S-101PT6 Remote Meeting

23-24 February 2021

S-101 DCEG Update

S-101 DCEG SUB-GROUP ACTIONS

IHO

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No.	Action	Detail	Lead	Status	Remarks
S-101PT5-04	Changes Intoduced in S-101 Edition 1.1.0 DCEG	PT members interested in participating in the S-101 DCEG Sub-Group to notify JW by email (jeff.wootton@iho.int) at the earliest opportunity.	S-101PT	Completed	
S-101PT5-05	Changes Intoduced in S-101 Edition 1.1.0 DCEG	Redline version of the S-101 DCEG to be sent to S-101 DCEG Sub-Group members for review (before end of September 2020).	JW	Completed	Email to Sub-Group 28/10/20.
S-101PT5-06	Changes Intoduced in S-101 Edition 1.1.0 DCEG	The definition as to what constitutes and “editorial” change to the S-101 DCEG is to be determined, in consultation with the S-101PT Executive (September 2020).	JW/Chair/Vice-Chair/YB	Completed	Email correspondence with S-101PT Executive 05-07/10/20.
S-101PT5-15	VALSOU Decimal Places	Paper S-101PT5-12 to be considered by the DCEG Sub-group (November 2020).	S-101 DCEG Sub-Group	In progress	Resolution amended to 0.01 metres for testing purposes.
S-101PT5-21	Compendium of AHO Proposals	Paper S-101PT5-18 to be considered by the DCEG Sub-group (November 2020).	S-101 DCEG Sub-Group/S-101 Portrayal Sub-Group	Ongoing	To be discussed at DCEG SG meeting January 2021.
S-101PT5-22	S-57 to S-101 Encoding	Liaise with the S-100WG lead on S-57 to S-101 conversion (Jonathan Pritchard) on strategies that may be adopted for S-57 datasets to facilitate S-57 to S-101 conversion	S-101 DCEG Sub-Group	Ongoing	Ongoing liaison with conversion sub group is required.
S-101PT5-23	NIWC Testbed Update	DCEG Sub-Group to discuss the following issues raised in the NIWC Testbed Update report (S-101PT5-21 – listed by the associated Presentation slides): Slides 15, 21, 27.	S-101 DCEG Sub-Group	Ongoing	To be discussed at DCEG SG meeting January 2021.

S-101 DCEG SUB-GROUP MEETING (1)

International Hydrographic Organization

DCEG Sub-Group meeting – 21-22 January 2021.

- Small group established to review scaleMinimum and data coverage guidance.
- Associations: Recommend that a small group is established at the S-101PT (or possibly S-100 level) to address all issues related to Associations in S-101/S-100.
- Dataset load/unload: Recommend that a small group is established at the S-101PT level to review ENC dataset load/unload processes.

The following notes apply to Table 2.7 below:

1. Producers should be prepared to deviate from the step values specified when the significance of the feature dictates, for example the recommended number of steps for a **Light** feature is 4, but there will be circumstances where a **Light** feature is so important that no **scale minimum** value be applied; alternatively, the light could be so minor that a step value of 1 can be applied.
2. **Scale minimum** should only be applied to navigational aids where they contribute to "screen clutter" and where their removal from the display does not constitute a risk to safe navigation.
3. It is generally accepted that features making up a navigational aid will have the same attributes, and therefore features within a **Structure/Equipment** association (see clause 25.14) should be assigned the same **scale minimum** value.
4. The elements comprising a range system (see clause 15.1.1) should have the same **scale minimum** value, which should be the value corresponding to the largest step value of the features comprising the range system. For instance, for a range system comprising a **Navigation Line**, **Recommended Track** and navigation aids, the decision may be not to apply **scale minimum** to the navigation aids (in accordance to Note 2 above), in which case the **Navigation Line** and **Recommended Track** should also not have **scale minimum** applied. Similarly, all features comprising a routeing measure (see clause 10.2) should have the same **scale minimum** value.
5. Where features having curve or surface geometry extend over multiple **Data Coverage** areas (see clause 3.4), the value for **scale minimum** should be populated based on the value corresponding to the smallest scale value indicated by the attribute **maximum display scale** for the **Data Coverage** areas. The same approach should also be considered for items included in feature associations such as range systems and routeing measures, also taking into account Note 4 above.

