

# Hydrographic Services and Standards Committee

## Report of the S-100WG



# Principal activities and achievements

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- Maintain and Extend S-100 (A.1)
  - Edition 3.0.0 published in June 2017
  - Recommend establishing a timeline for publication cycle of S100
    - Publish every 2 years a new minor or major edition of S-100



# Principal activities and achievements

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- Maintain and Extend S-100 (A.1)

Month/Year	Action	Notes
April 2018	Final Consideration of proposals for the next edition of S-100	S100WG3
May 2018	Notification to HSSC10 of a new edition of S-100	
Early 2019	Publication of next edition of S-100	Edition 4.0.0 (have proposals that extend S-100)
March/April 2020	Final Consideration of proposal for next edition	
May 2020	Notification to HSSC12 of a new edition of S-100	
Early 2021	Publication of the next edition of S-100	



# Principal activities and achievements

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- Maintain and Extend S-100 (A.1)
  - Proposals under currently under consideration
    - Extension of GML to incorporate new geometry – bsplines
    - Incorporation of a scripting language
    - Reworking of the portrayal section to incorporate Lua for use in conditional symbology procedures
    - Standardized set of session oriented services (IALA)
    - Inclusion of data protection



# Principal activities and achievements

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- Maintain and Extend S-100 (A.1)
  - Action Required:
    - HSSC approve the proposed publication cycle of S-100
  - Further recommendation:
    - Currently recommending a two year cycle, but as things become more stabilized recommend moving to a three year cycle



# Principal activities and achievements

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- Development of an S-100 Interoperability Specification(A.2)
  - Completed the initial draft 1.0.0 in August 2017
  - Reviewed at the S-100 Focus Group in September
  - Developed an interoperability catalogue to set machine readable parameters
  - On track for submission to HSSC10



# Principal activities and achievements

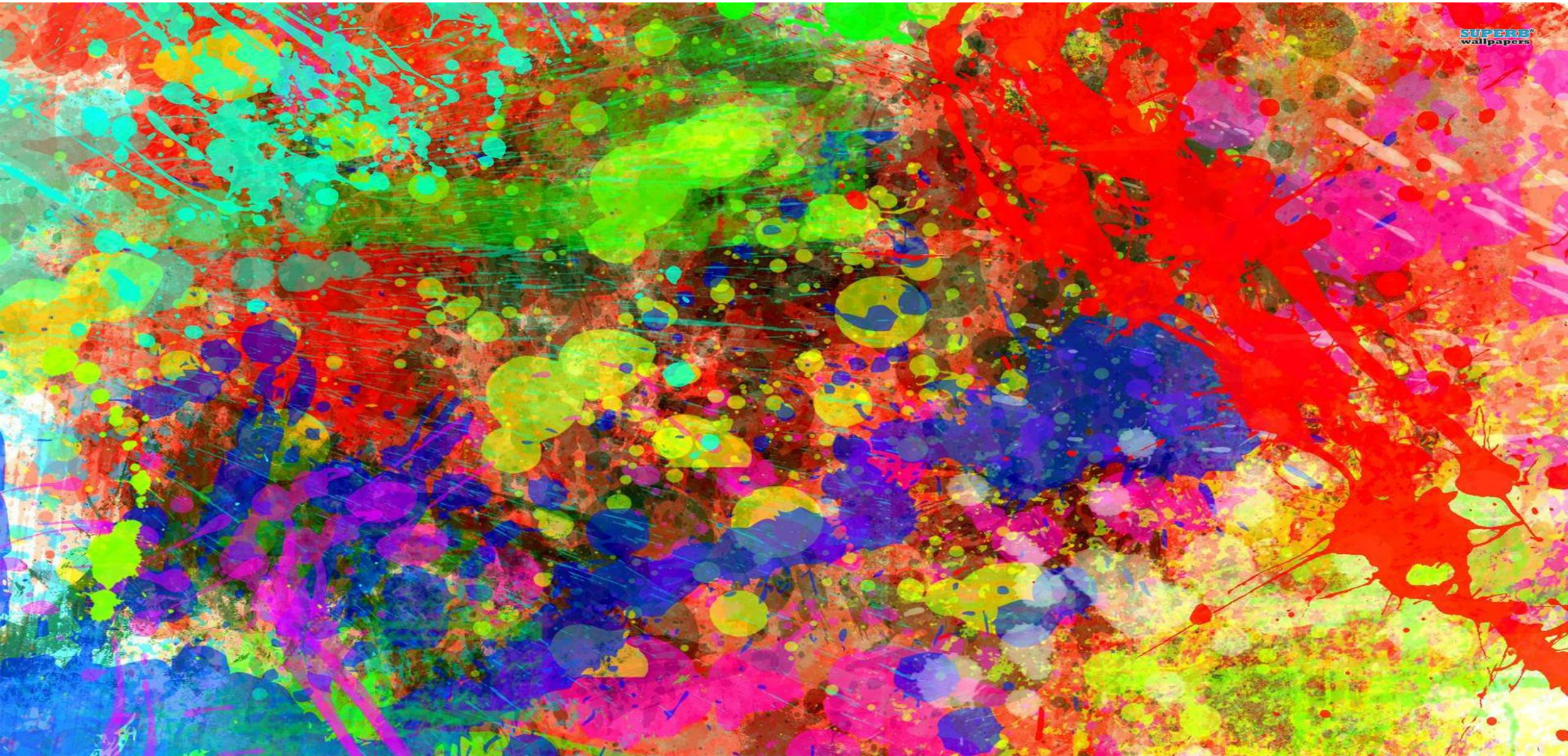
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- Development of an S-100 Interoperability Specification(A.2)





# BAD Interoperability





# Improved Interoperability

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- Takes into account how specifications relate to each other
  - Interleaving of features between products
- Harmonizes Portrayal between products



# Better Interoperability

**Rules Applied**

- Bathymetry no longer goes over the shoreline
- Underlying ENC features are Visible

The screenshot shows the S-100 System software interface. The main window displays a map with bathymetry data overlaid on ENC features. The bathymetry data is shown as a yellow and green shaded area, and the ENC features are shown as black lines and symbols. The map is titled 'S-100 System' and includes a toolbar with various tools such as Zoom In, Zoom Out, and Measure. The LayerManager panel on the left shows a list of layers, and the Attribute List panel on the right shows the attributes of the selected feature. The Feature Information List panel at the bottom shows the coordinates of the selected feature.

