

# 15<sup>th</sup> Meeting of the Hydrographic Services and Standards Committee

Report of the S-100 Working Group

Julia Powell (Chair)

Agenda Item 5.1



#### PRINCIPAL ACTIVITIES AND ACHIEVEMENTS

- Membership
   23 member states, 15+ industry members
- Meetings
  - S100WG7 (Monaco) 5-13 December, 2022
  - Test Strategy Meeting 9 (Seoul, ROK) -7-10 March 2023
- Chair
  - Ms. Julia Powell (US-NOAA)
- Vice Chair(s)
  - Ms. Elizabeth Hahessy (DK)
  - Ms. Izzy Kim (ROK)





#### PRINCIPAL ACTIVITIES AND ACHIEVEMENTS

- S-100 Edition 5.0.0 → Edition 5.1.0
- S-164 Edition 1.0.0
- S-101 Edition 1.1.0
- S-102 Edition 2.2.0

#### **HSSC 14 ACTIONS**

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5.1A	S-100	HSSC14/12	WGs developing S-1xx	HSSC-15
	Ed.5.0.0	(former HSSC13/17, HSSC12/08	product specifications to	
		1133C12/00	estimate the possible	
			associated costs needed to	
			support this alignment, and	
			report to the HSSC and S-	
			100WG Chair/HSSC	
			<b>Secretariat</b> in order to set up	
			priorities.	

 S100WG priorities have been the development of S-164 and S-101 Test Data Sets and has coordinated with the Secretariat to help fund these endeavors

#### **HSSC 14 ACTIONS**

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5.1E	SENC	HSSC14/25	S-100WG to consider the	HSSC-15	
		(former HSSC13/27)	SENC delivery issues raised by		
			France, add this work item in		
			its work plan (as part of testing		
			activities and the development		
			of S-164) to address and		
			demonstrate, through a security		
			risk analysis on the application		
			of S-100 Part 15, whether the		
			need for SENC distribution is		
			still justified in the S-100		
			world.		

 This item is still in work and will be investigated as part of the continued development of S-164



### **IHO MAINTAIN AND EXTEND S-100 [A.1]**

- S-100 Edition 5.0.0 was published in December 2022
- As Stakeholders begin S-100 Edition 5.0.0 implementation they are finding items that need to be revised and/or clarified
  - Part 8 Imagery and Gridded Data revisions for improved implementation
  - Part 17 Data Exchange revisions and clarifications as a result of early implementations
  - Part 9 revisions and clarifications to improve portrayal
  - And other smaller clarifications



IHO

#### **IHO RESOLUTION 2/2007 REVISIONS AND CLARIFICATIONS**

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#### Revision

Revisions are defined as substantive changes to a standard. Typically, revisions change existing specifications to correct factual errors; introduce necessary changes that have become evident as a result of practical experience or changing circumstances; or add new specifications within an existing section. Revisions could have an impact on either existing users or future users of a revised standard. It follows that a full consultative process that provides an opportunity for input from as many stakeholders as possible is required for standards listed in Appendix 1, optional for those listed in Appendix 2. Proposed changes to a standard should be evaluated and tested wherever practicable. The approval of Member States is required before any revisions to a standard can enter into force. All cumulative clarifications must be included with the release of approved corrections revisions.

However, there may be instances where more urgent action is required, especially where there are serious implications to safety of navigation. In such cases, a "fast-track" approval by correspondence and rapid implementation process may be needed. This should only occur in exceptional circumstances, but any such fast-tracked *revisions* will still require the approval of Member States before they can enter into force.

A revision shall not be classified as a clarification in order to bypass the appropriate consultation processes.

#### Clarification

Clarifications are non-substantive changes to a standard. Typically, clarifications: remove ambiguity; correct grammatical and spelling errors; amend or update cross references; insert improved graphics in spelling, punctuation and grammar. A clarification must not cause any substantive semantic change

to a standard. Clarifications are the responsibility of the relevant subordinate body and may be delegated to the responsible editor.