FEATURE	PRIMITIVE	CONDITION	scale minimum STEPS
Administration Area	Surface		3
Anchorage Area	Point/Surface		2
Anchor Berth	Point/Surface	If **restriction** defined	3
Anchor Berth	Point/Surface		1
Airport/Airfield	Point/Surface	If **visual prominence** = *1* (visually conspicuous)	3
Airport/Airfield	Point/Surface		1
Archipelagic Sea Lane Area	Surface		4
Archipelagic Sea Lane Axis	Curve		4
Beacon Cardinal	Point		3 (see Notes 2, 3 & 4 above)
Beacon Isolated Danger	Point		4 (see Notes 2, 3 & 4 above)
Beacon Lateral	Point		3 (see Notes 2, 3 & 4 above)
			3 (see Notes 2

The **Data Coverage** features within a dataset must not overlap, however **Data Coverage** features from different datasets may overlap if they have differing maximum display scales. All data within a dataset must have the same minimum display scale, but portions of a dataset can have a different maximum display scale, depending on the best scale required for navigation in an area for the purpose of the ENC data.

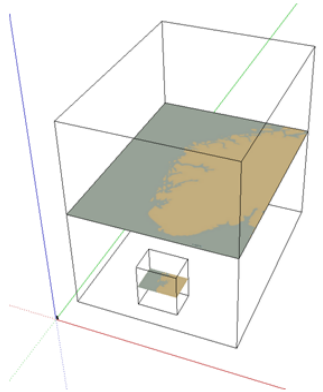

Figure 2.2 - Example of scale ranges

There must be no gaps in data between adjoining datasets if they share the same scale range in part or in full. Similarly, there must be no overlapping data between datasets if they share same scale range in part or in full, except at the agreed adjoining producer data limits, where, if it is difficult to achieve a perfect join, a 5 metre overlapping buffer zone may be used.

S-101 DCEG SUB-GROUP MEETING (2)

International Hydrographic Organization

- Consolidation of draft S-101PT6 Paper addressing the recommendations of the DQWG for improvements in data quality indicators in ECDIS.
- Resolving of issues identified from the Sub-Group review of the DCEG conducted during November 2020 (some issues resolved by correspondence post-meeting, with several requiring further action).

S-101 Annex A – DCEG; Draft Edition 1.0.1 | Date: **28 October 2020** | Document: **S-101 DCEG Draft 1.0.1**

1	2	(3)	4	5	(6)	(7)	
Component	CO[1]	Clause No./ Subclause No./ Annex (e.g. 3.1)	Paragraph/ Figure/Table/ Note (e.g. Table 1)	Type of com-ment[2]	Comment (justification for change) by the CO[3]	Proposed change by the CO	Secretariat observations on each comment submitted
	rmm	various		ed	Will this be Edition 1.1.0 or 1.0.1? The PT5 paper and file name say 1.1.0 but in the cover page, document history, and other places in the document it says 1.0.1.	Harmonize version numbering.	Decision from S-101PT5: An "interim" Edition 1.0.1 will be published to allow revised modelling implementation in test beds (based on S-100 Ed 4.0.0). Edition 1.1.0 will be based on S-100 Ed 5.0.0. DCEG Sub-Group: Accepted.
	IC	1.1	Para 3	ed	To reflect current website URL using HTTPS, propose update in other locations however comment made once.	Amend IHO Website address to https://iho.int/	Applied. DCEG Sub-Group: Accepted.
	IC	2.5.8			Consequential impact UOC guidance added but should CATSEA be extended to specifically cater.	Consider adding beach to CATSEA?	To be discussed DCEG Sub-Group: No action at this stage.
	FR	2.5.9		te	If the Scale Minimum policy is implemented as currently described in the DCEG, steps 3 and 4 may very often not be applied by the ECDIS for they will have a scale value smaller than the Maximum Display Scale of next ENC (smaller scale). Being aware that this is already the case in S-57, suggest to review the Scale Minimum policy to better fit with Maximum Display Scales and Minimum Display Scales. Ideally, should take into account the "sequence" of ENCs in the area portfolio, but this is not an easy task!	Review the Scale Minimum policy to better fit with Maximum Display Scales and Minimum Display Scales. If the DCEG sub Group agrees for a review, suggest recruiting some volunteers (Shom would be part of them).	Agree that a small group of volunteers should look into this. To be discussed. DCEG Sub-Group: **Small group to discuss sample scaleMinimum policy. Fr (lead), IHO Sec.** **IHO Sec to email sub-group for volunteers.**
	FR	2.5.9		te	One ENC may contain various Data Coverage objects.	Add guidance on the relation between the scale minimum policy and Data Coverage meta objects.	A new Note 5 has been included before Table 2.7 in clause 2.5.9, for consideration of the Sub-Group. DCEG Sub-Group: Accepted. **To be further reviewed by small scaleMinimum group.**

