IC-ENC Working together to assure navigational safety

IC-ENC Update to WENDWG14

IC-ENC

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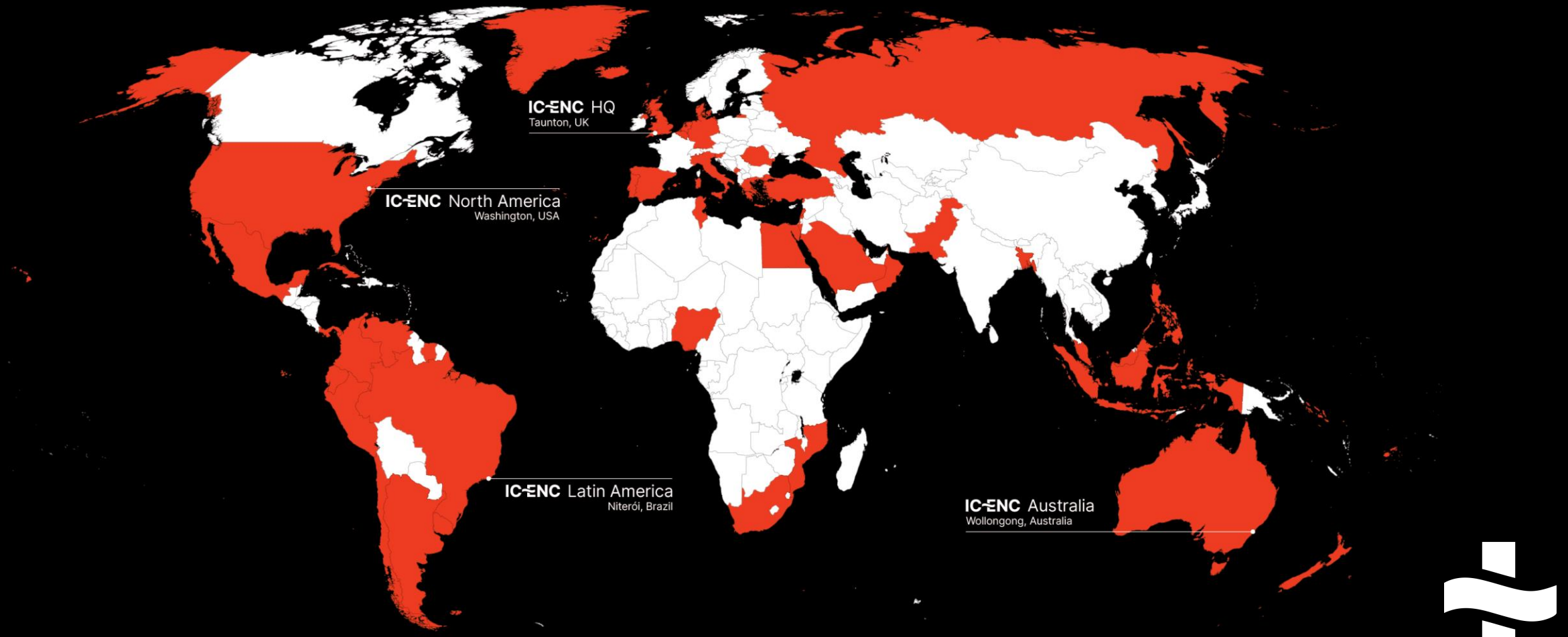
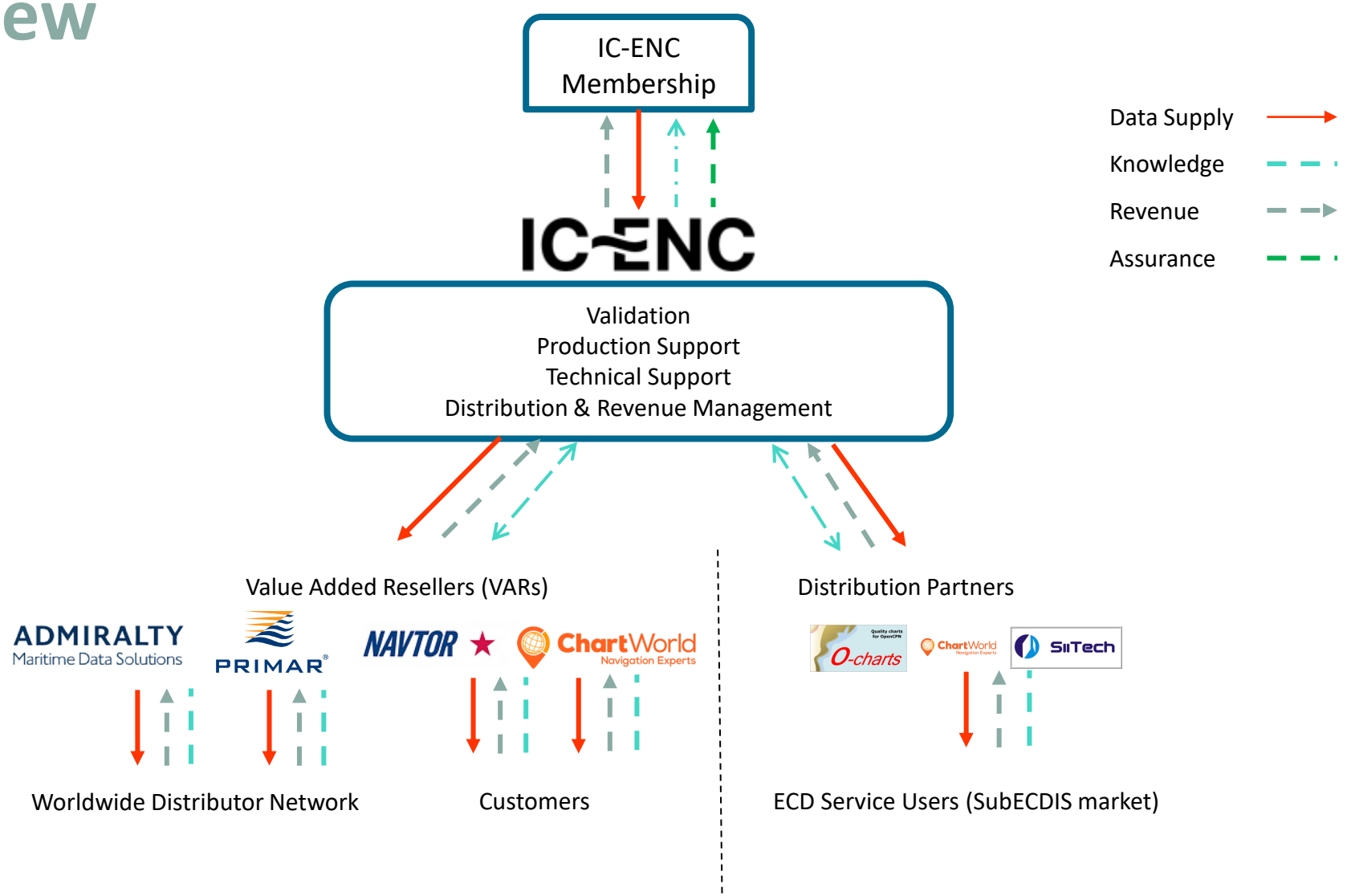
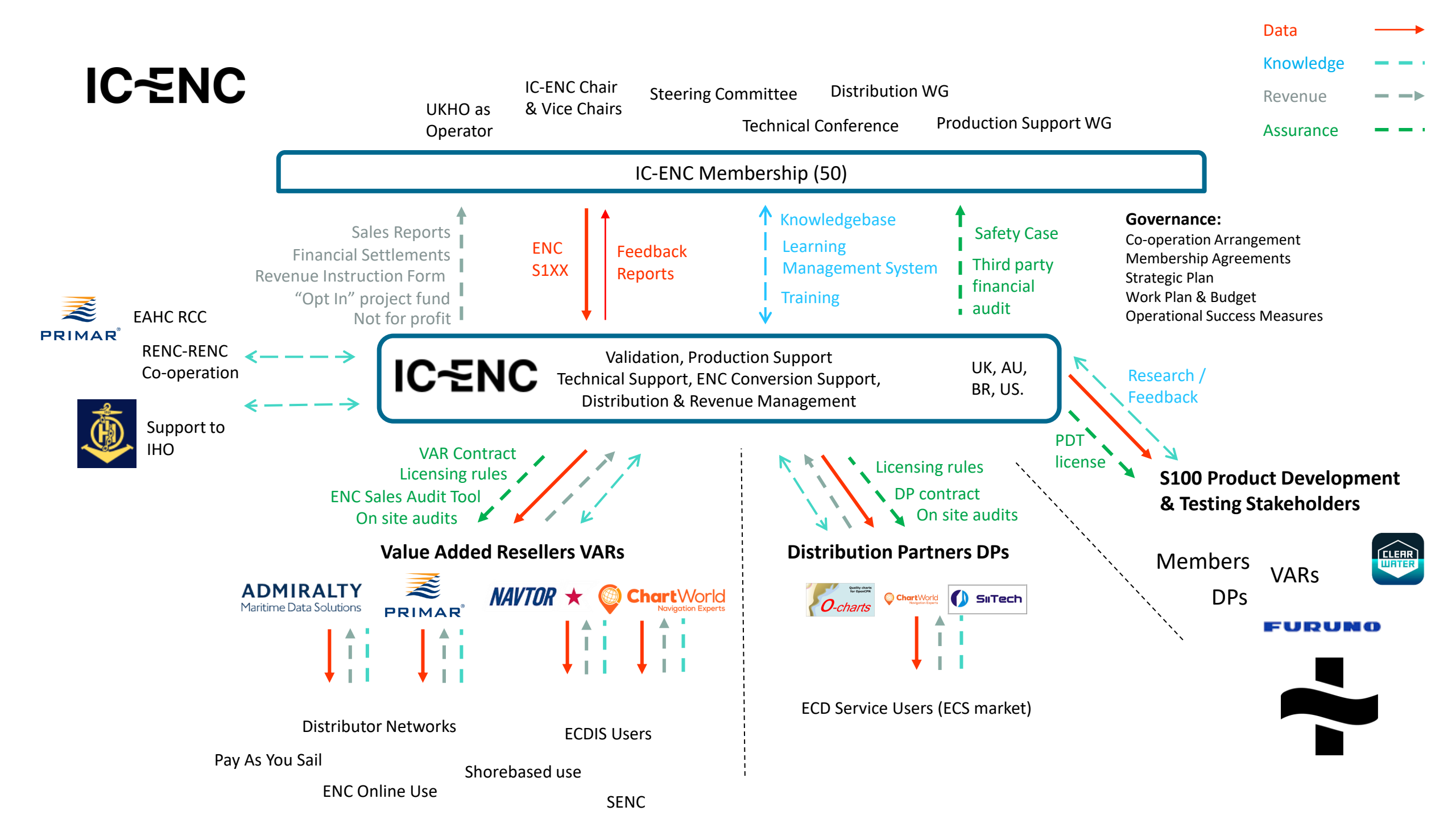
assure navigational safety