#### **IHO MAINTAIN AND EXTEND S-100 [A.1]**

- As we are entering a critical stage the S100WG is only considering revisions and clarifications for S-100
- Any proposals for extensions or that affects a change to the S-100 infrastructure will be held until after 2026.



## IHO MAINTAIN AND EXTEND S-100 [A.1] – TR 2/2007

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- S-100 is a framework
- Product Specification's are tied to specific editions of S-100
  - Edition 3.0.0 and Edition 4.0.0 are still valid editions

# First step Navigational Route Monitoring Mode S-101 ENC S-102 Bathymetry S-104 Water Level S-111 Surface Currents S-124 Navigational Warnings S-129 UKC Management Critical Framework IHO Geospatial Information Registry S-98 Interoperability Specification S-100 Universal Hydrographic Data Model S-164 Test Data Set for S-100 and ECDIS Type Approval



## **IHO MAINTAIN AND EXTEND S-100 [A.1]**

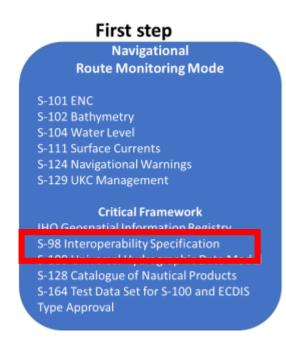
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> HSSC15 is requested to approve S-100 Edition 5.1.0 and forward it to MS via Circular Letter for Approval



## S-98 DATA PRODUCT INTEROPERABILITY IN S-100 NAVIGATION SYSTEMS [A.2]

- Part of the Critical Framework for S-100 ECDIS
- The S-98 subWG has merged with the S-164 subwg
- The specifications are closely tied together
- IHO is providing project management support via contract
- Medium to High Risk to not meeting 2024
   Edition 2.0.0 publication date





# S-164 TEST DATA SETS FOR S-100 AND ECDIS TYPE APPROVAL [A.5]

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- Completed Edition 1.0.0 which contains:
  - Landing page contents and links.
  - Up to date contents from existing S-64 and existing S-164 S-101 cells.
  - S-98 interoperability considerations.
  - Test drafts for user selected safety contour, Part 17 service aspects and Part 15 authentication and (optionally) encryption.
  - Documented Test Data schemes, versions, scenarios and user manual.
  - Datasets packaged as edition 5.0.0 exchange sets (including specific FC/PC/IC).
  - S-128 contents.
  - Initial Dual Fuel tests.
  - Test data in conformance with Ed 5.0.0 of S-100, draft where necessary.

#### First step

Navigational Route Monitoring Mode

S-101 ENC

S-102 Bathymetry

S-104 Water Level

S-111 Surface Currents

S-124 Navigational Warnings

S-129 UKC Management

#### **Critical Framework**

IHO Geospatial Information Registry

S-98 Interoperability Specification

S-100 Universal Hydrographic Data Model

S.139 Catalogue of Nautical Products

S-164 Test Data Set for S-100 and ECDIS Type Approval



## THE IHO TEST DATA SETS AND ITS RELATIONSHIP TO OTHER STANDARDS

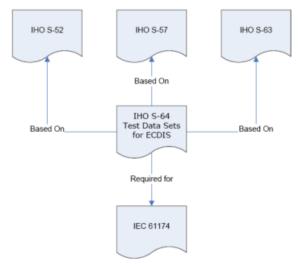
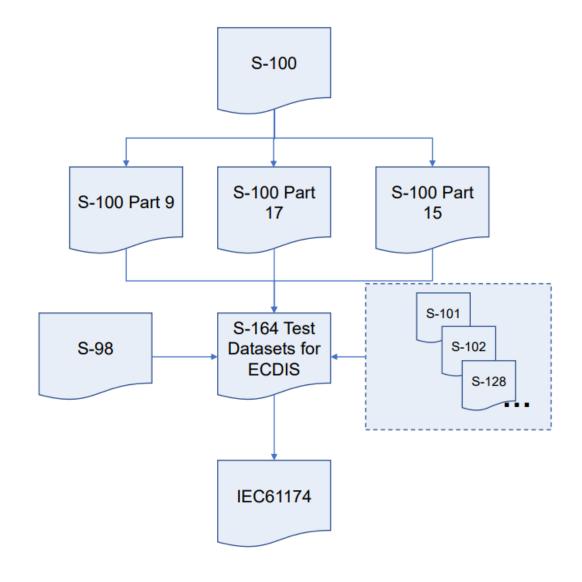