S-101PT6-12_Rev1

Paper for Consideration by S-101PT6

Alternative for Modelling of Quality of Bathymetric Data

Submitted by:	S-101 DCEG Sub-Group
Executive Summary:	This paper summarizes the recommendations of the DQWG for the display and performance of bathymetric data quality indicators in ECDIS, and proposes alternative S-101 DCEG modelling to cater for these recommendations.
Related Documents:	Papers for DQWG15, Agenda Item 5 and report on Agenda Item 5 in DQWG15 final Minutes. S-100WG5-03.8 – *Data Quality Working Group Report* S-101PT5-16 – *Quality of Bathymetric Data and ECDIS Performance* DQWG Decision Tree for evaluation of quality of bathymetric data (https://iho.int/uploads/user/Services%20and%20Standards/DQWG/Reference%20Documents/Data%20Quality%20Decision%20Tree_9July2019.pdf) HSSC12-05.5C – *Conversion of M_QUAL/CATZOC to S-101* S-101 Annex A – *Data Classification and Encoding Guide*
Related Projects:	S-101 development; presentation of data quality information in ECDIS.

Introduction / Background

1. The IHO Data Quality Working Group (DQWG) has been tasked since 2007 by the Hydrographic Services and Standards Committee (HSSC) to develop recommendations for improvements in the presentation of data quality indicators in ECDIS. These recommendations were finalised at the DQWG15 meeting in January 2020 and presented to the HSSC, where it was decided to pass the outcome and recommendations to the S-101PT for further action (HSSC Decision and Action HSSC12/48 refers).

2. This Paper provides a summary of the recommendations as determined by the DQWG and describes the possible impacts of these recommendations on the S-101 Data Model; in particular in relation to the Quality of Bathymetric Data Meta feature. Two options for alternative modelling of the Quality of Bathymetric Data feature are also proposed for consideration of the S-101PT, in addition to corresponding changes to other impacted features from the DQWG recommendations.

SIGNIFICANT CHANGES IN DCEG SINCE S-101PT5 (1)

- Association Tables in features sections rationalized and more concise explanatory guidance included in Section 15 [noting that further work is required for Associations as a whole].

5.5 Island group

IHO Definition: **ISLAND GROUP**. A named group of islands, including archipelago's.				
S-101 Geo Feature: Island Group				
Primitives: None				
Real World	*Paper Chart Symbol*	*ECDIS Symbol*		
S-101 Attribute	**S-57 Acronym**	**Allowable Encoding Value**	**Type**	**Multiplicity**
feature name			C	1,*
display name			(S) BO	0,1
language		ISO 639-2/T	(S) TE	0,1
name	*(OBJNAM) (NOBJNM)*		(S) TE	1,1
INT 1 Reference: **5.5.1 Island groups** If it is required to encode the name of a group of islands, it must be done using the feature **Island Group**, with all relevant **Land Area** features (see clause 5.4) included in the aggregation association. Remarks: • Names of individual islands within an island group must be encoded using the attribute **feature name** on the relevant **Land Area** feature. Distinction: Land Area; Land Region.				

Feature/Feature associations: **Island Aggregation**; **Updated Information**; **Text Association**

Feature/Information associations: **Additional Information**

25 Association Names

The following diagrams are examples to demonstrate the structure of the feature association tables included in the following clauses, as they may be correspondingly represented in UML. The examples are taken from the UML Relationship Diagram for the feature **Two Way Route Part**. The complete relationship diagram is shown in Figure 25.1 below.