IC-ENC

Overview




IC-ENC
UKHO as Operator
IC-ENC Chair & Vice Chairs
Steering Committee
Distribution WG
Technical Conference
Production Support WG
Data
Knowledge
Revenue
Assurance
IC-ENC Membership (50)
Sales Reports
Financial Settlements
Revenue Instruction Form
"Opt In" project fund
Not for profit
ENC
S1XX
Feedback
Reports
Knowledgebase
Learning Management System
Training
Safety Case
Third party financial audit
Governance:
Co-operation Arrangement
Membership Agreements
Strategic Plan
Work Plan & Budget
Operational Success Measures
PRIMAR
EAHC RCC
RENC-RENC Co-operation
Support to IHO
IC-ENC
Validation, Production Support
Technical Support, ENC Conversion Support,
Distribution & Revenue Management
UK, AU, BR, US.
Research / Feedback
PDT license
S100 Product Development & Testing Stakeholders
Members
VARs
DPs
CLEAR WATER
FURUNO
VAR Contract
Licensing rules
ENC Sales Audit Tool
On site audits
Value Added Resellers VARs
ADMIRALTY Maritime Data Solutions
PRIMAR
NAVTOR
ChartWorld Navigation Experts
Distributor Networks
Pay As You Sail
ENC Online Use
ECDIS Users
Shorebased use
SENC
Licensing rules
DP contract
On site audits
Distribution Partners DPs
O-charts
ChartWorld
SiiTech
ECD Service Users (ECS market)

IC-ENC

Chair Team

Burak Inan

Elected as **Chair** of IC-ENC in July 2023 and currently the Deputy Director of the Turkish Navy-Office of Navigation, Hydrography and Oceanography.

Pia Dahl Højgaard

Vice Chair of IC-ENC and as of January 2016, she has held the position as Danish National Hydrographer

Leendert Dorst

Vice Chair of IC-ENC, Leendert is the Deputy Hydrographer and Head of the Staff Group at the Royal Netherlands Navy.

Michael Andrew

Michael Andrew was elected as IC-ENC Vice Chair in July 2022 and is currently Assistant Director at the Australian Hydrographic Office.

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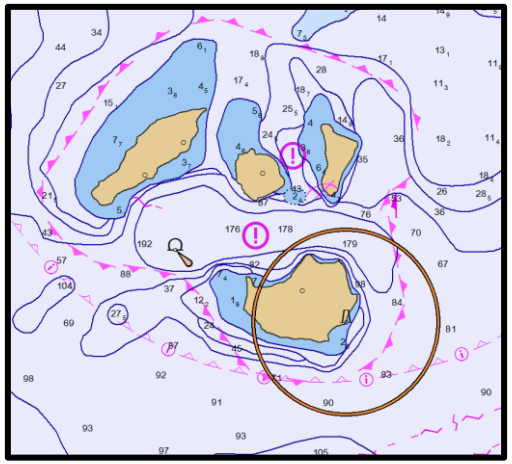
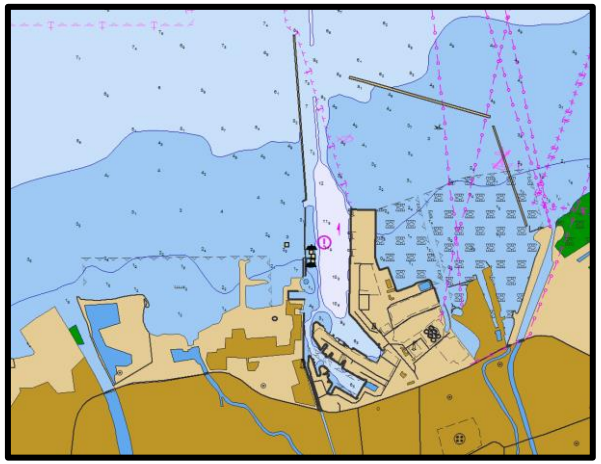
IC-ENC ENC Services, Distribution, Assurance, Revenue Management

IC-ENC

2023 ENC Service Highlights

- Over 14,000 files released, including:
  - 1,460 New Cells, 3,600 New Editions and 8,500 updates
- IC-ENC Folio reached 12,000 ENCs
- New Members Data Released
  - Lebanon and Saudi Arabia
- New 49th & 50th Members joined
  - Fiji & Indonesia





IC-ENC

Our Value-Added Resellers

High quality companies appointed to deliver comprehensive end-user services.

By doing so, our members avoid:
- The cost of developing and marketing their own services for global distribution
- Appointing and managing an extensive distributor network with the associated commercial and legal requirements
- The need for complex and expensive service delivery systems

ADMIRALTY
Maritime Data Solutions

PRIMAR®

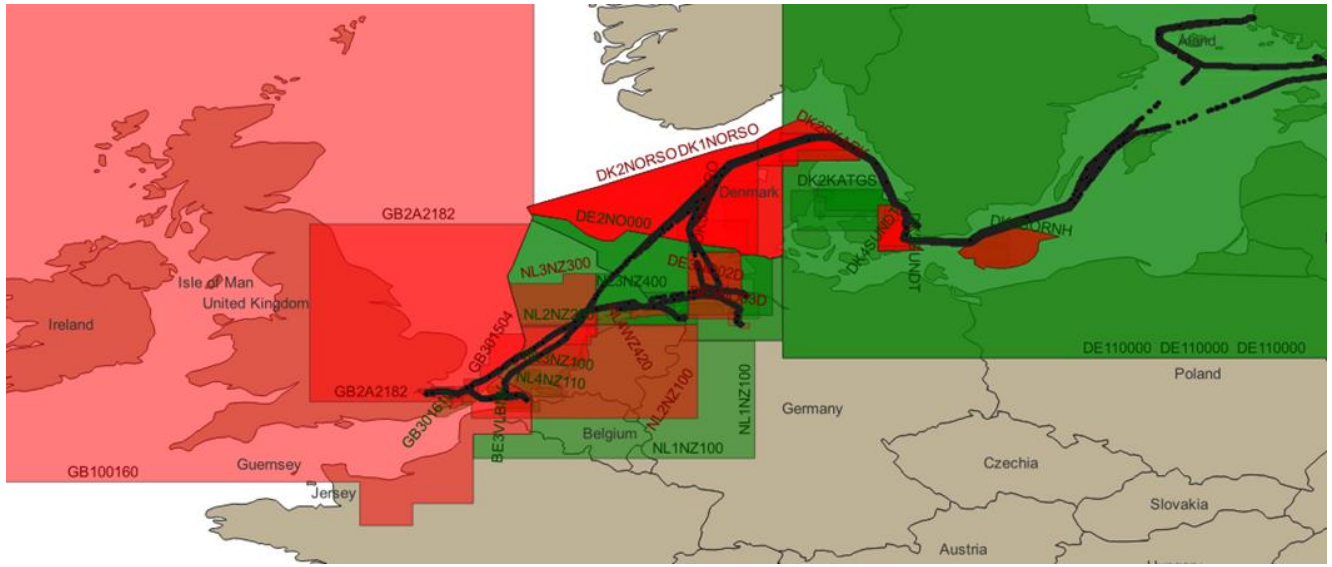
NAVTOR

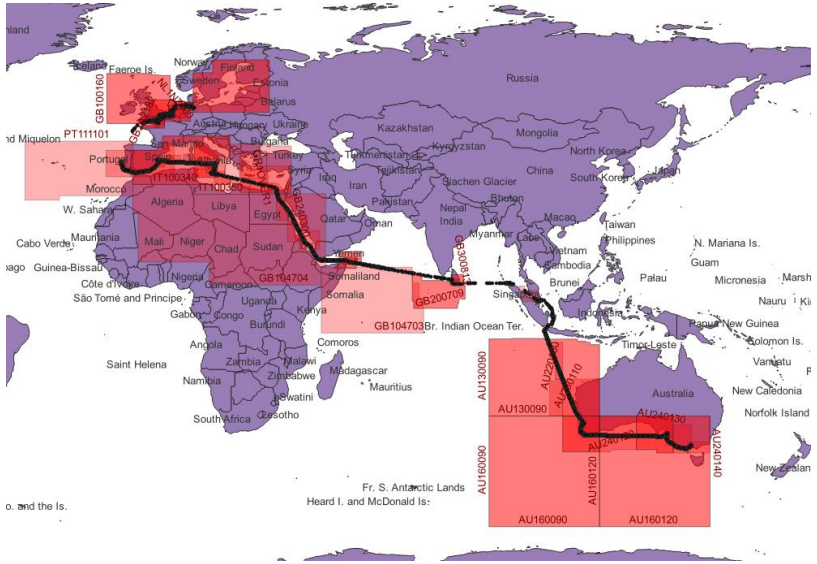
ChartWorld
Navigation Experts

IC-ENC

IC-ENC Assurance Activity

- IC-ENC have developed a tool, combining four data feeds (AIS, shipping database, IC-ENC sales information, ENC catalogue) to identify sales reporting ‘discrepancies’. These are then investigated.





- Discrepancies include; late reporting, under reporting (systems failure), inaccurate reporting.
- Resolution/solution is dependent on the type of problem found via the root cause analysis.

IC-ENC

ECD Service Distribution

Whilst IC-ENC has historically focused on the distribution of ENCs used on an ECDIS, in 2021 we launched the Electronic Chart Data (ECD) Service.

Its purpose is to enhance safety of navigation in a nation's waters.

Appointed companies receive ENCs and use this data to build their own services to vessels navigating electronically but not using an ECDIS.

The service continues to grow with **24** active participants and further members set to join during 2024.

We currently have 3 appointed distribution partners and are in various stages of onboarding several more.