No.	Type	Name	On/Off
0	S-101	KR656B01_	On
1	S-101	KR656B02_	On
2	S-102	C:\W_ICW_ALLWS-102\W01	On
3	S-102	C:\W_ICW_ALLWS-102\W02	On
4	S-102	C:\W_ICW_ALLWS-102\W03	On
5	S-111	C:\W_ICW_ALLWS-111\WKR...	On

Data Set Identification	
Encoding specification	S-100 Part 10a
Encoding specificati...	1.1
Product identifier	INT.IHO.S-101.1
Product edition	1.0
Application profile	1
Dataset file identifier	KR656B02_
Dataset title	KR656B02_
Dataset reference date	20170804
Dataset language	EN
Dataset abstract	omitted
Dataset edition	1
A set of topic catego...	14
A set of topic catego...	18

Data Set Structure Information	
Dataset Coordinate ...	0.000000
Dataset Coordinate ...	0.000000
Dataset Coordinate ...	0.000000
Dataset Coordinate ...	0.000000



# Principal activities and achievements

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- Development of an S-100 Interoperability Specification(A.2)
  - Action Required:
    - HSSC assign a S-100 product specification number to the S-100 Interoperability Specification



# Principal activities and achievements

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- Develop the protection scheme (S-63 equivalent component, S-100 Part 14) of S-100 based products (A.3)
  - Work is ongoing and expected to be published as part of edition 4.0.0 in 2019
  - Limited resources



# Principal activities and achievements

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- Maintain and Extend the S-99 “Operational Procedures for the Organization and Management of the S-100 GI Registry” (B.1)
  - Action HSSC6/16 has not been completed due to other pressing S-100 registry infrastructure issues
  - **Still not completed.**





# Principal activities and achievements

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- Maintain and Extend the S-99 “Operational Procedures for the Organization and Management of the S-100 GI Registry” (B.1)
  - **Recommend that this workplan item be moved to HSSC**
    - The management should be at a higher level than the S100WG as S-100 is utilized by multiple IHO working groups and other liaison organizations



# Principal activities and achievements

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- Maintain and Extend the S-99 “Operational Procedures for the Organization and Management of the S-100 GI Registry” (B.1)
  - **ACTION REQUIRED:** HSSC9 add the Maintenance of S-99 to the HSSC Workplan and the S-100WG renames B.1 to implement the technical aspects of S-99 for the management of the S-100 GI Registry



# Principal activities and achievements

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- Establish a cross-domain Control Body and an Executive Control Body for the IHO Registry and an Expert Group for the Hydro Domain (B.2)
  - Due to limited time on the chairs part not much was accomplished
    - Presented the concept of the expert group for the hydro domain
      - Comprised of equal membership between the S-101 project team and NIPWG



# Principal activities and achievements

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- Establish a cross-domain Control Body and an Executive Control Body for the IHO Registry and an Expert Group for the Hydro Domain (B.2)
  - Chair recommends that this item be transferred to the HSSC workplan
    - Control body and executive control body are comprised of members from different working groups under HSSC
    - Management should be at a higher level
    - S100WG would continue to remain responsible for the technical aspects of the GI registry and the maintenance of the underlying models



# Principal activities and achievements

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- Establish a cross-domain Control Body and an Executive Control Body for the IHO Registry and an Expert Group for the Hydro Domain (B.2)
  - **ACTION REQUIRED: HSSC9 add the establishment of a cross-domain Control Body and Executive Control body to the HSSC workplan and remove the item from the S-100WG.**
    - Note: It is recommended that this function be added to the IHO Register Manager's portfolio.
  - B.2 should then read as follows:
  - *B.2 Establish and maintain an expert group for the hydro domain.*





# Principal activities and achievements

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- Update the S-100 GI Register to edition 2.0.0 (3.0.0) and re-build the web interfaces (C.1)
- ROK continues to maintain and enhance the S-100 GI Registry.
  - Enhancements underway to include a mechanism for registering product specifications and testing draft versions of product specifications



# Principal activities and achievements

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- Connect the S-100 Feature Catalogue Builder to the S-100 GI Register (C.2)
- Work is completed
- Working with ROK on how to make the FCB available to product specification developers



# Principal activities and achievements

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- Develop web-interfaces to propose new symbology to the S-100 Portrayal Register (C.3)
- Work on the proposal mechanism system has been completed
  - Still need to test the new interfaces



# S-100 Infrastructure

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- [S-100 Infrastructure Update](#)



