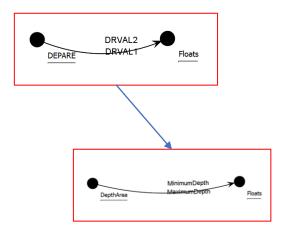
# S-57 to S-101 Conversion Subgroup update

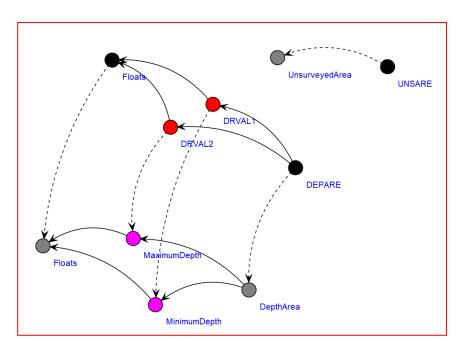
## Progress So Far...

- Conversion Subgroup
- Three VTC meetings
- Current Activities
  - Working through spreadsheet of remodelled items
  - Focus is on "edge cases"
  - Preparation of output document "Conversion Guidance"
  - Testing...
- Good participation from data producers, RENCs and industry participants.

# Types of Conversion

- Simple dictionary conversion
  - Where feature and attribute bindings don't change and are just re-labelled
  - Mapping from feature->feature and attribute->attribute
  - 80% of content of current ENCs
- Edge Cases
  - Geometric primitives which have changed/dropped
  - Changes to enumerations / meanings
  - New/Dropped features
  - Relationships/Associations
- Special considerations
  - Hazards / Alerts features
  - Where portrayal may be different
  - Where manual intervention may be required
  - Adaptation to Producer's encoding