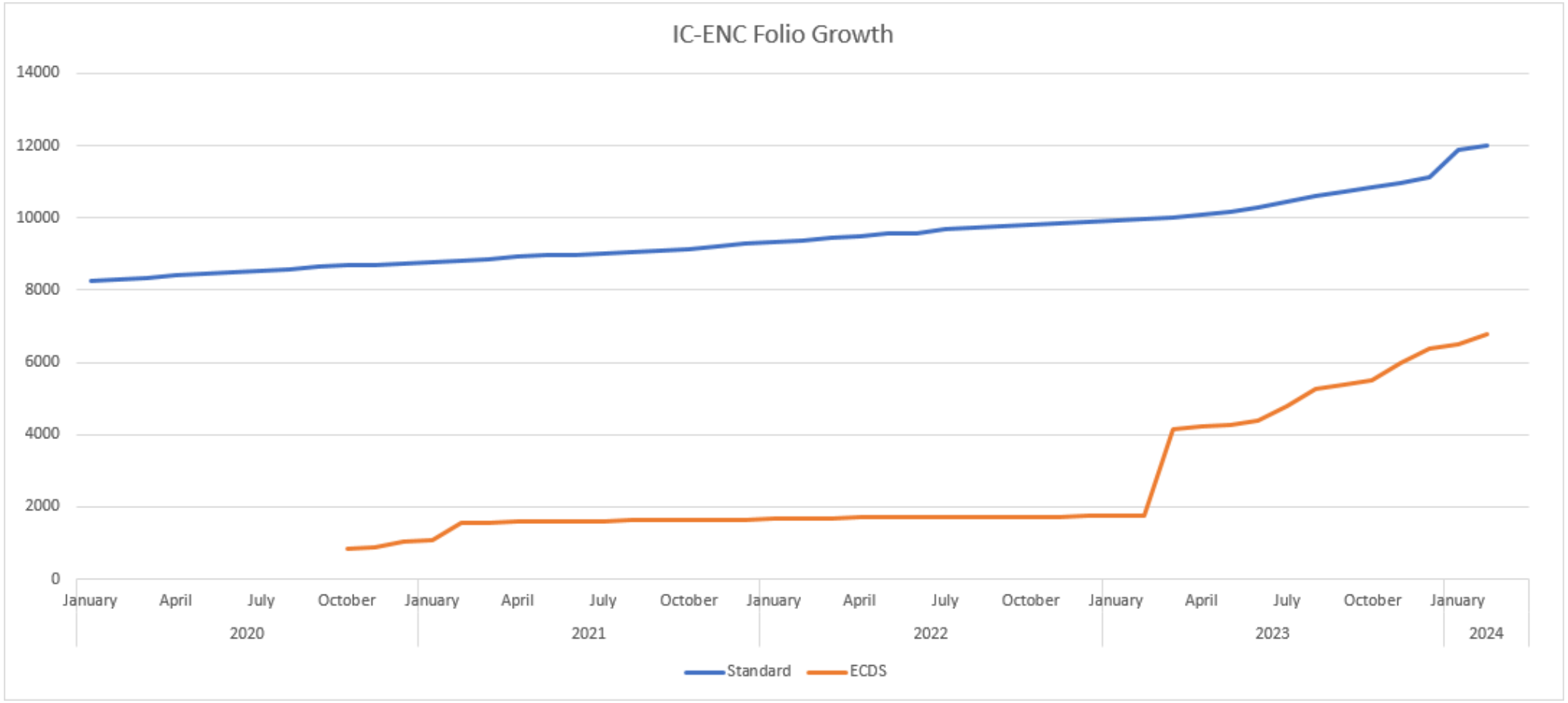
Quality charts for OpenCPN
O-charts

SiiTech

ChartWorld
Navigation Experts

IC-ENC

ECD Service Distribution – closing the gap



IC-ENC

Revenue Management – “Opt In” fund

IC-ENC Members are supporting an ‘opt in’ fund, whereby a portion of their national ENC revenue is set aside for other projects.

16 Members have ‘opted in’ to this new scheme

USD 450,000 generated for projects for 2024

Projects supported are for a range of activities including Standards development and Capacity Building

IC-ENC

Revenue Management – "Opt In" fund

Ref	From	Role	Member sponsor	Title of proposal	Amount, USD	Benefit areas	Recommendation	Conclusion	Conclusion	Conclusion	Conclusion	STATUS 8/1/23
2023-01	Julia Powell	S100 WG Chair	US	Development and finalization of S-98	- 50,000	3	Support	Support	Support	Support	Support	Proceeding under the "Unanimous Support" conclusion. Tender is live for suppliers to respond, closing date 15th January.
2023-02	Julia Powell	S100 WG Chair	US	S-164 – Test Data Sets for S100 ECDIS	- 40,000	3	Support	Support	Support	Support	Support	Proceeding under the "Unanimous Support" conclusion. Tender is live for suppliers to respond, closing date 15th January.
2023-03	John Nyberg	IHO Director	TBC	IHO Operational S-100 Infrastructure Study	- 20,000		Pause	Pause	Pause	Pause	Pause	Unanimous agreement to PAUSE, further investigation to continue under Work Plan.
2023-04	John Nyberg	IHO Director	DE	S-122 Marine Protected Area Product Specification Update	- 20,000	3	Support	Pause	Support – but it is not a priority	Support with reservations	Support	Proceeding under the majority view, and noted it is a lower priority than S100 Phase 1 items.
2023-05	Michael Andrew	S100 Security Scheme PT	AU	S100 Security Scheme - legal advice and contract drafting	- 50,000	3	Support	Support	Support	Support	Support	Proceeding under the Unanimous Support conclusion. Awaiting further response from S100 Security Scheme PT Chair.
2023-06	Tom Richardson	UKHO	UK	Development of S-101 2.0.0 Test Datasets	- 25,000	3, 4	Support	Pause	Support	Support	Support	Proceeding under the majority view conclusion. Supplier to be identified.
2023-07	Burak Inan	SHODB	TR	Bespoke two-stage ENC conversion training (4 cohorts, regionally)	- 125,000	1, 2, 5	Support	Support	Support	Support	Support	Proceeding under the Unanimous Support conclusion. 4 regional workshops to be held in 2024. Calling notice for Member participation to be issued by end of January.
2023-08	Burak Inan	MBSHC CBC	TR	MBSHC ENC QA and conversion workshop	- 40,000	1, 2, 5	Support, with notes	Support	Support	Support agree comment/notes	Support	Proceeding under the Unanimous Support conclusion. Course to be delivered in Istanbul w/c 20th May 2024. Calling notice for Member/MBSHC MS participation to be issued by end of January.
2023-09	Burak Inan/IC-ENC	SHODB/IC-ENC	TR	S102 and S104 training	- 25,000	1, 2, 5	Support, with notes	Support	Support, with notes	Support	Support	Proceeding under the Unanimous Support conclusion. Statement of Requirement is being finalised in order to identify supplier.

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ENC Conversion Analysis Summary

IC-ENC

Conversion conclusions/key findings

1) ENC production tools are developing sufficient functionality, **so that S-57 / S-101 production and/or conversion is able to be done at source (i.e. by HO),** and in a fully automated manner. It is recognised that there are still challenges to be resolved for ENC Conversion to become fully automated, these include:

- Data Coverage
- Caution Area
- Bridge
- Tidal Stream Panel
- Restricted Area
- Compilation Scale
- Quality of Bathymetric Data
- Skin of the Earth features
- Metadata
- Support File Names
- Digital Signatures

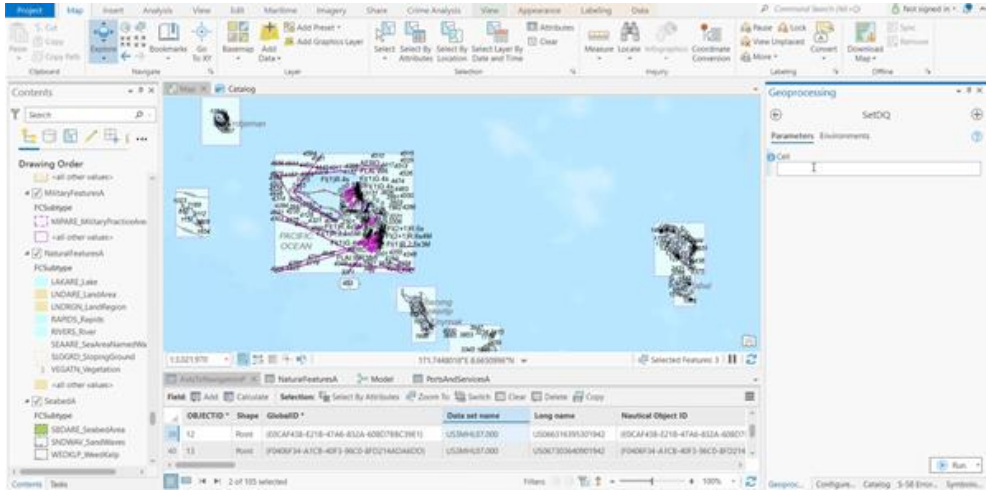
2) An IC-ENC third party conversion service is technically feasible, but **not recommended.**

3) There is **very little declared interest amongst IC-ENC Members** for a conversion service.