# Principal activities and achievements

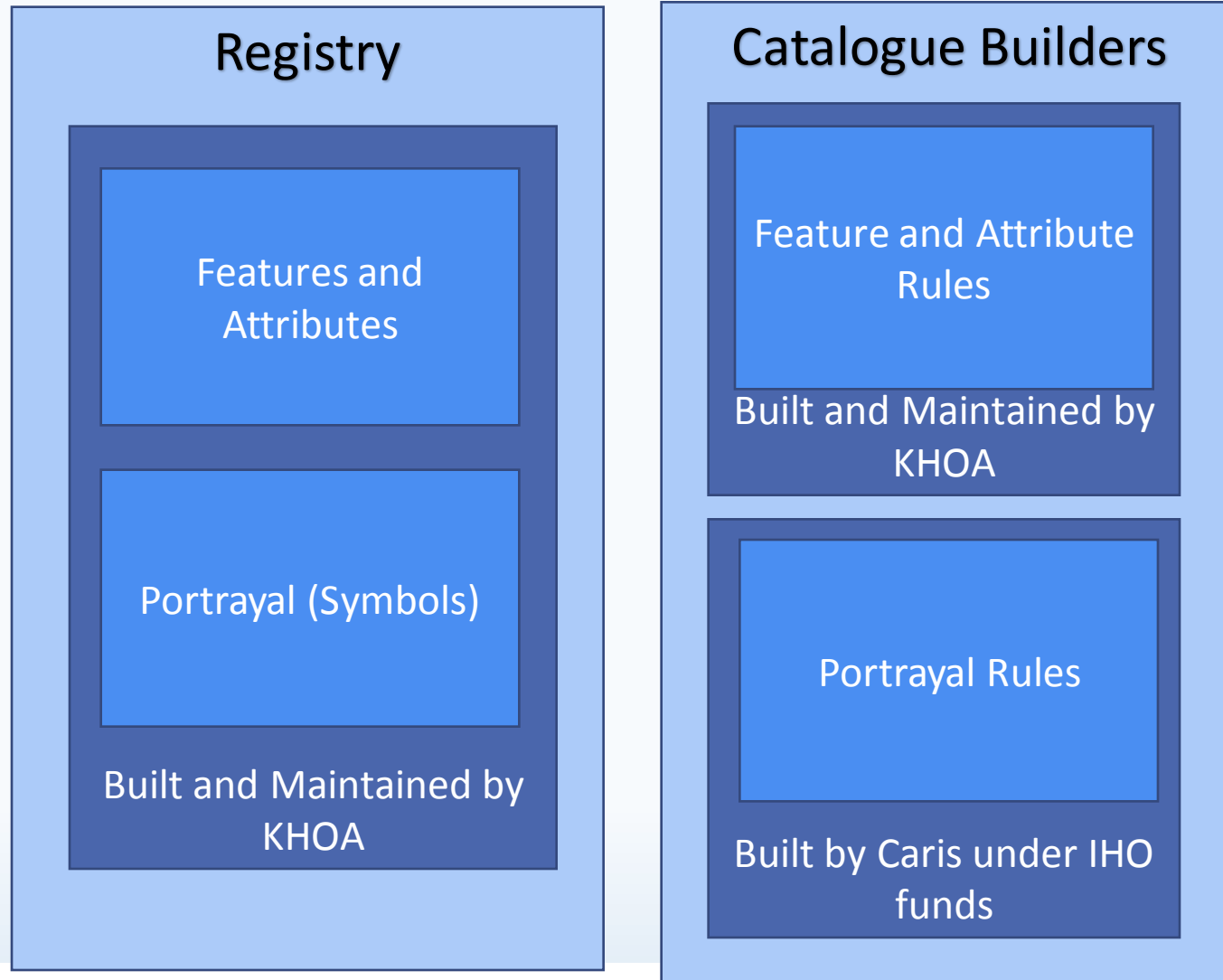
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- Update and Maintain the Portrayal Catalogue Builder(C.4)
  - Spent most of 2017 setting up and establishing the connections
  - Still has not been utilized to build a portrayal catalogue for ANY product specifications
  - **ACTION REQUIRED:** Utilize IHO Special Project funds to build the first iteration of the S-101 portrayal catalogue and potential fixes and enhancements to the PCB
  - **HSSC9-05.1B requests \$33,000 for PCB updates and building the S-101 portrayal catalogue**

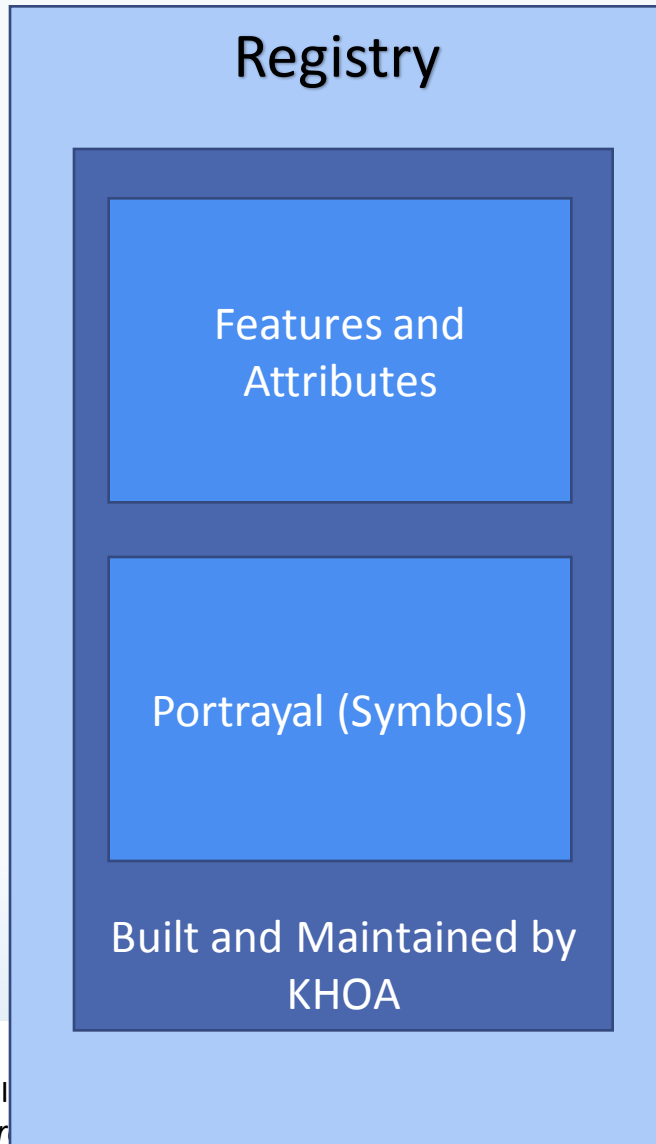




# S-100 Infrastructure



# S-100 Infrastructure Gaps– Portrayal Catalogue Builder



- Needs practical use by PS developers
- S-101 needs to use the PCB
  - Version control of the catalogs
- LUA functionality needs to be implemented
- General bug fixes



# Principal activities and achievements

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- Update and Maintain the Portrayal Catalogue Builder(C.4)
  - **ACTION REQUIRED:** Utilize IHO Special Project funds to build the first iteration of the S-101 portrayal catalogue and potential fixes and enhancements to the PCB
  - HSSC9-05.1B requests \$33,000 for PCB updates
    - LUA implementation
    - Bug fixes
    - Build the S-101 portrayal catalogue