	S-101PT decisi	on: Not required	B	e incineratio	n areas no lo D	noer exist and are prohibited (refer S-4	- R-449.3)		F		G	н						к		м	М		0	
5	-57 Features,	<u>₩</u> <del></del>	-				7				Conversion Processes and		-				Ŧ	-	-	7 7	1	Ŧ		
3	S-57 Acrony	m	/alue	Not in S-101	Remodelled in S-101	Remodelled To		c	Comments		Requires Data Preparation	Requires Cartographic Input	Requ Data Configu	aset Co	omment			Category of Conversion	Existing S-58 test applies	UOC Section	S-101->S-57 conversion No	tes	id	Issue
1. For enumerate values not allowed in 5-101 PT used 5-55 C the& 2000 as the principle reference in its deliberations. Other citeria used were determination of a "default" state where the value is self-evident and would not add any additional information relevant to ade navigation and protection of the marine environment (for instance lights features, attribute colour = 2 (bitek)); and values specific feature (for instance lights features, for instance and lights features, attribute colour = 2 (bitek)); and values specific feature (for instance lights features (for instance navel Construction values 4 (hard variable)).										General Notes : 5-57 to 5-101 Conversion Section. Column Heading Descriptions. (Requires Data Preparation) - Need inspection and potential editing by data producer prior to conversion. (Cartographic [In p]) Requires cardiographic/Manual Jupto one conversion is done, so conversion can not be performed automatically in all cases. (Dataset Configuration) - Need configuration parameters to be present for automatic conversion to take place. (Comment) - notes on how conversion shuld be done where not automatic These should be as explicit as possible but can refer to others to avoid repetition (i.e. if the same method is used)					es									
1	. Where possi	ble, optional end	oding/conversi	on is identifi	ed where h	e removal of an enumerate value res	lts in a S-101 mandatory attribute having								7									
4	EATURES	ere names of ite	ms (mainly en	umerates) ha	ve been ame	ended in S-101 (for instance, to remo	e "aliases" and acronyms) but the mappir	ng remains	the same have not been included in this t	table.					/		П						_	
		and (P) denotes	features not in	cluded by d	esignated ar	ea, line or point geometric primitive	only.																	
E	RIDGE (P)			x			S-101PT decision: Not required in S-10 water (note also that BRIDGE of type p									1		Dropped(Primitive) -						
tin	<u> </u>	rrata	riat R	bm	delli	ng spreadsho	type point is included in an	He	eader, and								ł	÷						
	AGGR	u cla			×	ArchipelagicSeaLane: Bridge:	These features are required to be asso	٠	Requires Da	ata Pre	eparation				/			? *						
						DeepWaterRoute; FalrwaySystem; IslandGroup; MooringTrot; RangeSystem; TrafficSeparationScheme;	feature associations (refer to S-101 DC	•	Requires Ca	-	-		l) Inp	put		urce features and also many S-101		Associations +						Git
0	_ASSO				x	TwoWayRoute Refer to DCEG Section 25.		•	Requires Da	taset	Configurati	on						Associations ~	+					
t							S-101PT decision: Not required in S-10 water (note also that some encoding of				-													
	DAMCON (P)			×			not display in ECDIS). NOTE: Suggest should be converted in S-101 to a Lan	•	Comment (s	hort -	forlonger	com	rrent	sus	æ a github issue)			Dropped(Primitive) *						
	DEPARE (L) DOCARE			X	x	DockArea	NOTE: DockArea is a Group 1 feature in	n S-101, th	erefore underlying Group 1 features mus	st be amended			-	Fe	eatures which are NOT Group 1 features in S-57 but w	hich ARE Group 1 in S-101 can be		Dropped(Primitive) *	H					
							from S-57 to S-101.		pping coverage of Group 1 features when		x		x	x fo ur	onverted automatically if (1) An appropriate topologic pr use and (2) if the producer is prepared to accept th nderlying Group 1 feature. For instance, if the produc nderlying UnsurveyedArea then the S-S7 cell should b htth the DOCARE which can be replaced with DOCARE	e definition of a feature to act as the er is content to replace all DOCARE with be prepared with an UNSARE coincident	th n	Group 1					×	Git
0	GRIDRN (P)			X					hat GRIDRN of type point does not display incineration areas no longer exist, and are				_					Dropped(Primitive)					$\sim$	
•	CNARE			x			S-4 - B-449.3).	- marine	incineration areas no longer exist, and are	e promoted (rei							7	Dropped(Deleted) -						
ī	IGHTS				x	LightAllAround			RIENT are not present; or where CATLIT # itional remodelling of features and attribu		-			Gri	ouping of Remodell	ling items 🗹		Lights ~				-	21	
12	NDMRK	CATLMK =	6		X	flareStack (Boolean type attribute)					×			G	• •			AttributeTransformation ~			1		22	
	ACCY A_COVR				X	QualityOfNonBathymetricData DataCoverage	Where an S-57 ENC contains M_CSCL of	blect(s), th	e DataCoverage feature in S-101 is a conca	atenation of			-	•	Group1			Meta *		l indet	oGitHub			
	A_CSCL					DataCoverage	M_COVR and M_CSCL. See M_CSCL bel mandatory attribute maximumDisplaySe	low for geo cale.	ometry and M_CSCL / CSCALE below for pe	opulation of the				•	Attribute Transforme	ation /		Meta +						
							features in the area of the dataset cont	taining dat	r complete, non-overlapping coverage of ta. NCs must be spatially related to the WGS8					•	Lights	<u> </u>		Meta *						
	I_HDAT			x			s-101PT decision: Not required in S-101 prohibited in S-57 ENC (refer S-57 Apper S-101PT decision: Not required in S-101	ndix B.1, cl	lause 3.2).	o datum. is dis				•	Aids			Dropped(Deleted) *						
ľ	A_HOPA			x			Refer to attribute entries below associat allow information captured in the S-57	ted with M object cla	I_NPUB. NOTE: While the solutions inclu ss M_NPUB to be converted to features i deletion and inclusion in other S-100 bas	in S-101 ENCs,	x		+	•	Meta			Meta *						
	/_PROD			x			Specifications. S-101PT decision: Not required in S-101	L.						•	Associations		_	Dropped(Deleted) *						
				×	×	SubmarinePipelineArea	below. S-101PT decision: Not required in S-101	L, noting th	RE and SubmarinePipelineArea, unless des nat PIPSOL of type point does not display i	in ECDIS. NOTE:			+	•	CATZOC			AttributeTransformation * Dropped(Deleted) *						
L	IPSOL (P)			*			feature in S-101. If on land should com	vert to a L			×			•	Bridges			propped(beleted)						
F	ONTON				×	Pontoon	amended to provide complete coverag	e of Group	, therefore surrounding Group 1 features 1 features when converting from 5-57 to	o S-101.		×	×	be	outon and then a portion reature coincident with n equired is the preference as to what the substitute (S- e. Suggestion: UnsurveyedArea? Shouldn't require an pincident (unless more complex mapping is required)			Group 1 👻						
	ECTRC (A)			x			S-101PT decision: Not required in S-101	. NOTE: S	Suggest that RECTRC of type area convert	t to a					ee notes. Requires decision by data producer.		-	Dropped(Deleted)	1					