Figure 1 - The TDS and its relationship to other standards





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- 1. The format, structure and much of the language mirrors the existing S-64.
- 2. Some text has been left in and greyed out ("greyed out"). This should be ignored but is sometimes useful to understand where elements are not required under the S-164 regime.
- All the language in S-164 (with a few minor exceptions) is now S-100 based and refers to exchange sets, datasets, features/attributes and ENC.
- Brand new tests have a blue background, old tests and modified/enhanced tests are traditional S-64 green. For final publication these colours will be harmonised.

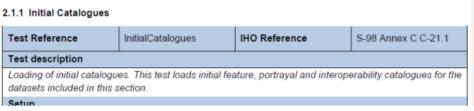
#### 2.1.1 Initial Catalogues

Test Reference	InitialCatalogues	IHO Reference	S-98 Annex C C-21.1
Test description			
Loading of initial catalogue datasets included in this s		ature, portrayal and interope	erability catalogues for th
Setup			
Clear all ECDIS catalogue	es and data contents		
Action			
Action  Load the exchange set Po	owerUpCatalogues		
Load the exchange set Po	owerUpCatalogues		
Load the exchange set Po Results Verify the version of the S information is shown in the	-101 feature catalogue and	d portrayal catalogue is con	ect. The correct
Load the exchange set Po	-101 feature catalogue and e following table:		/ Issue Date.
Load the exchange set Po Results  Verify the version of the S information is shown in the	-101 feature catalogue and e following table:	Version 1.0.1/20	/ Issue Date.

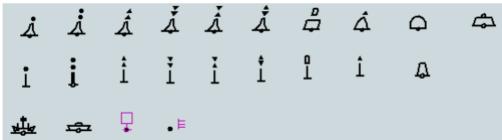
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#### Screenshots:

- There are no new S-100 screenshots yet and many of the tests still have the existing S-64 screenshots in them.
- Currently neither the datasets nor the portrayal catalogues exist to produce these definitively. Some will be produced based on the existing data available but these will be informative until more development of the test datasets and final version of catalogues is complete.
- A reference implementation of a Dual Fuel mode capable system will be required for tests requiring dual fuel mode.
- 2. Tests are now named (using CamelCase) rather than numbered in the tables. This makes management of the document substantially easier









- All data loading is done from named exchange sets. The existing S-64 requires install of individual datasets from named exchange sets (later...).
- There is a question over how to deal with the concept of "unofficial data" as determined by the producer code (later)
- "no data coverage" (S-101) does not exist in the S-100 world and those tests are no longer required.
- There may be a better way of describing the individual portrayal settings for each test. Standardised language for these could be defined.

Test Reference	4.1 d)	IHO Reference	S-52 10.1.8	
Test description	Test description			
No ENC data available.				
Setup				
As for test 4.1 a)	As for test 4.1 a)			
Ship position as follows: 3	Ship position as follows: 32°24.53'S 061°19.29'E (within ENC data coverage			
(M_COVR) where CATCOV = 2 (no coverage available)).				
Action				
Observe the display.	Observe the display.			
Results				
Confirm that a "No ENC available" indication is provided.				

Test Reference	4.1 e)	IHO Reference	S-52 10.1.8
Test description			
No ENC data available.			
Setup			
As for test 4.1 a)	As for test 4.1 a)		
Ship position as follows: 3	Ship position as follows: 32°27.88'S 061°20.66'E (an area with no ENC)		
Action	Action		
Observe the display.	Observe the display.		
Results			
Confirm that a "No ENC available" indication is provided.			