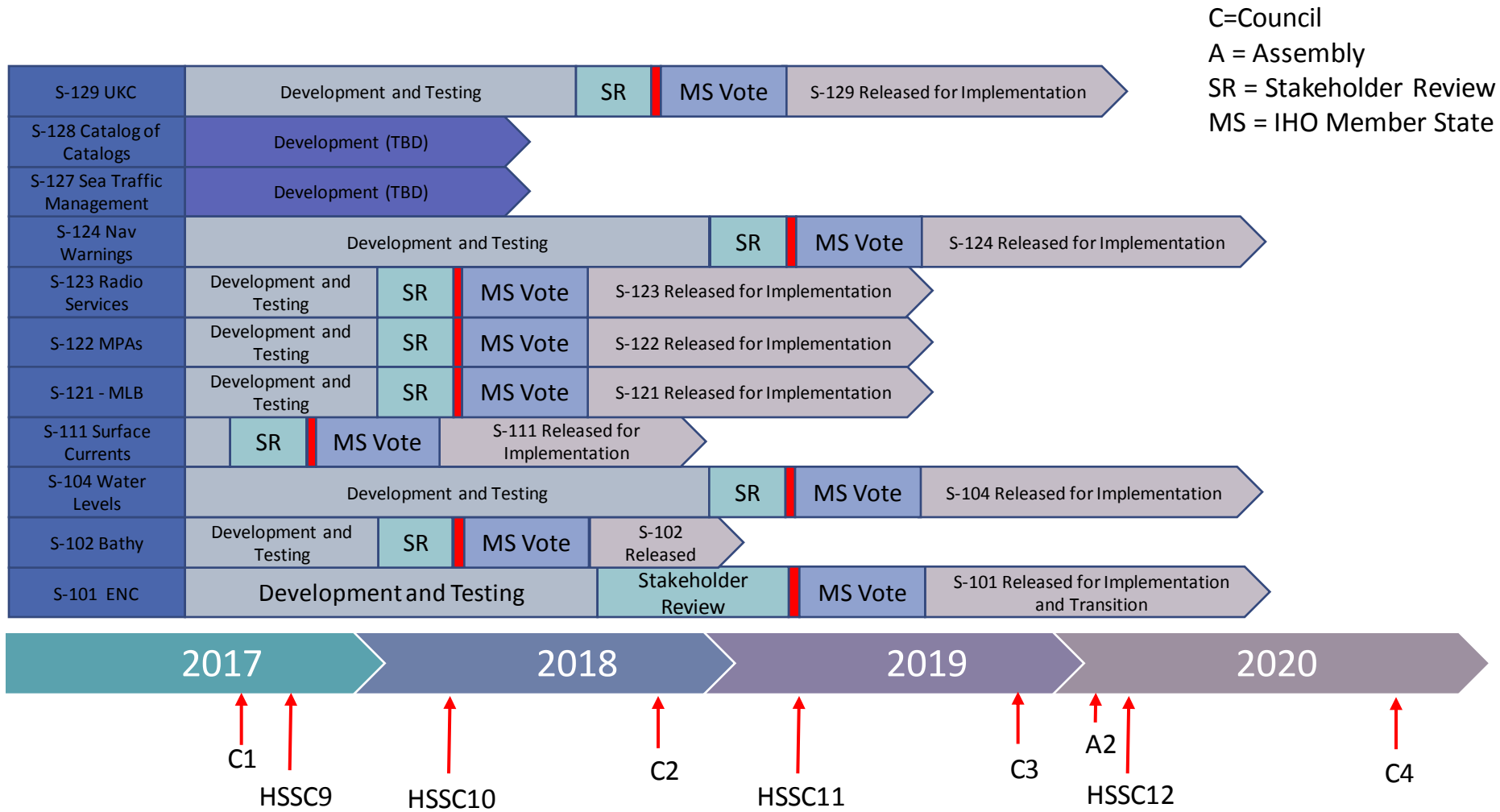


# Principal activities and achievements

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- Review the S-100 Master Plan Annually (D.1)
  - S-100WG did not do a comprehensive review of the S-100 master plan in 2017
  - Will perform a holistic review in 2018 for HSSC10
  - Would like to include a roll out plan for various product specification that are under development
    - Identifies the challenges and potential mitigation strategies







# Principal activities and achievements

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- Review the S-100 Master Plan Annually (D.1)
  - Recommend revamping the S-100 page of the IHO website to include a repository for different product specifications under development
  - Provides a one-stop shop for implementers to find the information that they need



# Principle activities and achievements

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- Review the S-101 Value Added Roadmap (D.2)
- No recommended changes at this time



# Principal activities and achievements

- S-101 ENC Product Specification (D.3)

S-101 Component	Current Status	Comment
Main Document	Testing Baseline – June 2015	<ul style="list-style-type: none"> <li>• Sent out for stakeholder review in September 2014 and final comments incorporated into the testing baseline</li> </ul>
Data Classification and Encoding Guide	Baselined – June 2016	
8211 Annex	Testing Baseline – June 2015	<ul style="list-style-type: none"> <li>• New Items have been registered in the GI Registry.</li> <li>• Changes to the DCEG will undergo a controlled proposal process in order to manage change effectively.</li> </ul>
Feature Catalogue	Testing Baseline – June 2015	<ul style="list-style-type: none"> <li>• Awaiting the FCB connection to the GI Registry to create a new version that contains the new DCEG items.</li> </ul>
Portrayal Catalogue	Partial Baseline – July 2015	<ul style="list-style-type: none"> <li>• Caris has created a partial portrayal catalogue using the elements from S-52 in the S-100 format.</li> <li>• There is still more work to be done once the S-100 Register is operational.</li> <li>• NOAA has funded work on baselining the S-52 CSPs into XSLT 1.0 that will be part of the Portrayal Catalogue</li> </ul>
Implementation Guidance	In Progress	Will continue to be refined during the S-101 test bed process
Validation Checks	In Progress	<ul style="list-style-type: none"> <li>• Denmark has taken the lead to develop the S-101 Validation Checks</li> </ul>



# Principal activities and achievements

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- S-101 ENC Product Specification (D.3)



# Principal activities and achievements

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- S-101 ENC Product Specification (D.3)
  - Lack of resources
  - Project Team leader has had a position change in their home organization and does not have the time to progress S-101 forward
  - **ACTION REQUIRED: Member States consider nominating a new S-101 Project Team Lead**
  - **Completed – NGA has volunteered Al Armstrong**



