Horizontal clearances: Amended definition for attribute **horizontal distance value** to be distinct from the attribute **horizontal clearance width**. [Review comment from 7Cs.]

27.104 horizontal clearance value (HORCLR)

Horizontal clearance value: IHO Definition: The physical horizontal clearance distance between two points on a feature, such as a bridge span, dock, gate, lock or tunnel.

Attribute Type: Real

Unit: Defined as an attribute in the ENC dataset metadata: metre (m)

Resolution: 0·1m

Format: xx.x

Deleted: width

Teh Stand
Deleted: of

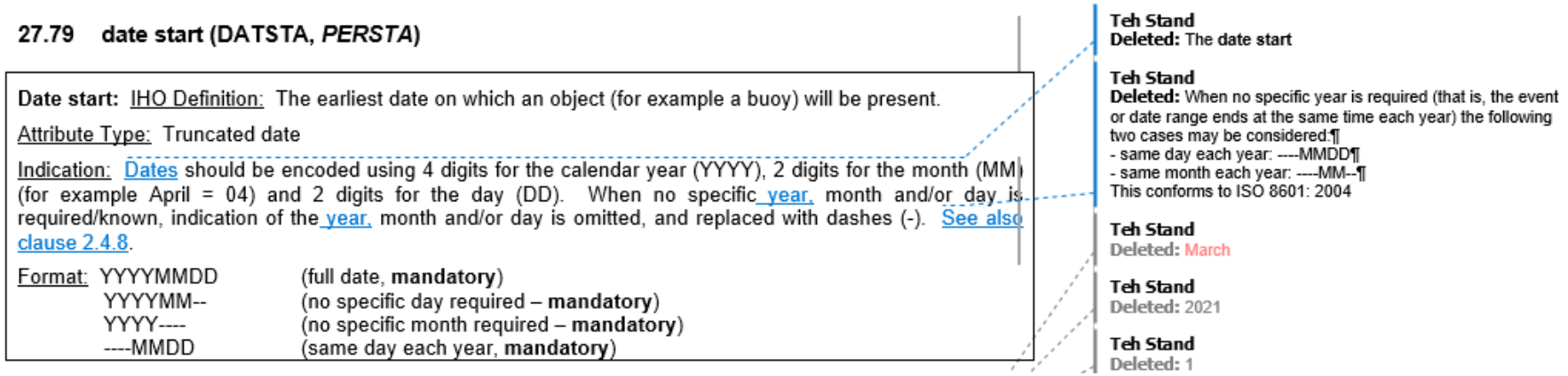
Teh Stand
Deleted: canal or a tunnel

Teh Stand
Deleted: , which is available for safe navigation. This may, or may not, be the same as the total physical width of the feature. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.137, November 2000).¶

IHO OTHER SIGNIFICANT CHANGES (11)

International Hydrographic Organization

- Dates: Indication for date attributes standardized throughout to be consistent for all Truncated Date type attributes and to reference clause 2.4.8 rather than ISO 8601:2004. [Review comment from Raphael.]



27.79 date start (DATSTA, *PERSTA*)

Date start: IHO Definition: The earliest date on which an object (for example a buoy) will be present.

Attribute Type: Truncated date

Indication: Dates should be encoded using 4 digits for the calendar year (YYYY), 2 digits for the month (MM) (for example April = 04) and 2 digits for the day (DD). When no specific year, month and/or day is required/known, indication of the year, month and/or day is omitted, and replaced with dashes (-). See also clause 2.4.8.