- A number of tests are no longer required in the "encrypted" dataset section (under S-57 service revision
  was almost entirely done within S-63), reflecting the simpler approach to service provision under S-100 (i.e.
  no PRODUCTS.TXT, SERIAL.ENC, STATUS.LST or large media support). As Part 17 implementations
  mature modifications may need to be made to S-164 tests.
- The S-164 draft is supported by an extensive spreadsheet which maps the named tests to the exchanges sets required and notes the contents of these exchange sets (and their requirements). This gives an outline of dataset requirements for S-164 support.
- 3. SENC import requirements are greyed out. There is nothing, technically, to prohibit rewriting the SENC import tests using S-100 language. This requires further discussion within the S-100WG

B	-	U	E	
Section	Test Name (Short)	Description	Exchange Set(s)	
atalogue Loading and System initialisation.	InitialCatalogues	succssful initial loading of multiple catalogues.	PowerUPCatalogues	
	InvalidCatalogues	Invalid feature catalogue	PowerUpCatalogues	
	InvalidPC	Invalid portrayal catalogue	PowerUpCatalogues	
			CorruptPortrayalCatalogue	
	OutOfSequenceCatalogues	loading datasets for which no valid catalogue exists	PowerUPCatalogues	
			UpdatedCatalogueData	
	UpdateCatalogues	successful updating of catalogues	PowerUPCatalogues	
			PowerUpCatalogueUpdates	
	NewCatalogues	succesful installation of new catalogues	PowerUpCatalogues	
			NewProduct	
Loading of Unencrypted Datasets	InitialPowerUp	Loading initial datasets (all products)	InitialPowerUp	



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## and...

#### References

- 1. IEC61174 and S-98 are still under development so the final references are not known in all cases.
- 2. These are being compiled separately and will be updated in the draft when complete.
- 3. A mapping of S-98 Annex C, S-100 Part 17 and S-100 Part 15 (and Part 9?) needs to be completed to ensure all new S-100 features are captured.
- Final checks of SSE codes from the S-63 ones to those tested in S-164 need to be done.

Test Reference	InitialPowerUp (2.1.1)	IHO Reference	IEC 61174/ 4.4.1	
Test description				
Loading of initial datasets	and indication of own ship	stationary position.		
Setup				
Load the following exchainitialPowerUp	nge set:			
Select Display Co Set the Safety Co Set the Safety Do Select Symbolize Select all Text gr Select Accuracy Select Highlight it Select simplified g	of TIGBSXOTTNW 000 with the stategory Other contour value to 8 m and Boundaries oups of the stategory of the	ne following settings:		
Ship position 32°29.66°S, 060°55.86°E Heading 234.0 degrees				
Action				
Load cells and view the c	oad cells and view the chart display.			
Results				



# S-164 TEST DATA SETS FOR S-100 AND ECDIS TYPE APPROVAL [A.5]

- S-164 continues to remain on the critical path
  - Edition 1.0.0 provides the framework, but the actual test data needs to be built
  - S-101 specific TDS is handled via the S-101PT
  - Other TDS's are part of in-kind support from ROK-KHOA/US-NOAA
- IHO is providing project management support via contract
- Medium to High Risk to not meeting 2024 Edition 2.0.0 publication date



# S-164 TEST DATA SETS FOR S-100 AND ECDIS TYPE APPROVAL [A.5]

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> HSSC15 is requested to approve Edition 1.0.0 of S-164 for initial implementation, testing and evaluation

NOTE: 2/2007 allows for HSSC to approve an initial edition



#### S-100 VALIDATION WORK [A.6]

- SubWG has been established
- Work is still progressing slowly
- Planning on several validation workshops
- The S-100 validation checks act in a similar fashion to S-58 as they will need to be updated independently to S-100 and S-98



#### S-100 VALIDATION WORK [A.6]

- HSSC15 is requested to allocate a new number (eg S-158) for S-100 level validation checks (including S-98)
  - This will allow for validation to be independent of S-100
  - May need to consider also adding in product specification validation for those specifications that are cited in S-98. These checks are currently located in the product specification itself.