IC-ENC

How IC-ENC will support Members with their own conversion

- IC-ENC Conversion Readiness Service
  - Extension of the S-57 Validation Service
  - Support Members with the preparation of their S-57 data for conversion to S-101
    - Conversion Readiness Checks
    - Sample assessment of datasets
    - Validation tool testing
    - Technical Conferences
    - ENC global query capability tool



- Training:
  - Online training seminars specifically on S-57 to S-101 conversion
  - IC-ENC hosted seminars from the production tool companies on their software

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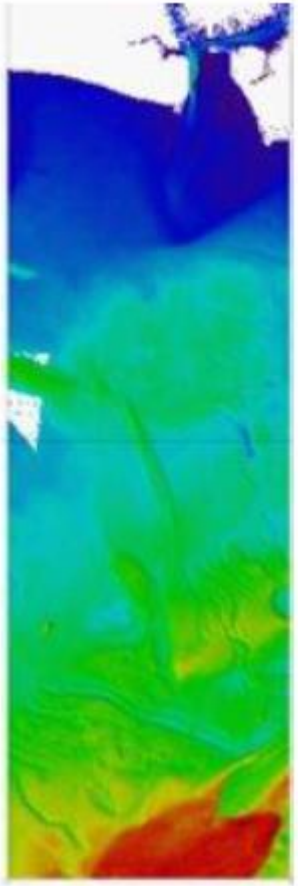
S-100 Services

IC-ENC

Introduction

- IC-ENC has developed the first generation of S-100 services, S-101, S-102, S-104, S-111, S-122, and S-128 generation with four key goals in mind:
  1. Member engagement, ensuring IC-ENC supports its Members with their S-100 prioritisations
  2. Community ethos in sharing production experience, recognising that across the IC-ENC Membership, Members are at differerent stages of their transition to S-100, and no-one is left behind
  3. Close alignment with the IHO Phase 1/Route Monitoring prioritised product types
  4. Increasing automation whilst continuing to provide value add to Members
- IC-ENC plans to identify/develop the next generation of S-100 services through further Member engagement

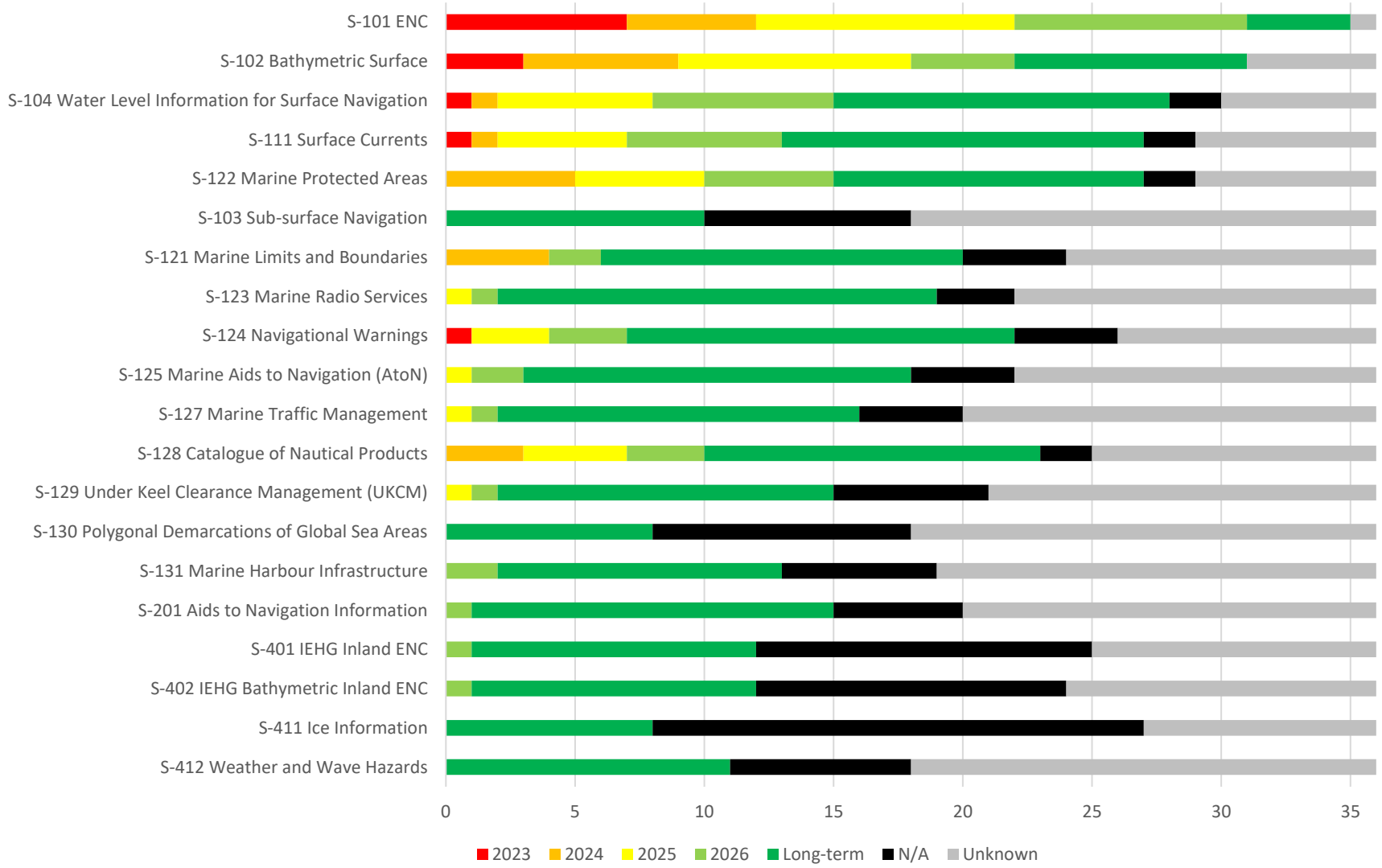


First generation S-10x services:

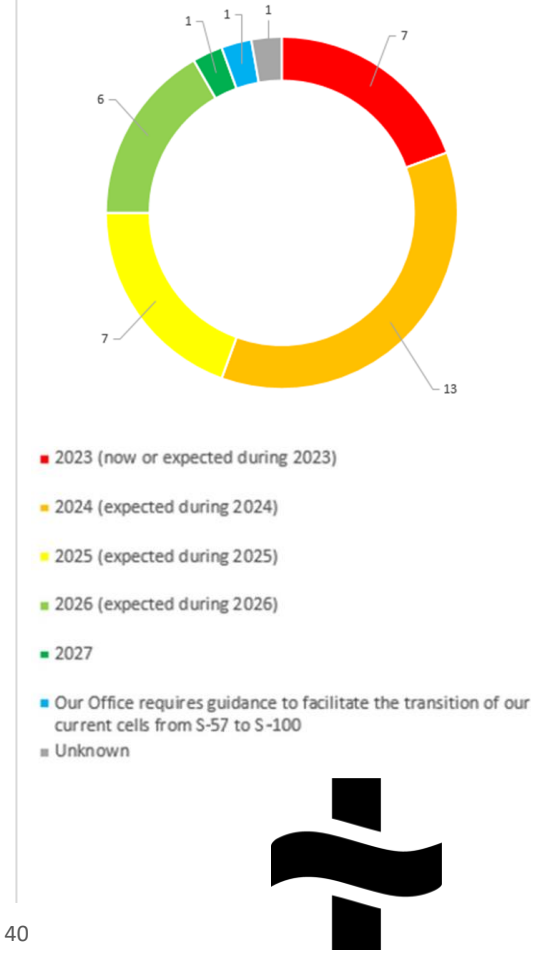
- S-101 - Electronic Navigational Chart (ENC)
- S-102 - Bathymetric Surface Product
- S-104 - Water Level Information for Surface Navigation
- S-111 - Surface Currents
- S-122 - Marine Protected Areas
- S-128 - Catalogue of Nautical Products
- Conversion Readiness Service

IC-ENC

Context: Members' S-1XX Production Plans

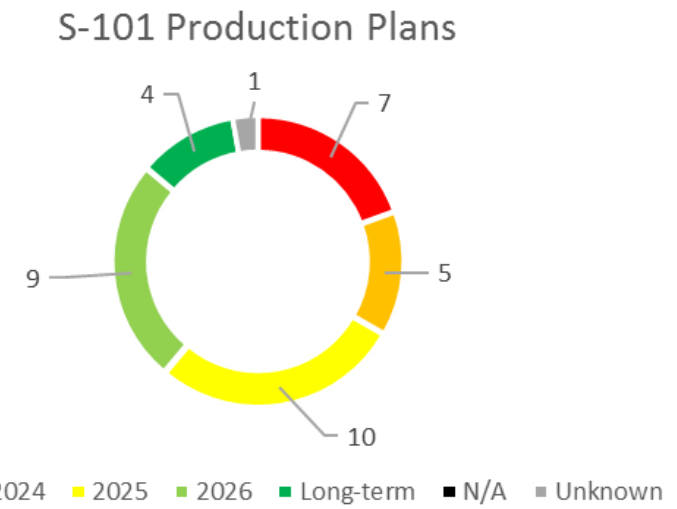


S-57 to S-101 conversion timeframes



S-100 Services - Progress

- Initial end-to-end services for S-101, S-102, S-104 and S-111 have been developed and built into the IC-ENC workflow tool
  - **S-101** - based on current S-57 service, but with S-101 enhancements
  - **S-102** - automated where possible
  - **S-104 and S-111** - automated process due to expected high cadence (e.g. every 6hrs)
  - All services support S-100 Ed 5.0.0 datasets
- **S-122** - in scope, but remains outside of IC-ENC workflow tool, processed through manual examination
- **S-128** - generated by the IC-ENC workflow tool for each release
- **Conversion Readiness Service**
- **S-100 Knowledgebase** is now available to Members
  - Contains IC-ENC S-1XX registration checks
  - Will include S-100 Validation checks once published
- **Exchange Set Service tool** integrated into the IC-ENC workflow tool for the generation of S-100 exchange sets and digital signing



The S-100 landscape/Challenges:

- S-1XX Product Specifications are still at different levels of maturity
- No published S-100 Validation checks yet which limits validation software tool development
- More test datasets are key to support development and testing phase

IC-ENC

Conversion Readiness Service

- The goal of the Conversion Readiness Service is to support members with the preparation of their S-57 ENCs for conversion to S-101