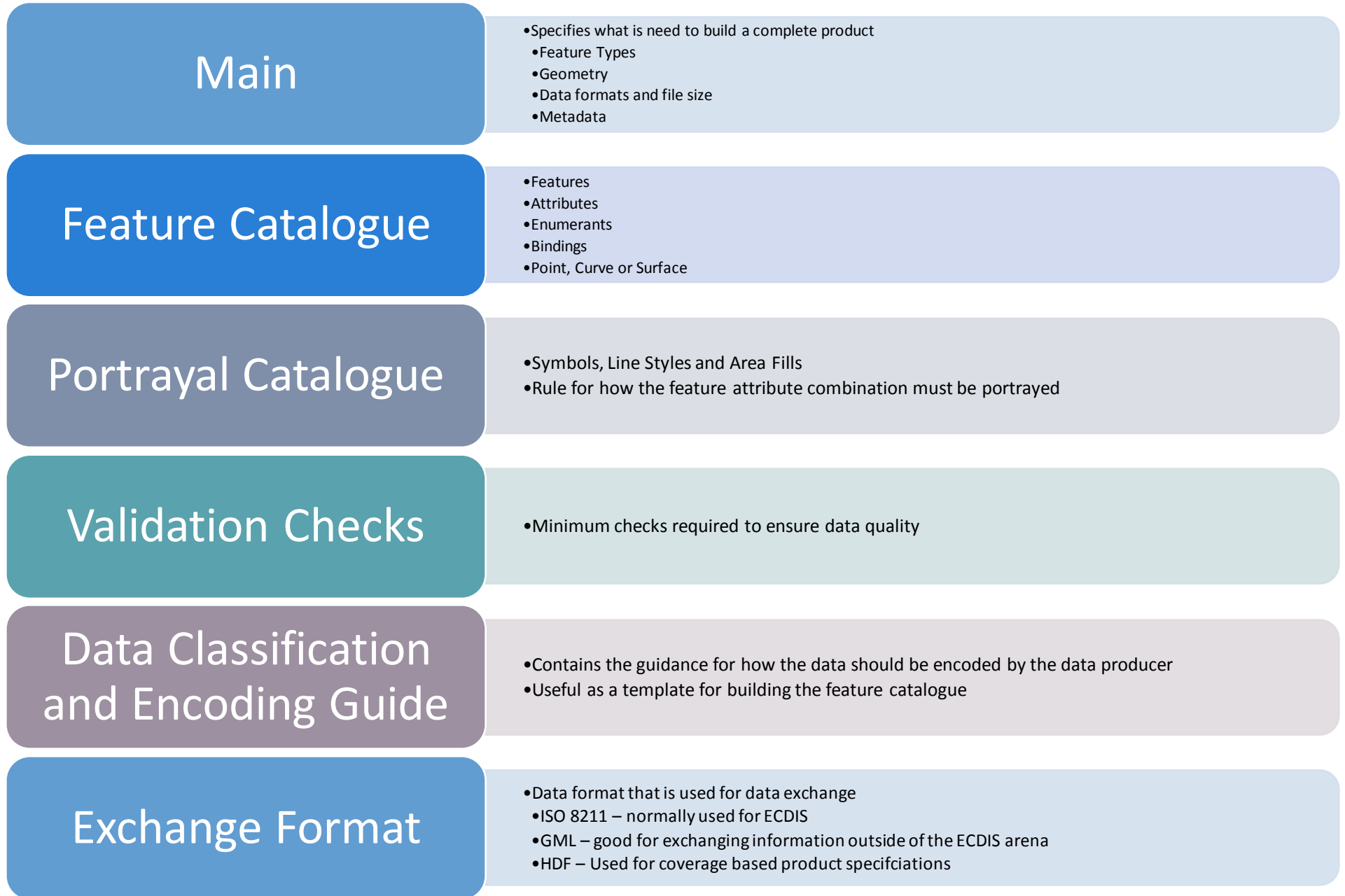
# Principal activities and achievements

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- S-101 ENC Product Specification (D.3)
  - Planned Activities
  - Hold a separate S-101 project team meeting in June
    - Aim to produce Edition 1.0.0 for test and implementation
    - Shake out many of the issues
    - Need the assistance of the IHO to build the initial portrayal catalogue
    - Note: S-101 will utilize the Lua portrayal mechanism rather than XSLT
      - Will require an update to the PCB
      - S-100 will require an update to accommodate this methodology



# Components of an S-100 Product Specification



# Path forward for S-101 Edition 1.0.0 and beyond

Components	Edition 1.0.0 (2018)	Edition 2.0.0 (2019)	Edition 3.0.0 (2020)
Main Documentation	✓	✓	✓
Feature Catalogue	✓	✓	✓
Portrayal Catalogue	Partial	✓	✓
Validation	Partial	✓	✓
Data Classification and Encoding Guide	✓	✓	✓
Encoding Format	✓	✓	✓
Encryption		✓	✓
<b>Notes</b>	Portrayal will be limited to S-52 rules translated to LUA	Edition 2.0.0 refines all the additional rules	<b>Operational Edition</b>





# Principal activities and achievements

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- Monitor the implementation of the 1<sup>st</sup> draft of the S-101 Specification (D.4)
  - Planned
- Develop an S-100/S-101 Test Strategy and Test Bed (D.5)
  - Much of this years effort was spent on the S-100 Interoperability specification



# Progress on the S-100 Test bed

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- [Presentation on the S-100 Test Bed](#)



# Principal activities and achievements

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- S-102 (D.8)
  - Finalizing how S-102 data will be portrayed
  - Potential inclusion of variable resolution grids
  - Developing a script to convert BAG to an S-102 compliant dataset
  - New Target
    - ~~HSSC9~~
    - HSSC10



# Principal activities and achievements

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- Develop a Product Specification for Under Keel Clearance Management Information (D.7)
  - Continues to make progress
  - Working on the underlying data model to depict no-go areas and routes with tidal windows on the navigation display derived from calculations of the UKCM
  - Target completion 2018