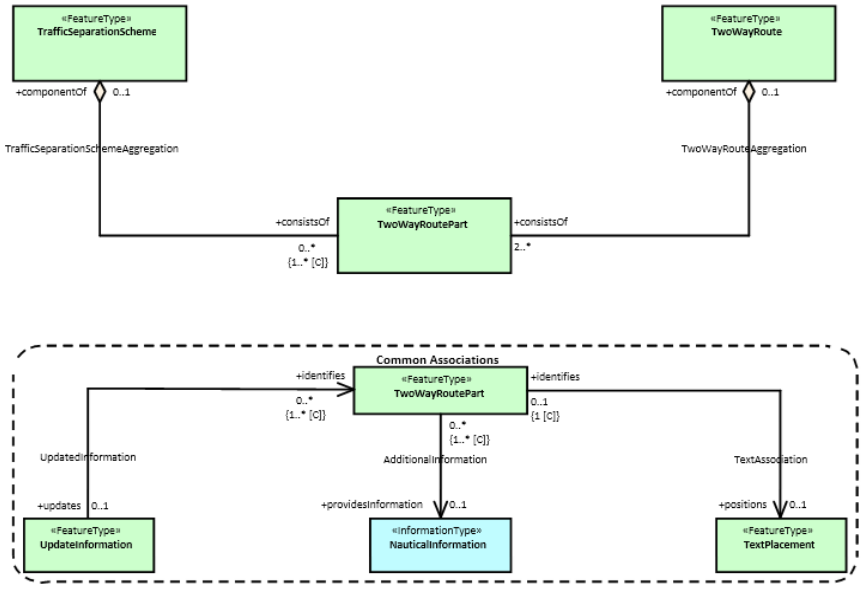

Figure 25.1 – Two-Way Route Part UML relationship diagram

NOTE: The association **Spatial Association** (see clause 25.13) is not included in Figure 25.1 above, as this association identifies the relationship between a feature type and the spatial type to which it is bound (that is, the geometry to which the feature is bound, rather than the feature itself).

SIGNIFICANT CHANGES IN DCEG SINCE S-101PT5 (2)

- Feature BuoyEmergencyWreckMarking amended to BuoyNewDangerMarking to be consistent with IALA terminology for these aids to navigation.
  - Corresponding amendment made to attribute virtualAISAidToNavigationType value *12* – name changed to from “emergency wreck marking” to “new danger marking”.

20.6 New danger marking buoys

IHO Definition: **BUOY, NEW DANGER MARKING**. A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary – S-32).

A new danger marking buoy is a buoy moored on or above a newly identified danger, such as a wreck, designed to provide a prominent (both visual and radio) and easily identifiable temporary (24-72 hours) first response. (Adapted from UKHO NP 735, 6th Edition).

S-101 Geo Feature: **Buoy New Danger Marking**

Primitives: **Point**

Real World	*Paper Chart Symbol*	*ECDIS Symbol*

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
buoy shape	(BOYSHP)	1 : conical 2 : can 3 : spherical 4 : pillar 5 : spar 6 : barrel 7 : superbuoy 8 : ice buoy	EN	1,1
colour	(COLOUR)	1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink	EN	1,* (ordered)
colour pattern	(COLPAT)	1 : horizontal stripes 2 : vertical stripes	EN	0,1

Edition 3.1, Appendix A – Chapter 2, Page 2.47, November 2000).

8) **preferred channel to starboard**

IHO Definition: At a point where a channel divides, when proceeding in the “conventional direction of buoyage”, the preferred channel (or primary route) is indicated by a modified starboard-hand lateral mark. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.47, November 2000).

9) **isolated danger**

IHO Definition: A mark used alone to indicate a dangerous reef or shoal. The mark may be passed on either hand. (Adapted from IALA International Dictionary of Marine Aids to Navigation).

10) **safe water**

IHO Definition: Indicates that there is navigable water around the mark. (Adapted from UKHO NP 735, 5th Edition).

11) **special purpose**

IHO Definition: A special purpose aid is primarily used to indicate an area or feature, the nature of which is apparent from reference to a chart, Sailing Directions or Notice to Mariners.

12) **new danger marking**

IHO Definition: A mark used to indicate the existence of a recently identified new danger, such as a wreck.

Remarks:
- No remarks.

SIGNIFICANT CHANGES IN DCEG SINCE S-101PT5 (3)

- Removed references to conversion of paper charts throughout.

Remarks:

- For rocks which do not cover (islets), see clause 5.4.2.
- All **Underwater/Awash Rock** features should be encoded using one of the above combinations of attributes.
- For guidance regarding the population of the complex attribute **vertical uncertainty**, see clause 3.7.1.3 (**Quality of Bathymetric Data**).
- Where **Underwater/Awash Rock** is encoded, there must be no **Sounding** feature encoded coincident.
- For area rock and coral reef features, see clause 12.1.1.
- When a group of rocks is surrounded by a danger line, each rock should be encoded as a separate **Underwater/Awash Rock** feature covered by an obstruction area feature (**Obstruction** – see clause 13.6).
- If it is required to encode an **Underwater/Awash Rock** feature where the attribute **value of sounding** is populated with an empty (null) value, but the source information indicates the depth of the feature is within the range of the surrounding depth area, the value **exposition of sounding** = *1* (within the range of the surrounding depth area) must be populated in order to avoid the unnecessary display of isolated danger symbols in ECDIS.