- This service is an extension of the S-57 Validation Service

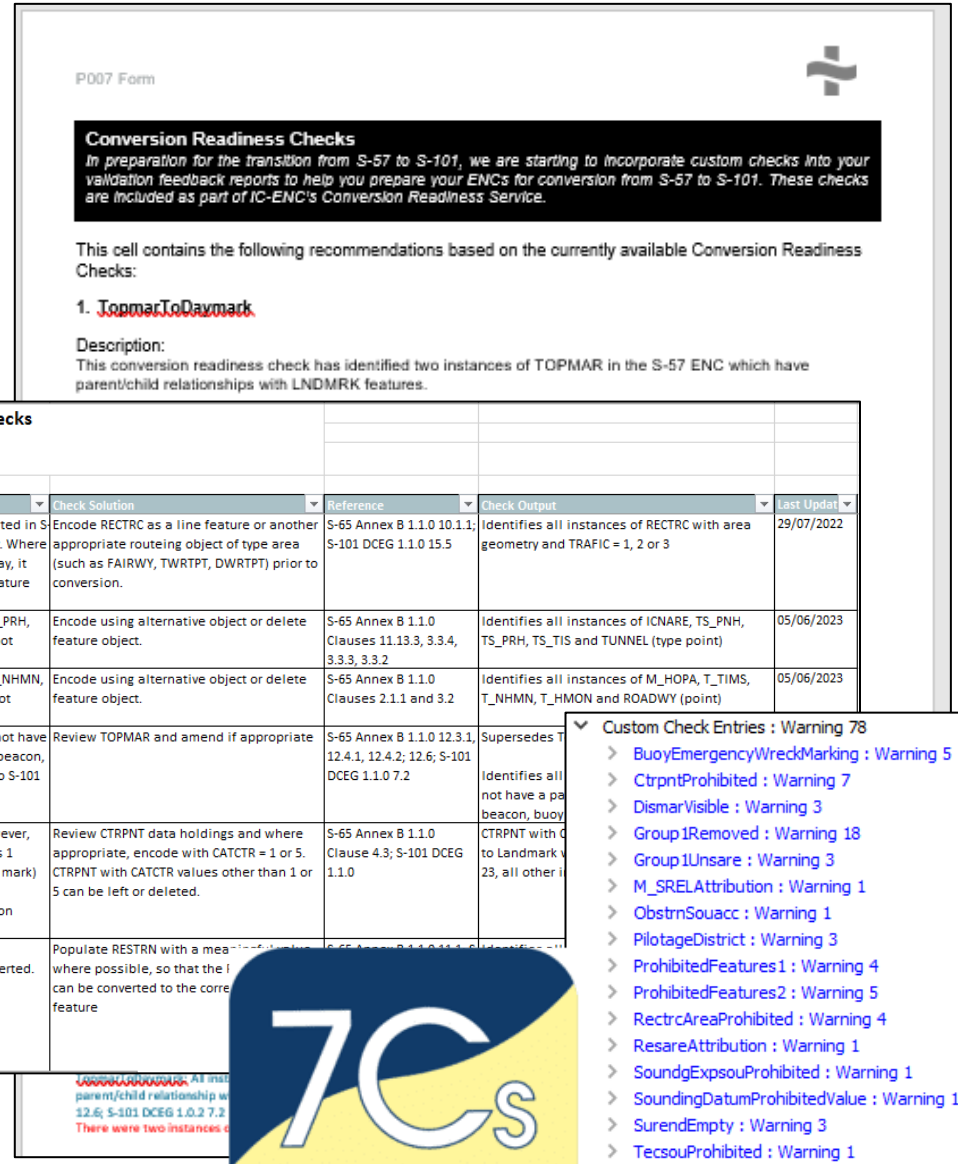
- Components of the service:
  a) Conversion Readiness Checks
  b) S-57 to S-101 conversion assessments
  c) S-101 trial data assessments
  d) S-100 validation tool testing
  e) ENC global query capability
  f) IC-ENC Knowledgebase
  g) Technical Conference

3	Conversion Readiness Service	a		2 - Started and on track	Conversion readiness checks up to date for S-101 1.1.0. A review will be conducted once 1.2.0 is published (March 2024).	
3	Conversion Readiness Service	b		2 - Started and on track	Conversion readiness checks continue to be reported on all base cell validations	
3	Conversion Readiness Service	c		2 - Started and on track	TCL01/2024 issued on 04/01/2024 offering to provide Members with conversion assessments of up to 10 of their S-57 ENCs. To date, 9 Members have requested a conversion assessment; 5 are complete and 4 are in progress. SSO now has support with this work from two Validators.	
3	Conversion Readiness Service	d		2 - Started and on track	13 x S-101 trial datasets received in Q1 2024 so far; 12 NL as part of S-101 trial and 1 PE	
3	Conversion Readiness Service	e		2 - Started and on track	Work on implementation has started in Q1, once completed this will provide the functionality to start generating reports for our Members. Progress will be shared at TC24_1.	
3	Conversion Readiness Service	f		2 - Started and on track	Awaiting new version of 7Cs Analyzer which will support S-101 1.2.0 once published (March 2024).	Investigate IIC comparison tooling for S-57/S-101 differencing

IC-ENC

a) Conversion Readiness Checks

- A set of 21 checks identified from S-57 to S-101 Conversion Guidance (S-65 Annex B), S-101 1.1.0 and S-100 5.0.0
- Provide recommended action steps that members can take in their S-57 ENCs to prepare for conversion to S-101, i.e. “conversion ready ENCs”
- Recommended action is provided in the Validation Report for all base cell validations
- **Members can use the checks in their own 7Cs Analyzer and CARIS tools**
- Key resources for Members:
  - IC-ENC Knowledgebase
  - IC-ENC LMS


P007 Form

Conversion Readiness Checks

In preparation for the transition from S-57 to S-101, we are starting to incorporate custom checks into your validation feedback reports to help you prepare your ENCs for conversion from S-57 to S-101. These checks are included as part of IC-ENC's Conversion Readiness Service.

This cell contains the following recommendations based on the currently available Conversion Readiness Checks:

1. TopmarToDaymark

Description:
This conversion readiness check has identified two instances of TOPMAR in the S-57 ENC which have parent/child relationships with LNDMRK features.

IC-ENC **Conversion Readiness Checks**
Last updated: 05/06/2023
Built in 7Cs Analyzer 5.1.0.12

	Check ID	Check Message	Check Solution	Reference	Check Output	Last Updat
1	RectrcAreaProhibited	Area geometry for RECTRC is prohibited in S-101, except where TRAFIC = two-way. Where an area RECTRC has TRAFIC = two-way, it will be converted into new S-101 feature TwoWayRoutePart.	Encode RECTRC as a line feature or another appropriate routeing object of type area (such as FAIRWY, TWRTPT, DWRTPT) prior to conversion.	S-65 Annex B 1.1.0 10.1.1; S-101 DCEG 1.1.0 15.5	Identifies all instances of RECTRC with area geometry and TRAFIC = 1, 2 or 3	29/07/2022
2	ProhibitedFeatures1	Feature objects ICNARE, TS_PNH, TS_PRH, T_TIS and TUNNEL (type point) are not permitted in S-101.	Encode using alternative object or delete feature object.	S-65 Annex B 1.1.0 Clauses 11.13.3, 3.3.4, 3.3.3, 3.3.2	Identifies all instances of ICNARE, TS_PNH, TS_PRH, TS_TIS and TUNNEL (type point)	05/06/2023
3	ProhibitedFeatures2	Feature objects M_HOPA, T_TIMS, T_NHMN, T_HMON and ROADWY (point) are not permitted in S-101.	Encode using alternative object or delete feature object.	S-65 Annex B 1.1.0 Clauses 2.1.1 and 3.2	Identifies all instances of M_HOPA, T_TIMS, T_NHMN, T_HMON and ROADWY (point)	05/06/2023
4	TopmarToDaymark	All instances of TOPMAR which do not have a parent/child relationship with a beacon, buoy or LITFLT will be converted into S-101 feature Daymark.	Review TOPMAR and amend if appropriate	S-65 Annex B 1.1.0 12.3.1, 12.4.1, 12.4.2; 12.6; S-101 DCEG 1.1.0 7.2	Supersedes T… Identifies all… not have a pa… beacon, buoy…	
5	CtrpntProhibited	CTRPNT does not exist in S-101, however, CTRPNT features with CATCTR values 1 (triangulation mark) or 5 (boundary mark) will be converted to Landmark with categoryOfLandmark 22 (triangulation mark) or 23 (boundary mark).	Review CTRPNT data holdings and where appropriate, encode with CATCTR = 1 or 5. CTRPNT with CATCTR values other than 1 or 5 can be left or deleted.	S-65 Annex B 1.1.0 Clause 4.3; S-101 DCEG 1.1.0	CTRPNT with C… to Landmark v… 23, all other i…	
6	ResareAttribution	Where RESTRN is empty or set to 'unknown', RESARE may not be converted.	Populate RESTRN with a mea… where possible, so that the f… can be converted to the corre… feature			

Custom Check Entries : Warning 78
- BuoyEmergencyWreckMarking : Warning 5
- CtrpntProhibited : Warning 7
- DismarVisible : Warning 3
- Group1Removed : Warning 18
- Group1Unsare : Warning 3
- M_SRELAttribution : Warning 1
- ObstrnSouacc : Warning 1
- PilotageDistrict : Warning 3
- ProhibitedFeatures1 : Warning 4
- ProhibitedFeatures2 : Warning 5
- RectrcAreaProhibited : Warning 4
- ResareAttribution : Warning 1
- SoundgExpsouProhibited : Warning 1
- SoundingDatumProhibitedValue : Warning 1
- SurendEmpty : Warning 3
- TecsouProhibited : Warning 1
- TopmarToDaymark : Warning 5
- UwtrocSouacc : Warning 3
- VerticalDatumProhibitedValue : Warning 1
- VesselTrafficServiceArea : Warning 8