## NOTES ON ROADMAP FOR THE S-100 IMPLEMENTATION DECADE

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- Route Monitoring versus Route Planning
- It has been noted that one needs route planning for route monitoring
- Recommend defining these as Phases
- Route Monitoring → Phase 1
- Route Planning → Phase 2
- Easier for project planning purposes as you can add later phases

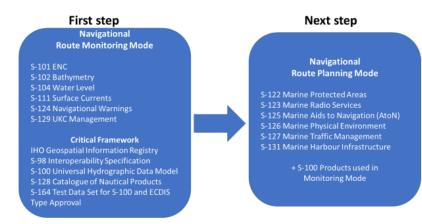


Figure 2 The IHO Navigational Package to be handled by the Interoperability Specification S-98. Additional layers may be added in the future.



## NOTES ON ROADMAP FOR THE S-100 IMPLEMENTATION DECADE

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> HSSC15 to consider updating the Roadmap to use Phase 1 and Phase 2 rather than Route Monitoring and Route Planning



## **S-100 INFRASTRUCTURE [C.1,2,3]**

No.	S-100 Infra-system	Update plan of S-100 5.0
1	S-100 GI Registry	2023, update to include requirements of S-100 5.0
2	Feature Catalogue Builder	2023, Update the tools working the S-101 FC
3	Portrayal Catalogue Builder	2023~2024, Creation of PC catalogue and validation check
4	DCEG Composer	2023, update in line with S-100 5.0.0
5	Symbol editor (Point/Line/Pattern)	2023~2024, Update SVG editing functions
6	IC Editor	2023~2024, First release in 2023 and improved in 2024



## S-100 INFRASTRUCTURE [C.1,2,3]

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Pri	ority	S-100 Tools	Update schedule in 2023
ati	1	Feature Catalogue Builder	Task: Management, User feedback and improvement Period: during 2023
	2	DCEG Composer	Task: FC Model, Feature/Information Association Period: Updated until June, Management from feedback
	3	Portrayal Catalogue Builder	Task: Revision of interface to create PC package and Validation Period: Updated until September, Report to S-100WG8
	4	IC Editor	Task : Stabilize and used to update IC Period : Updated until September, Report to S-100WG8
	5	Symbol editor (Point/Line/Pattern)	Task: update Point/Line editor, new development Pattern editor Period: Improve until October, Report to S-100WG8

TSM Actions	S	
TSM9/43	Setup IHO Github repository for the user feedback	Task: IHO and KHOA set up the Github repository Period: April, 2023
TSM9/44	S-100 Toolkit workshop	Task: host the S-100 Toolkit workshop to deliver new functions Period: October, 2023



#### IHO S-102 PROJECT TEAM UPDATE [D.6]

- S-102 has reached Edition 2.2.0
  - Non-nav content has been removed
  - Well-aligned with S-100 Edition 5.0.0
- According to the special provision for S-102 the S-100WG has approved the publication of Edition 2.2.0 for late May 2023



#### S-102 PROJECT TEAM UPDATE [D.6]

- Dealing with the non-navigation purposes of Bathymetry
  - Agreed at S102PT11 to recommend the creation of a separate S-1XX specification number for non-navigation purposes
  - Whether a separate number is created, work on non-nav purposes will be deferred until after S-102 Edition 3.0.0 is out for implementation
- This will be formally presented at S100WG8 in November 2023



#### IHO S-102 PROJECT TEAM UPDATE [D.6]

- S-102 Edition 2.3.0
  - Estimated completion is November 2023
  - Will include any GI registry items created as a result of developments in Ed. 2.2.0
- S-102 Edition 3.0.0 (Operational)
  - Estimated completion is April 2024
- Medium Risk to not meeting 2024 Edition 3.0.0 publication date



## IHO S-102 PROJECT TEAM UPDATE [D.6]

- HSSC15 to note the progress of S-102 towards an operational edition 3.0.0
- HSSC15 to allocate a new product specification number for non-navigation system bathymetry