Format: YYYYMMDD (full date, **mandatory**)
YYYYMM-- (no specific day required – **mandatory**)
YYYY---- (no specific month required – **mandatory**)
----MMDD (same day each year, **mandatory**)

Teh Stand
Deleted: The date start

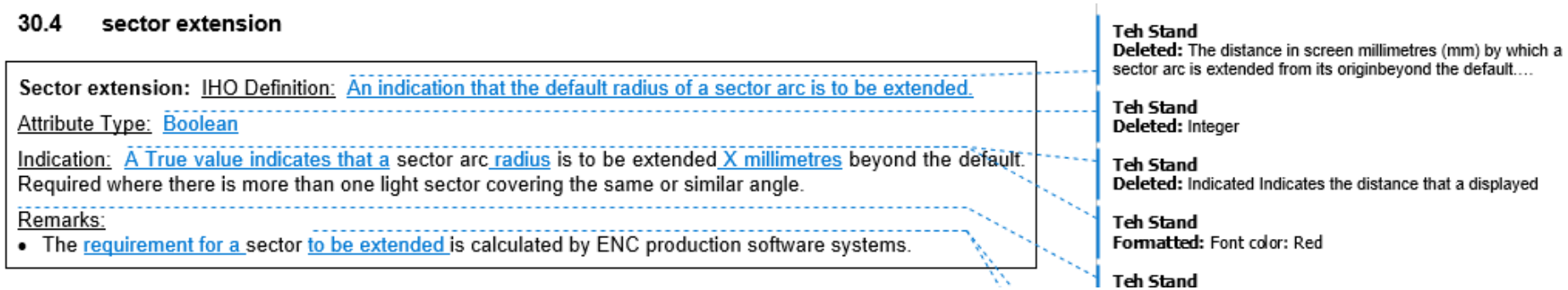
Teh Stand
Deleted: When no specific year is required (that is, the event or date range ends at the same time each year) the following two cases may be considered:¶
- same day each year: ----MMDD¶
- same month each year: ----MM--¶
This conforms to ISO 8601: 2004

Teh Stand
Deleted: March

Teh Stand
Deleted: 2021

Teh Stand
Deleted: 1

- Sector extension: Attribute type for **sector extension** amended to Boolean and guidance amended. [Actions from S-101PT4 and discussions at S-101PT7.]



30.4 sector extension

Sector extension: IHO Definition: An indication that the default radius of a sector arc is to be extended.

Attribute Type: Boolean

Indication: A True value indicates that a sector arc radius is to be extended X millimetres beyond the default. Required where there is more than one light sector covering the same or similar angle.

Remarks:
- The requirement for a sector to be extended is calculated by ENC production software systems.

Teh Stand
Deleted: The distance in screen millimetres (mm) by which a sector arc is extended from its originbeyond the default....