Distinction: Obstruction; Seabed Area; Sounding; Wreck.

Teh Stand
Deleted: ¶
Feature/Information associations

Teh Stand
Deleted: A rock represented on paper charts by a spot sounding and an associated nature of seabed (underwater rock not dangerous to surface navigation) should be encoded using a single **Underwater/Awash Rock** feature, with the sounding value encoded using the attribute **value of sounding**.

SIGNIFICANT CHANGES IN DCEG SINCE S-101PT5 (4)

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- Removed date dependent complex attribute **fixedDateRange** from Skin of the Earth features **DockArea** and **LockBasin**.
  - Surface is only allowable primitive, therefore this complex should not be allowable for these features.
- Added **fixedDateRange** to **DryDock** (removed from Skin of the Earth in S-101.

8.15 Dry dock

IHO Definition: **DRY DOCK**. An artificial basin fitted with a gate or caisson, into which vessels can be floated and the water pumped out to expose the vessel's bottom. Also called graving dock. (IHO Dictionary – S-32).

S-101 Geo Feature: Dry Dock (DRYDOC)

Primitives: Surface

Real World	*Paper Chart Symbol*	*ECDIS Symbol*

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
condition	(CONDTN)	1 : under construction 2 : ruined 3 : under reclamation 5 : planned construction	EN	0,1
depth range minimum value	(DRVAL1)		RE	0,1
elevation	(ELEVAT)		RE	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			C	0,1
date end	(DATEND)	ISO 8601: 2004	(S) TD	0,1
date start	(DATSTA)	ISO 8601: 2004	(S) TD	0,1
horizontal clearance length			RE	0,1

8.20 Locks

IHO Definition: **LOCK BASIN**. A wet dock in a waterway, permitting a ship to pass from one level to another. (IHO Dictionary – S-32).

S-101 Geo Feature: Lock Basin (LOKBSN)

Primitives: Surface

Real World	*Paper Chart Symbol*	*ECDIS Symbol*

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
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
horizontal clearance fixed			C	0,1
horizontal clearance value	(HORCLR)		(S) RE	1,1
horizontal distance uncertainty	(HORACC)		(S) RE	0,1
horizontal length	(HORLEN)		RE	0,1
horizontal width	(HORWID)		RE	0,1
status	(STATUS)	1 : permanent 4 : not in use 6 : reserved 8 : private 13 : historic 14 : public 16 : watched 17 : unwatched	EN	0,*

Teh Stand
Deleted: fixed date range

Teh Stand
Deleted: un-watched

INT 1 Reference: F 41.1

8.20.1 Locks (see S-4 – B-326.6)

A lock is an enclosure at the entrance to a canal or non-tidal basin. Its ends are closed by lock gates.

If it is required to encode a non-navigable lock basin, it must be done using the feature **Lock Basin**.

Remarks:

- If the lock is navigable at the maximum display scale of the ENC data, it must be encoded using the features **Depth Area** or **Dredged Area** (see clause 11.7.4), and the geo features making up the limits of the 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 an an associated instance of the information type **Nautical Information**, complex attribute **information** (see clause 24.4).
- 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**

PROPOSED REMODELLING OF QUALITY OF BATHYMETRIC DATA

- To be discussed under Agenda S-101PT6-12.

S-101PT6-12_Rev1

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RECOMMENDATIONS

- **S-101PT** to discuss the establishment of a Sub-Group (at WG or PT level) to review and consolidate all specification/guidance related to Associations in S-100 and S-101.
- **S-101PT** to discuss the establishment of a Sub-Group to review ECDIS dataset load/unload processes.
- **S-101PT** to endorse the publication of S-101 DCEG Edition 1.0.1, to be finalized on application of changes associated with decisions related to paper S-101PT6-12; and preparation of the corresponding S-101 Edition 1.0.1 Feature Catalogue.

ACTIONS REQUESTED

- **Note** the report of the S-101 DCEG Sub-Group.
- **Discuss** the recommendations included in this report.

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FURTHER INFORMATION OR DISCUSSION

IHO Technical Standards Support:

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