# S-129 UNDER KEEL CLEARANCE MANAGEMENT – PROGRESS TO DATE [D.7]

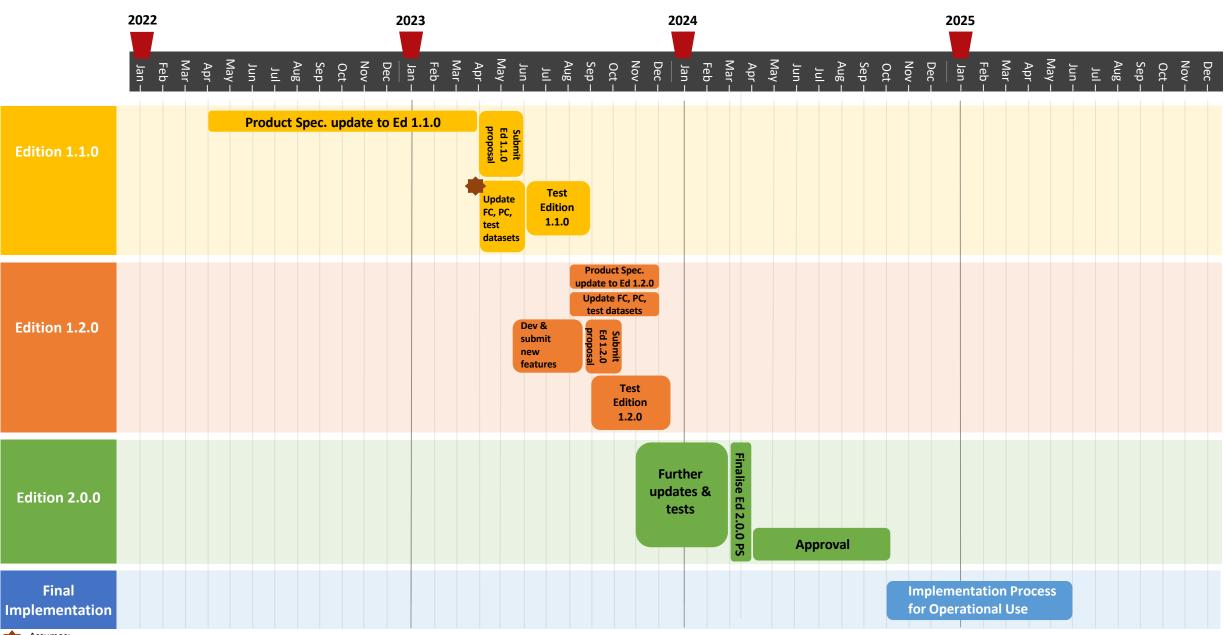
Month	Description
Jun 2019	S-129 Edition 1.0.0 published for implementation and testing
Jun – Sep 2019	Testing (KHOA)
Jun-Aug 2020	Testing (NIWC)
Aug 2020	FC & PC revised (KHOA, KRISO)
Oct 2020 – May 2021	Testing (NIWC) – issues found (particularly w/ PC & XSLT files)
	(Further development and testing on hold until S-100 Ed. 5.0.0)
Dec 2021	S-129 Operational Tests, as part of S-100 Demonstrator Project
Mar 2022	S-129 Project Team meeting no. 5
Mar-Dec 2022	Commenced revision of S-129 Edition 1.0.0 Product Specification
Dec 2022	S-129 Project Team meeting no. 6
Dec 2022 - Present	S-129 Edition 1.1.0 draft and change proposal in progress



# S-129 UNDER KEEL CLEARANCE MANAGEMENT – PROGRESS TO DATE [D.7]

Month	Description
Late May 2023	Complete draft S-129 PS Edition 1.1.0
	Update S-129 FC & PC to Edition 1.1.0
	Project Team meeting to discuss proposed "UKC service area" feature (+ "UKC non-assessed area" feature) (with plan to implement these as S-129 PS Edition 1.2.0)
Jun-Aug 2023	Test Edition 1.1.0 Submit proposals for "UKC service area" (& "UKC non-assessed area") in IHO GI Registry
Aug-Dec 2023	Develop & test S-129 Edition 1.2.0
Dec 2023 – Feb 2024	Further development/updates & testing as needed (further revisions if necessary)
Feb 2024 onward	Develop Edition 2.0.0