# Principal activities and achievements

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- Develop S-121 Product Specification for Maritime Limits and Boundaries (D.8)
  - [Link to S-121 PT update](#)



# Principal activities and achievements

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- Develop S-121 Product Specification for Maritime Limits and Boundaries (D.8)
  - Next Steps
    - Full review by the S100WG and the IHO stakeholder community
    - Delivery to HSSC10



# Principal activities and achievements

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- NEW: Establishment of the ENC display subWG (D.9)
  - 12 Member States
  - Work by correspondence
  - Inform portrayal of S-101



# Background

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- Paper “**Improvement of ENC’s display on ECDIS**” ([https://www.iho.int/mtg\\_docs/com\\_wg/S-100WG/S-100WG2/S-100WG2-11.7\\_ENC\\_Display\\_Issues.pdf](https://www.iho.int/mtg_docs/com_wg/S-100WG/S-100WG2/S-100WG2-11.7_ENC_Display_Issues.pdf)) was submitted by France (after feedbacks from French Navy), to the:
  - S-100WG2 and ENCWG2 (March 2017, Genoa) and
  - NCWG3 (May 2017, Redlands)





# Issues Identified

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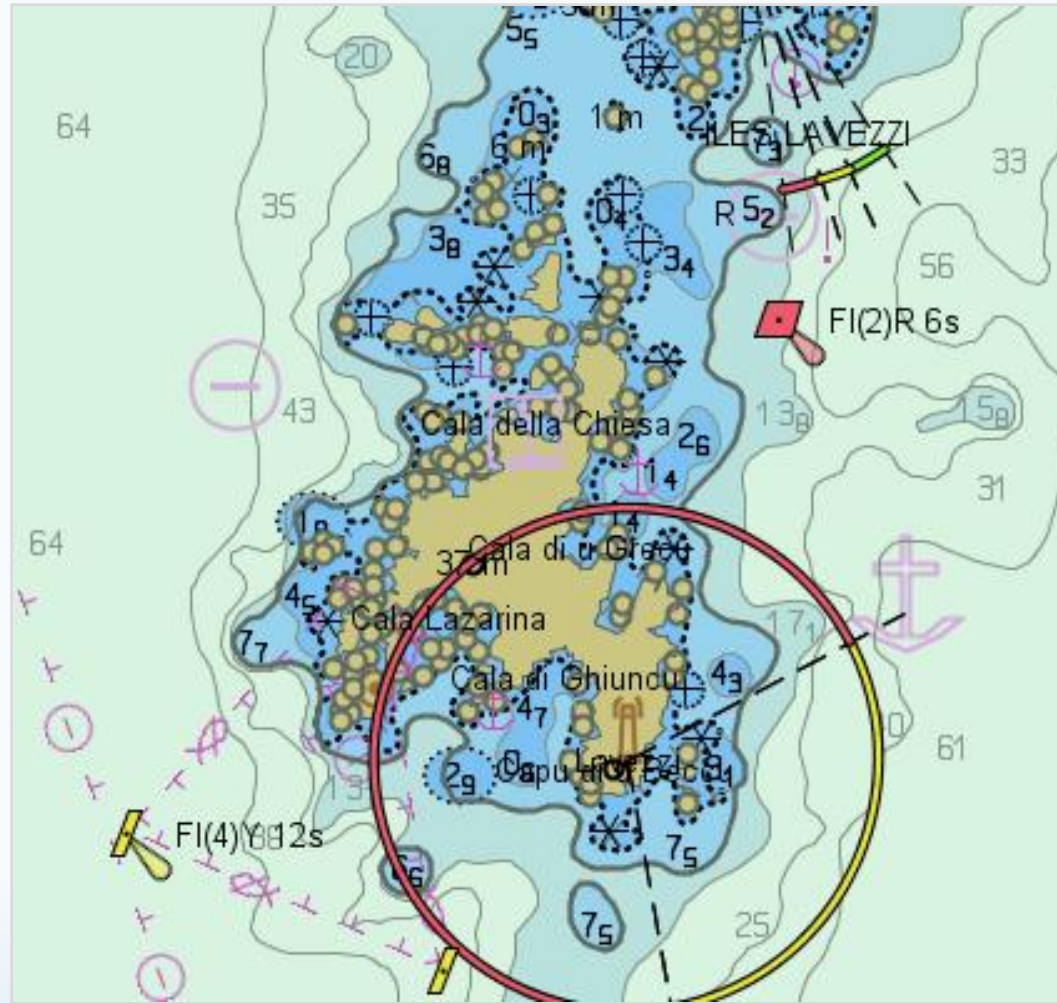
- Choosing the right CSCL for the ENC (vs Paper chart scale),
- SCAMIN and its possible improvement,
- Text display issues,
- S-52 30 years old symbology,
- Up to now, S-101 portrayal is a copy of S-52.

*The paper did not pretend to be exhaustive. Its aim was to show, through some examples that “something should be done”.*