7Cs SevenCs

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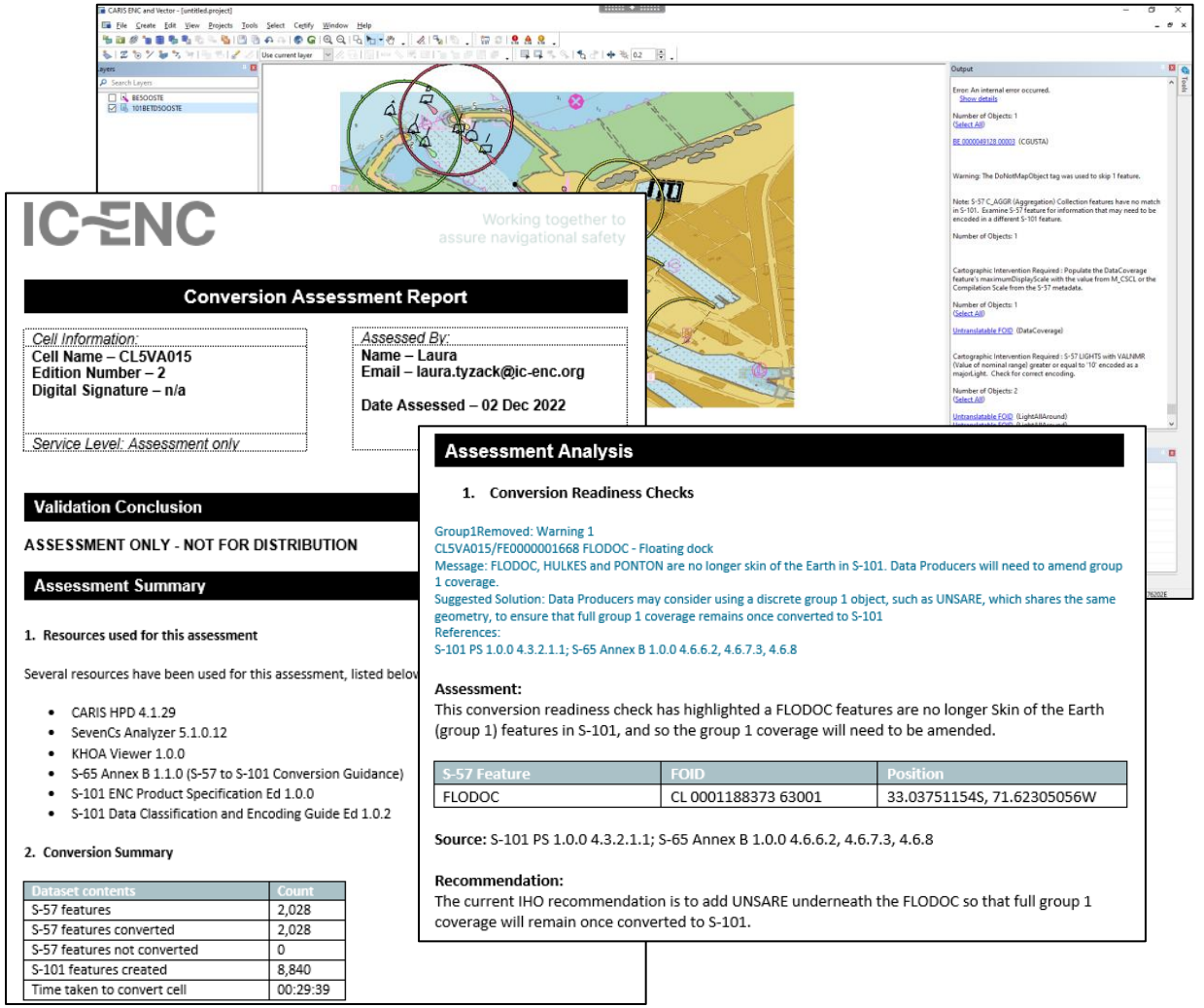
b) S-57 to S-101 conversion assessments

- We provide conversion assessment of Members' S-57 ENCs (sample size agreed with Member)

- This includes:
  - Assessment against the Conversion Readiness Checks
  - Converting from S-57 to S-101 using CARIS HPD
  - Assessment report for each ENC with findings/recommended action to take

- S-101 to S-57 assessments will be offered once the S-101 to S-57 Conversion Guidance has been drafted (S-65 Annex C)



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Conversion Assessment Report

Cell Information:
Cell Name – CL5VA015
Edition Number – 2
Digital Signature – n/a

Assessed By:
Name – Laura
Email – laura.tyzack@ic-enc.org

Date Assessed – 02 Dec 2022

Service Level: Assessment only

Validation Conclusion

ASSESSMENT ONLY - NOT FOR DISTRIBUTION

Assessment Summary

1. **Resources used for this assessment**

Several resources have been used for this assessment, listed belov

- CARIS HPD 4.1.29
- SevenCs Analyzer 5.1.0.12
- KHOA Viewer 1.0.0
- S-65 Annex B 1.1.0 (S-57 to S-101 Conversion Guidance)
- S-101 ENC Product Specification Ed 1.0.0
- S-101 Data Classification and Encoding Guide Ed 1.0.2

2. **Conversion Summary**

Dataset contents	Count
S-57 features	2,028
S-57 features converted	2,028
S-57 features not converted	0
S-101 features created	8,840
Time taken to convert cell	00:29:39

Assessment Analysis

1. **Conversion Readiness Checks**

Group1Removed: Warning 1
CL5VA015/FE0000001668 FLODOC - Floating dock
Message: FLODOC, HULKES and PONTON are no longer skin of the Earth in S-101. Data Producers will need to amend group 1 coverage.
Suggested Solution: Data Producers may consider using a discrete group 1 object, such as UNSARE, which shares the same geometry, to ensure that full group 1 coverage remains once converted to S-101
References:
S-101 PS 1.0.0 4.3.2.1.1; S-65 Annex B 1.0.0 4.6.6.2, 4.6.7.3, 4.6.8

Assessment:
This conversion readiness check has highlighted a FLODOC features are no longer Skin of the Earth (group 1) features in S-101, and so the group 1 coverage will need to be amended.

S-57 Feature	FOID	Position
FLODOC	CL 0001188373 63001	33.03751154S, 71.62305056W

Source: S-101 PS 1.0.0 4.3.2.1.1; S-65 Annex B 1.0.0 4.6.6.2, 4.6.7.3, 4.6.8

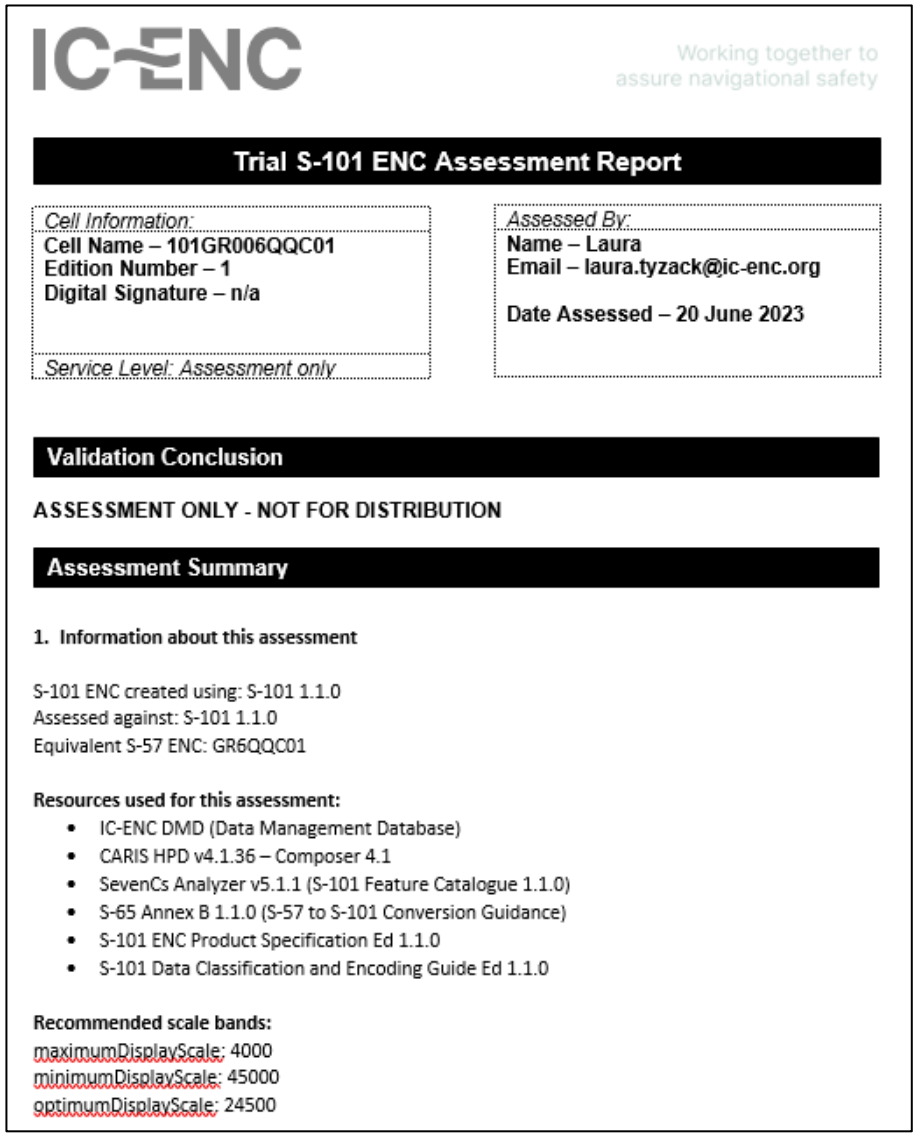
Recommendation:
The current IHO recommendation is to add UNSARE underneath the FLODOC so that full group 1 coverage will remain once converted to S-101.

IC-ENC

c) S-101 trial data assessment

- We assess S-101 trial datasets for Members who have produced them
- To date, we have completed 74 assessments

- The assessment includes:
  - Register in the DMD and assess against DMD S-101 registration checks
  - Run 7Cs Analyzer validation checks
  - Load into CARIS
  - Load into S-100 Viewer tools
  - S-57 vs S-101 comparison checks
  - Assessment report for each ENC with findings/recommended action to take



IC-ENC

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Trial S-101 ENC Assessment Report

Cell Information:
Cell Name – 101GR006QQC01
Edition Number – 1
Digital Signature – n/a

Service Level: Assessment only

Assessed By:
Name – Laura
Email – laura.tyzack@ic-enc.org

Date Assessed – 20 June 2023

Validation Conclusion

ASSESSMENT ONLY - NOT FOR DISTRIBUTION

Assessment Summary

1. Information about this assessment

S-101 ENC created using: S-101 1.1.0
Assessed against: S-101 1.1.0
Equivalent S-57 ENC: GR6QQC01

Resources used for this assessment:

- IC-ENC DMD (Data Management Database)
- CARIS HPD v4.1.36 – Composer 4.1
- SevenCs Analyzer v5.1.1 (S-101 Feature Catalogue 1.1.0)
- S-65 Annex B 1.1.0 (S-57 to S-101 Conversion Guidance)
- S-101 ENC Product Specification Ed 1.1.0
- S-101 Data Classification and Encoding Guide Ed 1.1.0

Recommended scale bands:
maximumDisplayScale: 4000
minimumDisplayScale: 45000
optimumDisplayScale: 24500

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d) Validation tool testing

- IC-ENC will conduct testing of S-100 Validation tools as they become available
- IC-ENC will compare functionality between the most commonly used tools
- This will also provide a way for members to feed back to the software tool manufacturers
- A cloud-based training environment is in development