#### S-129 Plan Timeline



Assumes

(1) Reliance on S-100 Toolkit Launcher

(2) New S-100 Toolkit Launcher being released early 2023



#### **S-129 DEPENDENCIES AND CHALLENGES**

- Availability of updated/added capabilities in S-100 Toolkit
  - > To update S-129 FC & PC, with minimal reliance on "hand making"
- Availability of testing effort to test & validate new S-129 revisions/editions
- New feature proposals being accepted in IHO GI Registry
- Medium Risk to not meeting 2024 Edition 2.0.0 publication date



## S-129 UNDER KEEL CLEARANCE MANAGEMENT – PROGRESS TO DATE [D.7]

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> HSSC15 to note the progress of S-129 towards an operational edition 2.0.0



#### S-100 OPEN ONLINE PLATFORM PROJECT

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## Building blocks and 4 Themes

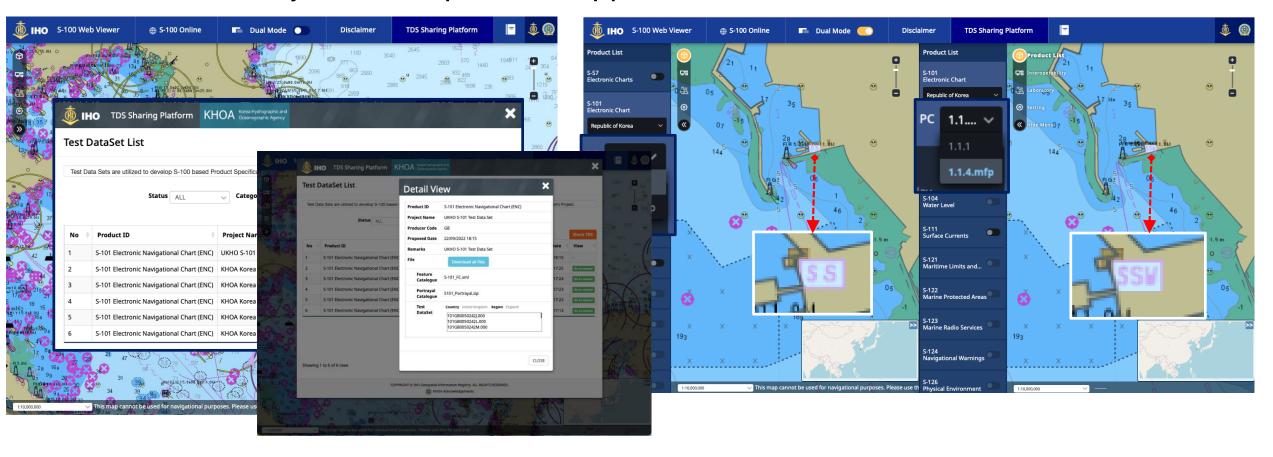
No.	Title	Themes	Actions for short term	Activitiy Tools (Working Place)
1	GI Registry	- <b>Theme 1</b> - Online Viewer and Simulation	<ul> <li>Members produce TDS described in the S-100 implementation roadmap</li> <li>Share the TDS via GI Registry and Web Viewer</li> </ul>	Web Viewer
2	Test Datasets			
3	<b>Production Tools</b>	- <b>Theme 2</b> - Data production and Protection scheme	<ul> <li>Identify what tools are required to product and service S-100 products</li> <li>Investigate which tools are available</li> <li>Gather available tools and links to access</li> <li>Write wiki to record the status and changes of tools</li> </ul>	Wiki
4	<b>Validation Tools</b>			
5	Storage Tools			
6	<b>Protection Tools</b>			
7	<b>Dissemination Tools</b>			
8	Data viewer	- <b>Theme 3</b> - Open source management and Operation	<ul> <li>Prepare open source for S-100 Viewer</li> <li>Improve the open source for the purpose of shore based ECDIS</li> <li>Operate and mange the open source</li> </ul>	Gitub
9	Knowledge Base	- <b>Theme 4</b> - Knowledge base and Capacity building	<ul> <li>Hold a webinar</li> <li>Develop input and requirements to submit to S-100 and PS developers</li> </ul>	Online meetings by VTC
10	Capacity Building			