Teh Stand
Deleted: Integer

Teh Stand
Deleted: Indicated Indicates the distance that a displayed

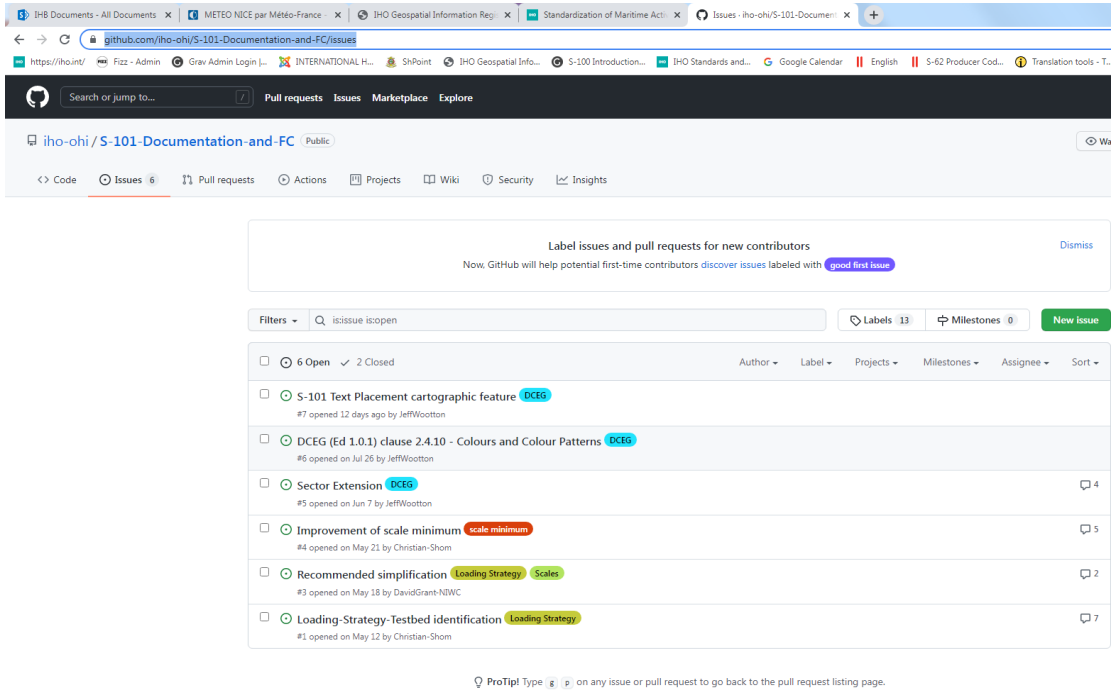
Teh Stand
Formatted: Font color: Red

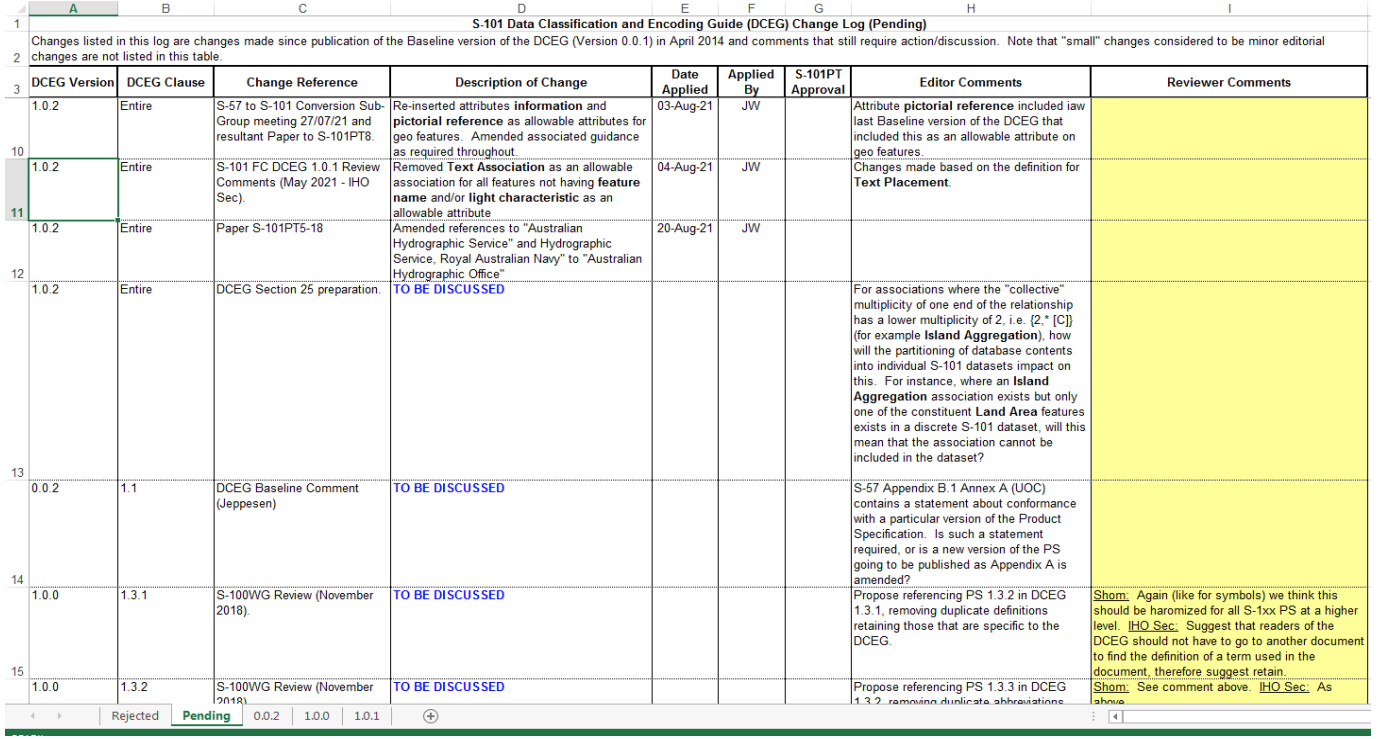
Teh Stand

GITHUB ISSUES

International Hydrographic Organization

- https://github.com/iho-ohi/S-101-Documentation-and-FC/issues
- New issues will be added (for example Portrayal related issues) as they are raised.
- Intention is to also migrate the outstanding comments in the “S-101 DCEG Post-Baseline Change Log” document as new issues for discussion as required.





S-101 Data Classification and Encoding Guide (DCEG) Change Log (Pending)

Changes listed in this log are changes made since publication of the Baseline version of the DCEG (Version 0.0.1) in April 2014 and comments that still require action/discussion. Note that "small" changes considered to be minor editorial changes are not listed in this table.

DCEG Version	DCEG Clause	Change Reference	Description of Change	Date Applied	Applied By	S-101PT Approval	Editor Comments	Reviewer Comments
1.0.2	Entire	S-57 to S-101 Conversion Sub-Group meeting 27/07/21 and resultant Paper to S-101PT8.	Re-inserted attributes **information** and **pictorial reference** as allowable attributes for geo features. Amended associated guidance as required throughout.	03-Aug-21	JW		Attribute **pictorial reference** included iaw last Baseline version of the DCEG that included this as an allowable attribute on geo features.	
1.0.2	Entire	S-101 FC DCEG 1.0.1 Review Comments (May 2021 - IHO Sec).	Removed **Text Association** as an allowable association for all features not having **feature name** and/or **light characteristic** as an allowable attribute	04-Aug-21	JW		Changes made based on the definition for **Text Placement**.	
1.0.2	Entire	Paper S-101PT5-18	Amended references to "Australian Hydrographic Service" and Hydrographic Service, Royal Australian Navy" to "Australian Hydrographic Office"	20-Aug-21	JW			