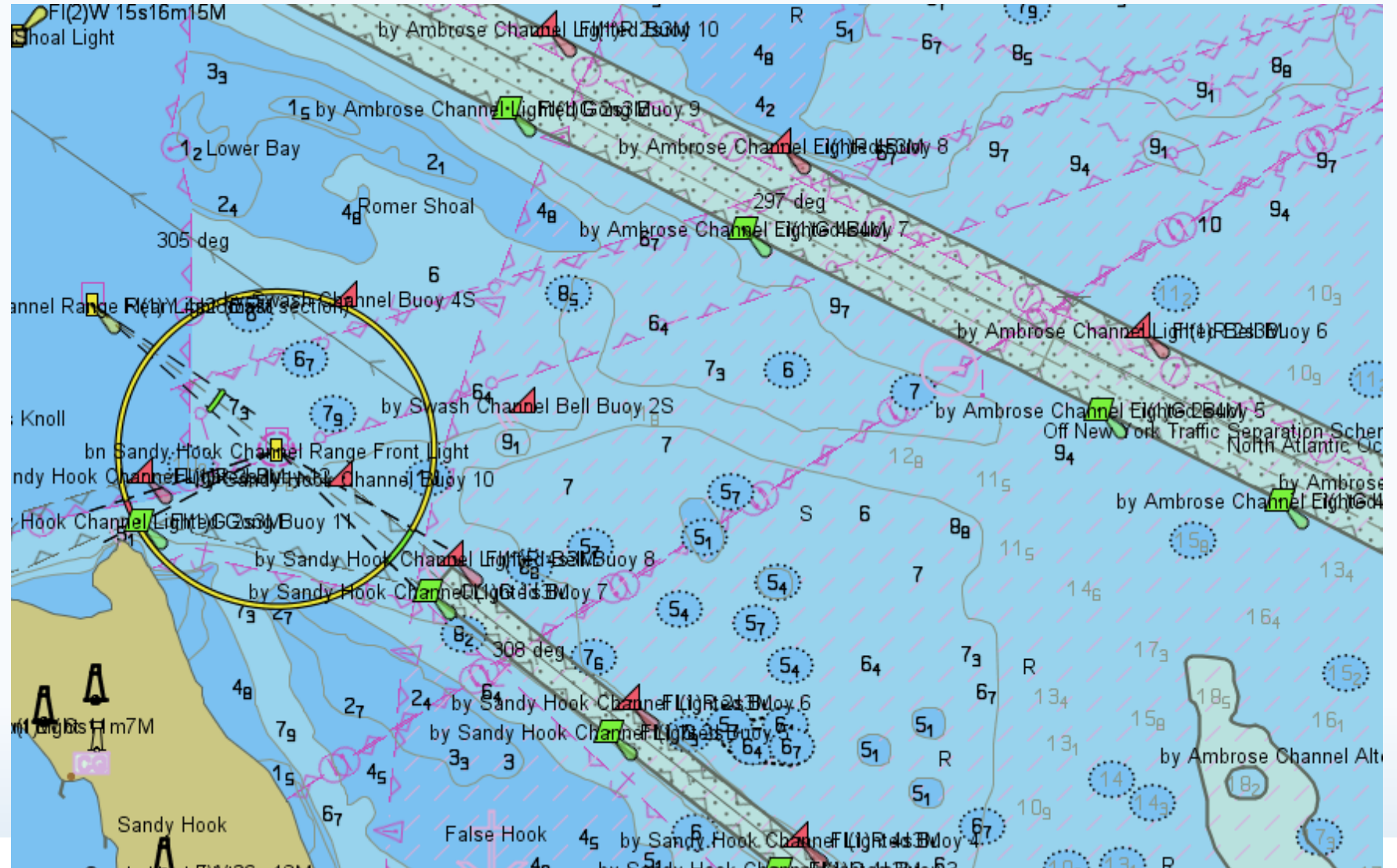
# Issues - Examples

**Over importance of Point Land Areas**



# Issues - Examples

Text clutter



# Recommendations

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- Creation of a Sub WG to:
  - Assess the current ENC display on ECDIS,
  - Draw a list of “issues to solve”,
  - Propose solutions (changes to the standards) and actions for the HSSC WGs (S-100WG, ENCWG and NCWG).



# Actions decided at ENCMWG and S100WG

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- Paper was welcome and recommendations agreed
  - Creation of a “transversal” SubWG, including members from S-100WG, ENCWG and NCWG.
  - Draft roadmap was established (see Annex D in [https://www.iho.int/mtg\\_docs/com\\_wg/ENCWG/ENCWG2/ENCWG2\\_Draft\\_Minutes.pdf](https://www.iho.int/mtg_docs/com_wg/ENCWG/ENCWG2/ENCWG2_Draft_Minutes.pdf))
  - Numerous volunteers to participate.



# ENCDSWG so far

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- Composition: 12 Member States, 8 expert contributors (Rencs, OEMs, IALA, IHO, ...).
- Web Basecamp activated to share files and discussions.
- Inputs and discussions have started.
- Some delay as regard to the draft roadmap **but proposals will be ready for next S-100WG and ENCWG meetings (April 2018).**





# Progress

## ENC Display subWG

[Invite more people](#)  
39 people on this project

[Catch up](#)  
on recent changes

[5 Discussions](#) [4 Files](#) Add the first: [To-do list](#) [Text document](#) [Event](#)

### Latest project updates






- Sep 12 You gave Ronan P. access to the project: ENC Display subWG
- Sep 11 Palle H. commented on [Sub WG Work progress](#)
- Sep 11 You posted a message: [Sub WG Work progress](#)

[See all updates](#)

### Discussions

[Post a new message](#)





[Watch a quick video about Discussions](#)

-  Palle H. [Sub WG Work progress](#) - Dear Christian, Thank you for your input. I'm hoping to find time, very soon, to look into the issues more deeply. I have access to a E-GLOBE software solution ECDIS; I'll Sep 11 [1](#)
-  thomas.richardson... [ENC Display subWG Participants.xls](#) - Christian, Please can you add me to the IC-ENC listing. Aug 25 [2](#)
-  thomas.richardson... [Examples of Display Issues in ECDIS - Norwegian...](#) - Dear All, Please find attached a document with further comments from IC-ENC. Best Regards, Tom Richardson IC-ENC Aug 25 [3](#)
-  Christian M. [Now we can start!](#) - Thanks a lot to Odd and Alvaro for initiating the effective work of this subWG. The examples can be provided in any format. PDF such as Odd's file is convenient as Jul 27 [1](#)
-  Carlo M. [partecipants](#) - Hi Christian, I wrote you several times via e-mail, but the system rejected my mail... could you please add the following members to the list?: Tirone Cristina - May 3 [1](#)

### Files

[Add files](#)

[Watch a quick video about Files](#)

 <b>ENC Display subWG Participants.xls</b> Added by Christian M. on Aug 25 - 42 KB <a href="#">Label...</a>	 <b>20170825-Comments on Norwegian ECDIS Display Paper IC-ENC.docx</b> Added by thomas.richardson@ic-enc.org on Aug 25 - 16 KB <a href="#">3 comments</a> <a href="#">Label...</a>	 <b>Issues_possible_solutions.xls</b> Added by Christian M. on Jul 27 - 34 KB <a href="#">Label...</a>
 <b>NHS-examples_Maris-ECDIS_20072017.pdf</b> Added by Odd Aage F. on Jul 20 - 2 MB <a href="#">3 comments</a> <a href="#">Label...</a>		



# Principal activities and achievements

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- NEW: Establishment of the ENC display subWG (D.9)
- **ACTION REQUIRED:** HSSC approve the establishment of “transversal” ENC Display subWG to concentrate on the improvement of ENC display and establish ToRs for this subWG.