### GitHub Issues

 Issues under discussion currently

> Implemented Support new Bridge

- Group 1 changes
- InTheWater
- Bridges
- INFORM
- Associations

	kusala9 commented on 2 Jan Collaborator Author 😳 …						
	SOE C DepthArea						
	SOE						
54()	Christian-Shom commented 9 days ago Collaborator						
	<ul> <li>HULKES: agree that Unsurveyed Area should be created during the conversion as S-101 SOE (Skin Of the Earth) coincident with Hulk (this would need no change to prepare the S-57 data). Ideally there should be Depth Areas, but (recent) bathymetry under the hulk may be unknown (there may be obstructions), and the hulk may overlap different depth areas which complicates the conversion.</li> <li>FLODOC and PONTON: as these objects are also situated in the water, in favour of having the same rule then above for these objects.</li> <li>DOCARE and LOKBSN: S-57 underneath SOE object (LNDARE, UNSARE, etc.) to be "cut off". Probably needs to be tested if geometry have to be separated first by the HO or if the converters can do the job.</li> </ul>						
la manta di Da matina manta	kusala9 commented 7 days ago Collaborator Author 🕑 …						
olemented Requirements	If the DOCARE/LOKBSN have a coincident polygon shared with and existing group1 (e.g. DEPARE) then it's much easier as a new feature can be created. Otherwise some geometry intersection and topology operations have to happen in the converter (difficult), so, this might be one where it can be made easier by pre-preparing the conversion process						
Implemented DCEG modeling							
Limitation discovered when a multiple bridges	tdepuyt commented 6 days ago						
<ul> <li>Each bridge touching that shared pylon gets converted aggregation</li> <li>All features convert correctly</li> <li>Potential solution</li> <li>Create a C_AGGR</li> </ul>	d as the same bridge						

- 1<sup>st</sup> Draft commenced by IHD Secretariat
- Conversion Guidance document in preparation
- Mirrors UC structure