1.0.2	Entire	DCEG Section 25 preparation.	TO BE DISCUSSED				For associations where the "collective" multiplicity of one end of the relationship has a lower multiplicity of 2, i.e. {2,* [C]} (for example **Island Aggregation**), how will the partitioning of database contents into individual S-101 datasets impact on this. For instance, where an **Island Aggregation** association exists but only one of the constituent **Land Area** features exists in a discrete S-101 dataset, will this mean that the association cannot be included in the dataset?	
0.0.2	1.1	DCEG Baseline Comment (Jeppesen)	TO BE DISCUSSED				S-57 Appendix B.1 Annex A (UOC) contains a statement about conformance with a particular version of the Product Specification. Is such a statement required, or is a new version of the PS going to be published as Appendix A is amended?	
1.0.0	1.3.1	S-100WG Review (November 2018).	TO BE DISCUSSED				Propose referencing PS 1.3.2 in DCEG 1.3.1, removing duplicate definitions retaining those that are specific to the DCEG.	Shom: Again (like for symbols) we think this should be haromized for all S-1xx PS at a higher level. IHO Sec: Suggest that readers of the DCEG should not have to go to another document to find the definition of a term used in the document, therefore suggest retain.
1.0.0	1.3.2	S-100WG Review (November 2018)	TO BE DISCUSSED				Propose referencing PS 1.3.3 in DCEG 1.3.2, removing duplicate abbreviations	Shom: See comment above. IHO Sec: As above

Rejected | Pending | 0.0.2 | 1.0.0 | 1.0.1

ACTIONS REQUESTED OF S-101PT

- **Note** the changes applied in the draft S-101 DCEG Edition 1.2.0.
- **Approve** the publication of Edition 1.0.2 of the DCEG and subsequent development of Edition 1.0.2 of the S-101 Feature Catalogue.
- **Note** the issues posted in the “S-101 Documentation and FC” GitHub repository and provide comments on any of the issues raised as required..

IHO

International Hydrographic Organization

THANK YOU