# Principal activities and achievements

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- Liaison Activities
  - Continue to liase
- IALA
  - Continued collaboration
    - Accepted proposals on session oriented services and marine resource identifiers
    - S100 will adopt the Marine Resource Identifier concept
    - **ACTION REQUIRED: HSSC task the IHO to register to the um:mm:iho name space and task the S100WG to establish a management process for the namespace once it has been registered.**



# Principal activities and achievements

- Progress on HSSC Action Items

AGENDA ITEM	SUBJECT	ACTION No.	ACTIONS (in bold, action by)	TARGET DATE/EVENT	STATUS (at 18 August 2017)
<b>3. Matters arising from Minutes of 7th HSSC Meeting</b>					
	E-navigation implementation	HSSC8/05 (Former HSSC7/37)	ENCWG and S-100WG to monitor any possible impact of the work on the agreed e-navigation outputs on ECDIS related standards and S-100 related standards respectively.		On-going
<b>4. HSSC Administration</b>					
<b>5. Reports by HSSC Working Groups</b>					
<b>5.1 S-100 (S-100WG)</b>					
		HSSC8/11	HSSC endorsed the draft Edition 3.0.0 of S-100. S-100WG Chair to provide a redline version and a clean copy to the IHO Secretariat. IHO Sec. to issue a CL to IHO Member States seeking their approval of the draft Edition 3.0.0 of S-100.	15 Dec. 2016  End of Dec. 2016	Decision  DONE (IHO CL 15/2017 & CL 32/2017)



		HSSC8/12	IHO Sec. in liaison with S-100WG to promote the operational status of the IHO S-100 Registry.	End of Dec. 2016	On going
		HSSC8/13	HSSC invited KHOA to consider supporting further development of S-100 Registers (Product Spec. and Data Producer Code Registers) and stabilization of the Feature Concept Dictionary and Portrayal Registers.	Dec. 2016	On going
		HSSC8/14	HSSC decided to establish: <ul style="list-style-type: none"> <li>- a Cross-Domain Control Body and an Executive Control Body for the IHO Registry,</li> <li>- and an Expert Group for the HYDRO domain,</li> </ul>		Decision  See 2.3 of the S100WG Reoport
			and invited the S-100WG to propose their membership and TORs accordingly.	HSSC-9	
		HSSC8/15	S-100WG, NIPWG to submit formal requests to the IHO Sec., through the HSSC Chair, for financial support from the IHO special project fund for the relevant items of their respective work plans.	NIPWG-3, S-100WG-2	DONE for NIPWG  On-going for S-100WG
		HSSC8/16	HSSC requested the S-121 Project Team (Maritime Limits and Boundaries) to abide by its TORs and the current work plan agreed at HSSC-7, and to submit a draft Product Spec. for consideration by the S-100WG (by end of March 2017). Extension of the Product Spec. to be considered in the future, after approval of Ed. 1.0.0 of S-121 (Maritime Limits and Boundaries).	Report to HSSC-9	On-going – New target HSSC10
		HSSC8/17	HSSC allocated S-129 to the Product Spec. on Under Keel Clearance Management (UKCM) information and invited INTERTANKO to participate in the UKCM PT.		Decision  Completed
		HSSC8/18	FR invited to submit a proposal to the S-100WG on using Resource Description Framework (RDF) semantic web standards for further S-100 developments.	S-100WG2 , then report to HSSC-9	DONE
	S-101&IMO Performance Standards	HSSC8/19 (Former HSSC7/06)	S-100WG invited to investigate if S-101 ENC's will meet the current IMO Performance Standards so there is no need to consider proposing amendments to the IMO.	S-100WG2	On-Going
	S-101&IMO Performance Standards	HSSC8/20	HSSC to revisit the discussion on the above issue at an ECDIS/E-navigation Stakeholder Day after NCSR-4, subject to the outcome of the proposal to activate the IMO/IHO Harmonization Group on Data Modelling (HGDM).	HSSC-9	On-going

# Problems or outstanding issues

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- Still working on operationalizing the S-100 Portrayal Catalogue Builder
- Lack of time for the S-101 Project Team Leader



# Action requested of HSSC

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- The HSSC is invited to
  - note this report and approve the continuance of the Work Plan.
- Approve the actions requested with in this report



# Actions Requested of HSSC

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- Action Required: HSSC approve the proposed publication cycle of S-100
- Recommendation: Currently recommending a two year cycle, but as things become more stabilized recommend moving to a three year cycle
- Action Required: HSSC assign a S-100 product specification number to the S-100 Interoperability Specification



# Actions Requested of HSSC

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- **ACTION REQUIRED:** HSSC9 add the Maintenance of S-99 to the HSSC Workplan and the S-100WG renames B.1 to implement the technical aspects of S-99 for the management of the S-100 GI Registry
- **ACTION REQUIRED:** HSSC9 add the establishment of a cross-domain Control Body and Executive Control body to the HSSC workplan and remove the item from the S-100WG.
  - Note: It is recommended that this function be added to the IHO Register Manager's portfolio.
  - B.2 should then read as follows:
  - *B.2 Establish and maintain an expert group for the hydro domain.*



# Actions required of HSSC

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- **ACTION REQUIRED:** Utilize IHO Special Project funds to build the first iteration of the S-101 portrayal catalogue and potential fixes and enhancements to the PCB (ref HSSC9 5.1B)
- **Recommendation:** revamp the S-100 page of the IHO website to include a repository for different product specifications under development





# Actions required of HSSC

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- **ACTION REQUIRED:** Member States consider nominating a new S-101 Project Team Lead
- **ACTION REQUIRED:** HSSC approve the establishment of “transversal” ENC Display subWG to concentrate on the improvement of ENC display and establish ToRs for this subWG.
- **ACTION REQUIRED:** HSSC task the IHO to register to the um:mm:iho name space and task the S100WG to establish a management process for the namespace once it has been registered.