				Conversion				
S-57 to S-101 Conversion Guidance		Guida	ance				S-57 to S-101 Conver	rsio
Object class within this document, all encoded dates will be populated attribute automatically on conversion.					in the corresponding S-101 file new S-101 dataset.	nan		
2.1.5.1 Seasonal Objects							ability and accuracy of bathym	netr
Unless otherwise stated against an individual Object class within the encoding of attribute STATUS = 5 (periodic/intermittent) will be populat 000 which encoders				Quality of b	athymetric data	(A)		
101 attribute status on conversion. Unless otherwise stated against an individual Object class within th		Edition 0.0	.1 – January 202		Quality of Bathymetric Data			
complex attributes periodic date range on conversion.		Edition 0.0	.1 – January 202	rences in the tric Data Me	rences in the data modelling between the tric Data Meta feature constitute one of the I data model, the defining S-57 CAT2OC att nt parts of position and depth accuracy; an been done in order to provide the mariner v			
The encoding guidance for taking into account leap years ('last day in Fe remains unchanged in S-101.				nt parts of po been done in				
2.1.6 Times						1045 AV (0.000 AV (0.000	ncluded in the ENC dataset.	
The attributes TIMEND and TIMSTA are date Time type attributes and there are no corresponding date Time attributes in S-101. The S-101 a time of day start are time type attribute with 3 possible formats of enc local time) and are only bound to the S-101 information type Service H						d in CATZOC detected (c	Confidence in Data: During 1 C will be used to populate the 3 complex attribute), full seaflor attribute) and vertical uncertain	S-1
During the automated conversion process, the time component ( <i>htmms</i> be populated to the time of day end and time of day start attributes in to the end to indicate that the time is UTC. Data Producers will be re they wish to express the time as UTC + offset or local lime.	ІНО			ributes will co 2 – Attributes these values ric data quali	ributes will correspond to the values shown 2 – Attributes, as amended by S-57 Suppler these values in order to provide more accurr ric data quality to the mariner, given that the tested for any empresent (can be a definition)			
2.1.7 Cells							ich component (see also addition son, and also so as to ensure (	
As for S-57, the coordinate multiplication factor for latitude and lon 10000000 (10 <sup>1</sup> ). The value in the Coordinate Multiplication Factor [C Parameter [DSPM] field is directly translated to the "Coordinate Multipli [CMFX] and "Coordinate Multiplication Factor for Y-coordinate" [CM Structure Information" [DSS] field for the S-101 dataset.	٩	International Hydrographic Organization				ric data quali ice in data is rived. e S-57 attribu	ty in the "dual-fuel" ECDIS enviro included as identical to the S-57 ites POSACC or SOUACC have ZOC indicates, these values will	onm 7 CA
2.1.8 Seamless ENC coverage						h accuracy	in populating the horizontal pe	osi
The rules regarding ENC coverage remain unchanged for S-101.							ing the automated conversion pr ne S-101 mandatory attribute da	
2.1.8.1 Feature Object Identifiers				Pt International Hydrographi 4b q	iblished by the c Organization	utter in some	ECDIS display modes through p	pop
New Feature Object Identifiers (FOID) will be assigned to all S-57 obje features. It is expected that the assigning of new FOIDs within a data the same rules as in S-57 (that is, each feature must have a unique FO individual real-world feature within the cell may have the same FOID. FOID to identify instances of the same real-world feature in different in different			lly in depths d cannot be n ere CATZOC stric Data will	se where an indication of the over deeper the 200 metres. However hade during the automated conver- construction of confidence U (dat have data assessment population of the second have data assessment population of the second of the second have data assessment population of the second of the second have data assessment population of the second of the second of the second have data assessment population of the second of t	However, ed conversi e U (data n t populated			
datasets is not possible during automatic conversion. Data Prod relationship will be required to manually amend these instances.						Variation: the Data Pro	The S-101 mandatory attribute o oducer to incorporate the tempo	oral
2.1.8.2 180° Meridian of Longitude						e seabed is life	kely to change over time, or in the automated conversion process	ie w
The rule prohibiting datasets from crossing the 180° meridian remain u						e of confidence	ce U (data not assessed)), the c	corre
2.2 Data quality description					fund	ctionality, Data Pro	mporal variation populated with ducers will be required to reass	sess
2.2.1 Production information						TZOC = 6 (zone o ulated with value 6	of confidence U (data not asses 3 (unassessed).	ssec
The Producing Authority provided in the "Producing Agency" [AGE Identification" [DSID] field is populated in the mandatory producingAgence Metadata for the S-101 dataset.	N] subfield of the ' y field of the Dataset	Data Set Discovery			ature Detection: The S-101 complex attribute feating dication of the minimum size of significant feature			
2.2.2 Up-to-datedness information							<ul> <li>e size of features detected.</li> <li>for full capability S-101 data, D</li> </ul>	
Up-to-datedness information (provided in the "Edition Number" [EDTI "Update Application Date" [UADT] and "Issue Date" [ISDT] subfields					attri	bute manually, if c	onsidered necessary.	
S-XX January 2021	Ed	ition 0.0.1			S-X	X	January 2	021

S-XX

### rsion Guidance

name and Dataset Discovery Metadata fields to

netric data

(S) (S-101 DCEG Clause 3.7)

S-57 M\_QUAL Meta object and the Quality of most significant changes from S-57 to S-101. In bute has been effectively "deconstructed" into its seafloor coverage (including feature detection). ith more detailed information as to the quality of

the automated conversion process, the value S-101 mandatory attributes data assessment, or coverage achieved, horizontal position nty (complex attribute). The values populated for in the ZOC table included in S-57 Appendix A, ment No. 3. Data Producers may choose to rete indications of these individual components of automated values populated will correspond to nal comments for the data assessment attribute consistent portrayal of the indication of overall onment, the S-101 attribute category of zone of 7 CATZOC attribute, from which ECDIS portrayal

been populated for M\_QUAL to indicate a higher override the CATZOC categorisation of position osition uncertainty and vertical uncertainty rocess.

ta assessment introduces an option to reduce copulation of value 2 (assessed (oceanic)). This erall data quality is not considered to be required er, determination as to when this value may be ersion process, therefore for all M QUAL except ta not assessed)), the corresponding Quality of ated with value 1 (assessed).

category of temporal variation introduces the ral impact on bathymetric data quality in areas e wake of an extreme event such as a hurricane for all M\_QUAL except those where CATZOC corresponding Quality of Bathymetric Data will h value 5 (unlikely to change). For full S-101

ess the value of this attribute as required. For ssed)), category of temporal variation will be

re detection introduces the option to include an etected by higher quality hydrographic surveys, There is no corresponding encoding for this ata Producers will be required to populate this

Edition 0.0.1