TELEDYNE CARIS
Everywhereyoulook™

7Cs SevenCs

esri®

i4Insight

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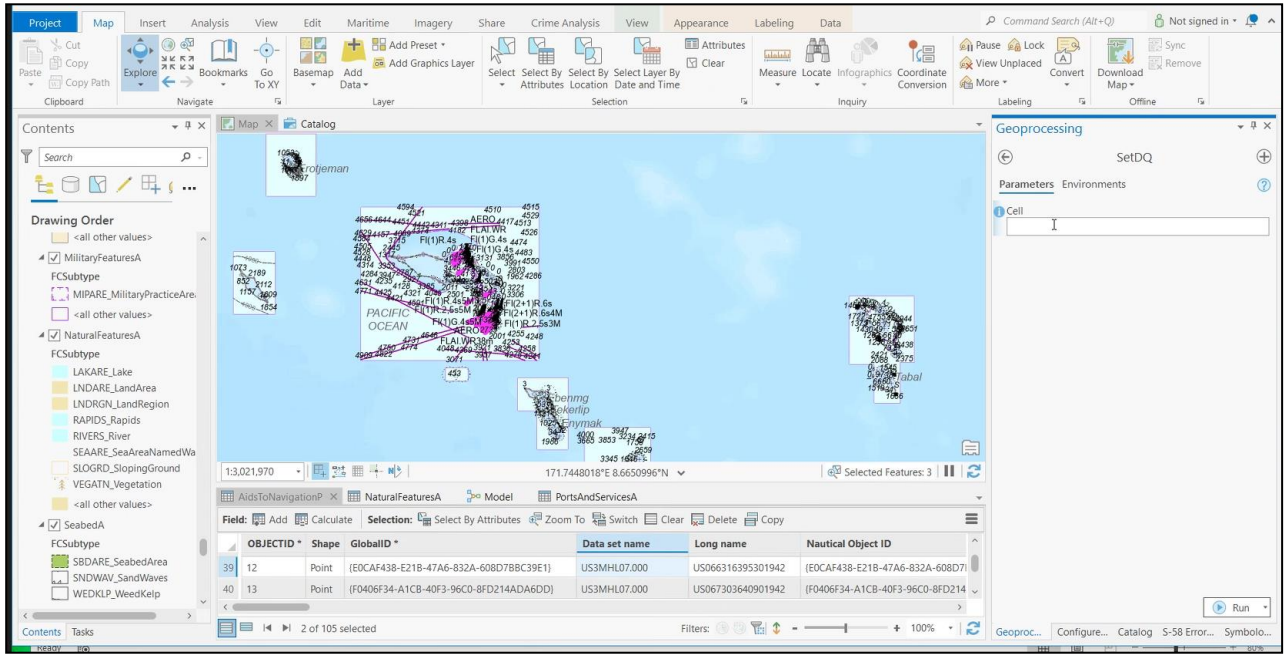
e) ENC global query capability

- Change charter in progress to develop an ENC query tool
- Working with ESRI to build this in the ArcGIS Pro software tool
- Two phase approach:
    1. Build queries based on the Conversion Readiness Checks & where S-101 enrichment could be applied
    2. Build wider checks based on S-65 Annex B (S-57 to S-101 Conversion Guidance) for general improvement and harmonisation



Prototype of ENC query tool in ArcGIS Pro

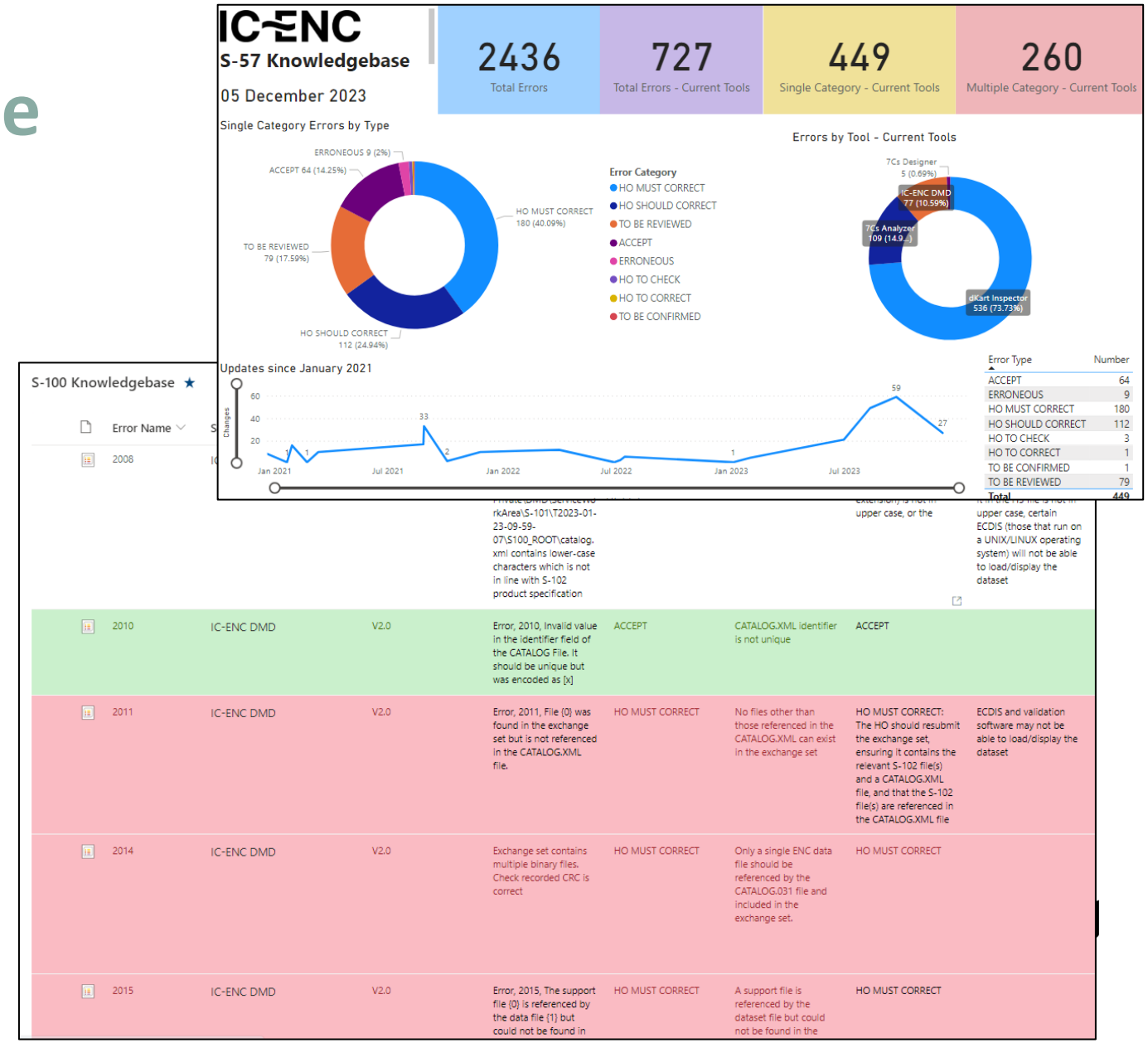
- These queries can then be run on members' portfolios
- Findings will be documented in a report and provided to members

f) IC-ENC Knowledgebase

- **S-57 Knowledgebase**
  - 7Cs Analyzer & Designer errors
  - dKart Inspector errors
  - DMD errors
  - IC-ENC custom checks
  - ECDIS errors
  - Conversion Readiness Checks

- **S-100 Knowledgebase**
  - IC-ENC S-1XX Ingest & Registration Checks
  - IHO S-100 Validation Checks will be added once published
  - 7Cs Analyzer & dKart Inspector errors will be added once developed

- **NEW Conversion Knowledgebase**
  - CARIS conversion log errors



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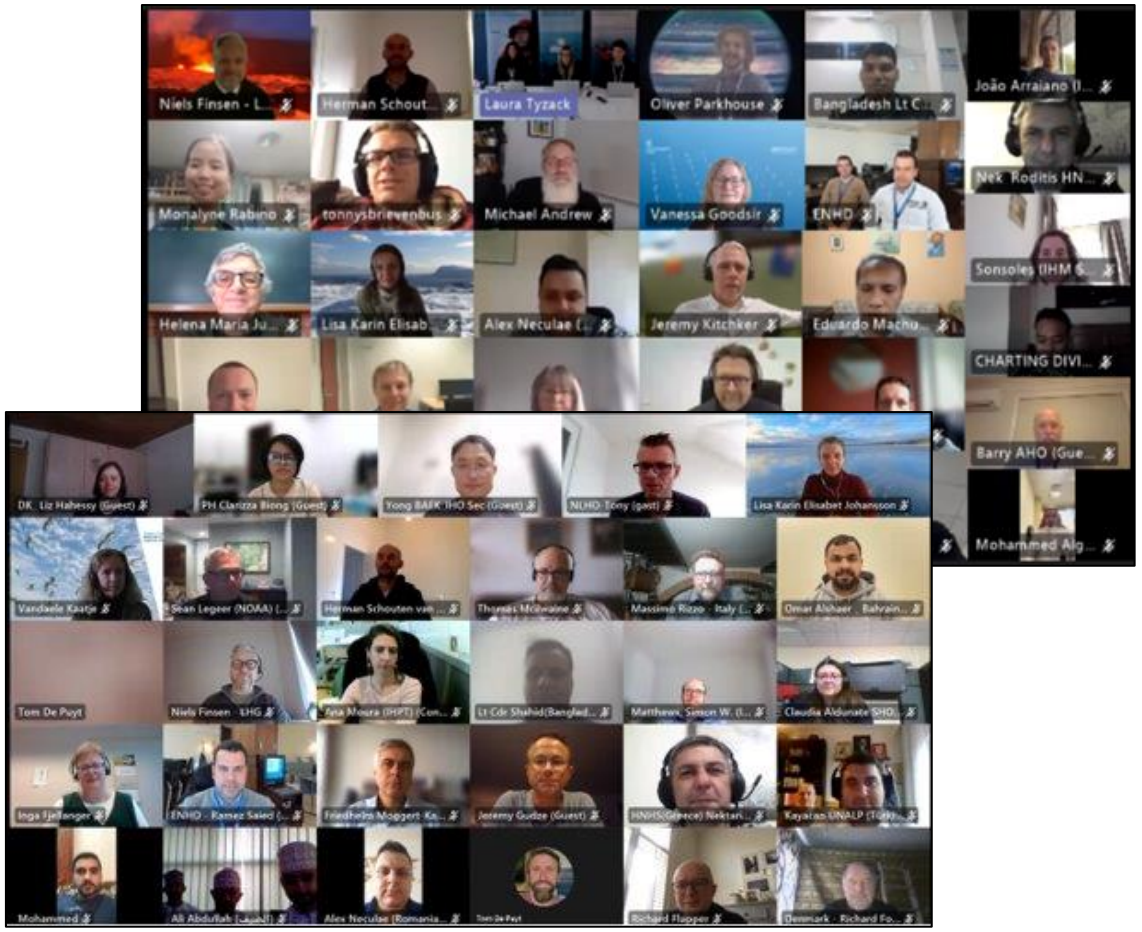
g) Technical Conference (TC)