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#### S-100 OPEN ONLINE PLATFORM PROJECT

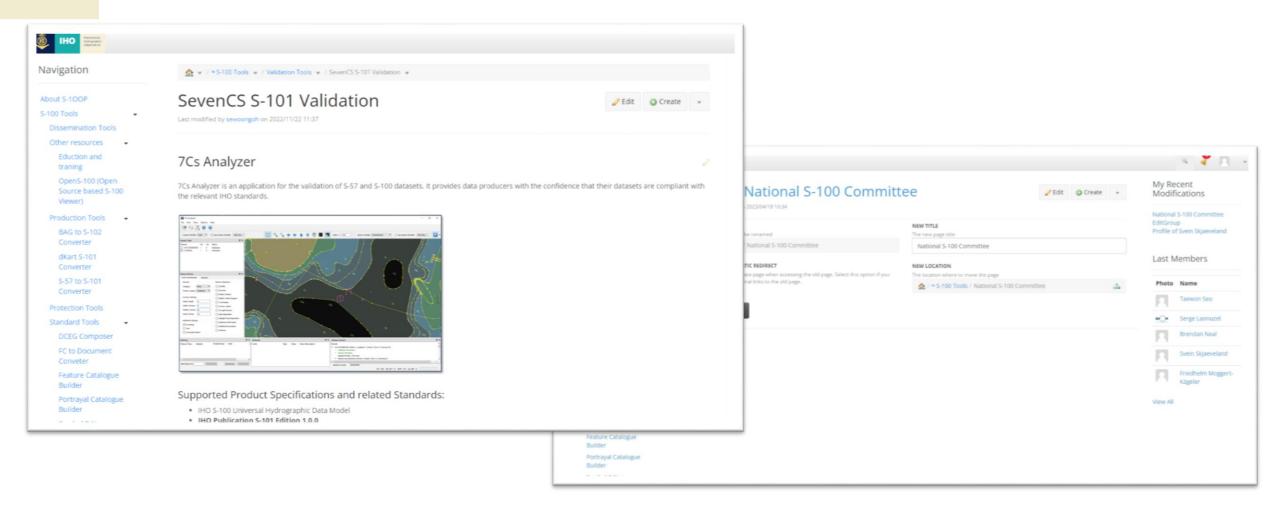
- S-100 Web Viewer-TDS Sharing (Theme 1)
  - Support for S-100 test dataset Web display
  - Support to download(selective function) with TDS meta information
  - Symbol comparison support with different S-101 ENC PC versions





#### S-100 OPEN ONLINE PLATFORM PROJECT

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#### S-100 WORKING GROUP PRIORITY LIST – 2022-2023

- 1. Working towards S-164 Edition 2.0.0
- 2. Correcting and Clarifying S-100 as we get deeper into implementation
- 3. Continue to progress S-101 towards edition 2.0.0
- 4. S-100 Validation Checks
- 5. Continue to move S-102 and S-129 towards an operational editions



#### **ACTIONS REQUESTED OF HSSC15**

- HSSC15 is requested to approve S-100 Edition 5.1.0 and forward it to MS via Circular Letter for Approval
- HSSC15 is requested to approve Edition 1.0.0 of S-164 for initial implementation, testing and evaluation
- HSSC15 is requested to allocate a new number (eg S-158) for S-100 level validation checks (including S-98)
- HSSC15 to consider updating the Roadmap to use Phase 1 and Phase 2 rather than Route Monitoring and Route Planning



#### **ACTIONS REQUESTED OF HSSC15**

- HSSC15 to note the progress of S-102 towards an operational edition 3.0.0
- HSSC15 to allocate a new product specification number for non-navigation system bathymetry
- HSSC15 to note the progress of S-129 towards an operational edition 2.0.0



# Thank You!