- Subgroup of the IC-ENC Steering Committee
- Community ethos
- Opportunity for IC-ENC to update members on Work Plan progress
- Opportunity for members to share their own S-57 or S-1XX production experiences to help others
- Updates from Industry – ENC conversion, S-1XX production and validation tool developments



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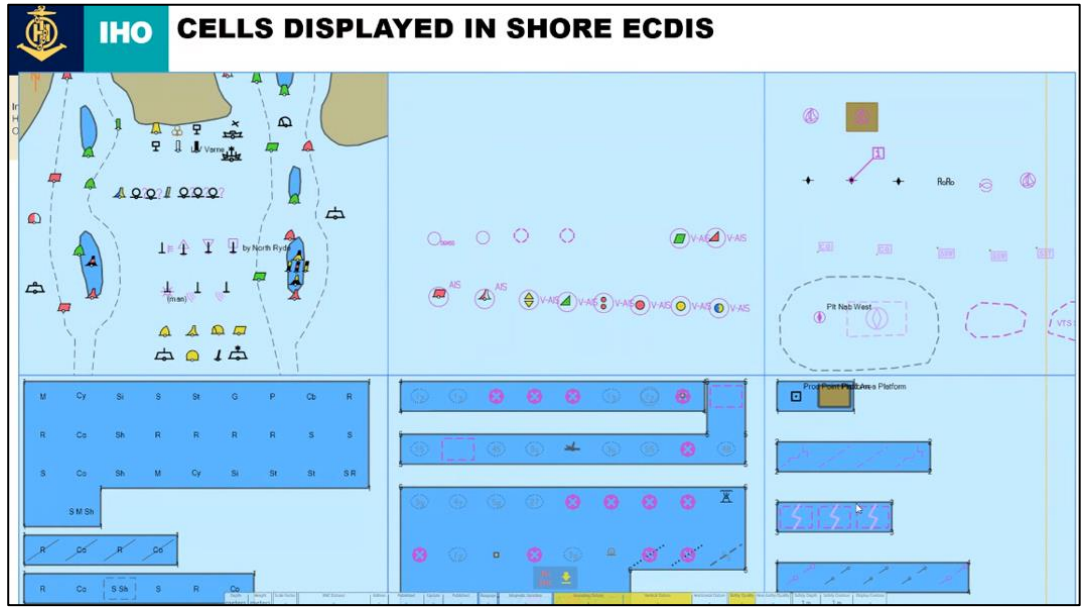
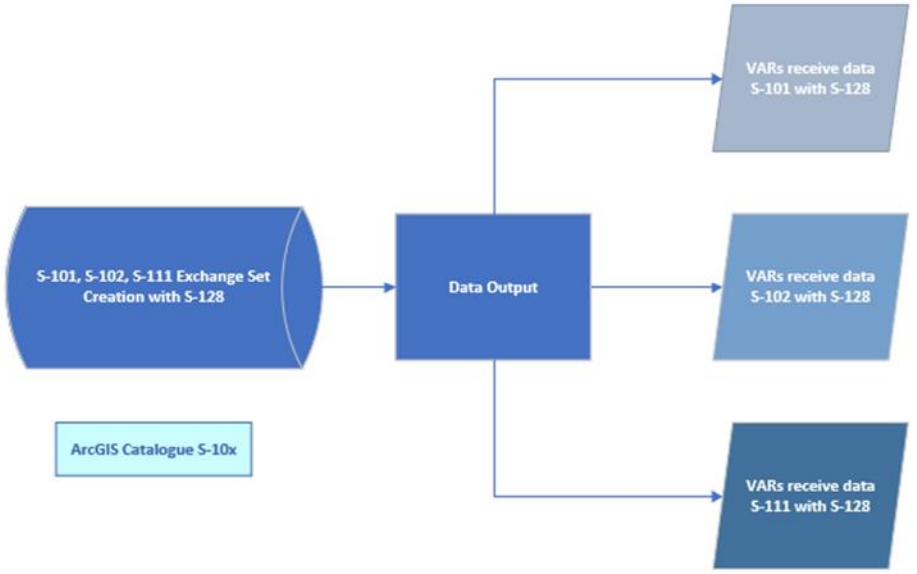
Trials/Testbeds

- IC-ENC plays an active role in S-100 trials and testbeds, including:
- Contributing to the development of IHO S-164 test datasets
- S-101 trial with Netherlands HO (NLHO)
  - NLHO can test their S-101 production processes
  - IC-ENC can test its end-to-end S-101 service
  - Results will be presented at the next IC-ENC Technical Conference in March 2024
- Baltic Sea E-Nav project
  - Support to IC-ENC Members Denmark and Germany, including provision of Conversion Readiness Service



S-128 (Catalogue of Nautical Products) Service

- IC-ENC's S-128 service was decided upon by Member engagement
- A vote at Technical Conference resulted in 100% support for IC-ENC to generate S-128 datasets at S-57 & S-1XX release on behalf of Members
- A joint RENC paper with PRIMAR was also written for WENDWG13 to confirm the RENCs' position on S-128
- IC-ENC workflow tool can now generate S-128 datasets, providing Members and VARs with an S-128 dataset per product type
- Next step: build further capability to generate custom S-128 datasets, such as per Member or a delta (changes rather than cumulative)



Example S-128 generation/output

Product Development & Testing Licence (PDT)

- Provides companies with access to IC-ENC Members' S-1XX datasets for innovation and testing purposes

ADMIRALTY Maritime Data Solutions ChartWorld Navigation Experts NAVTOR PRIMAR®

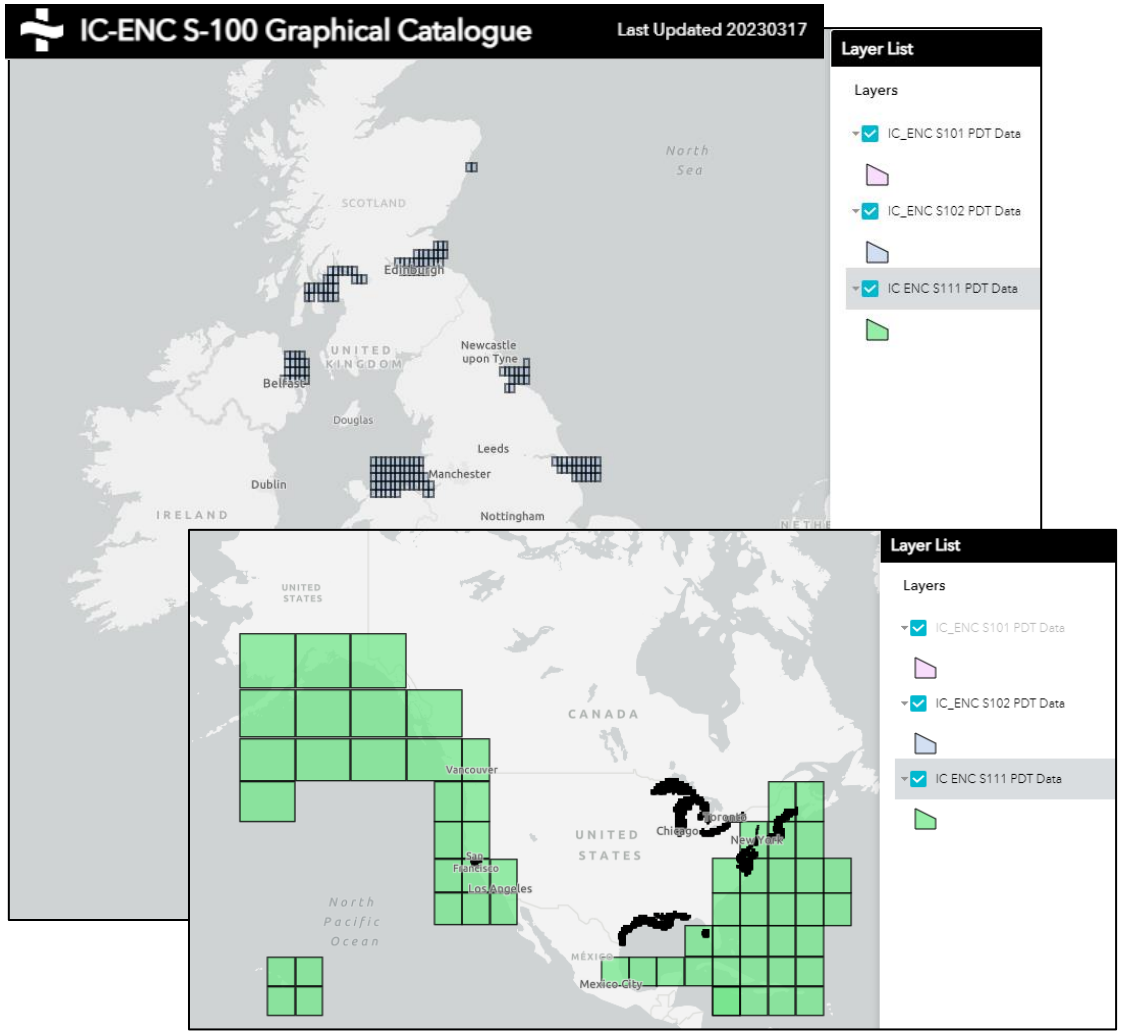
- 6 PDT releases to date

CLEAR WATER FURUNO

- 30 out of 50 Members have "opted in" so far – thank you!
- Recently extended to Members so they can access other Members' datasets for internal R&D purposes
- Formal feedback process

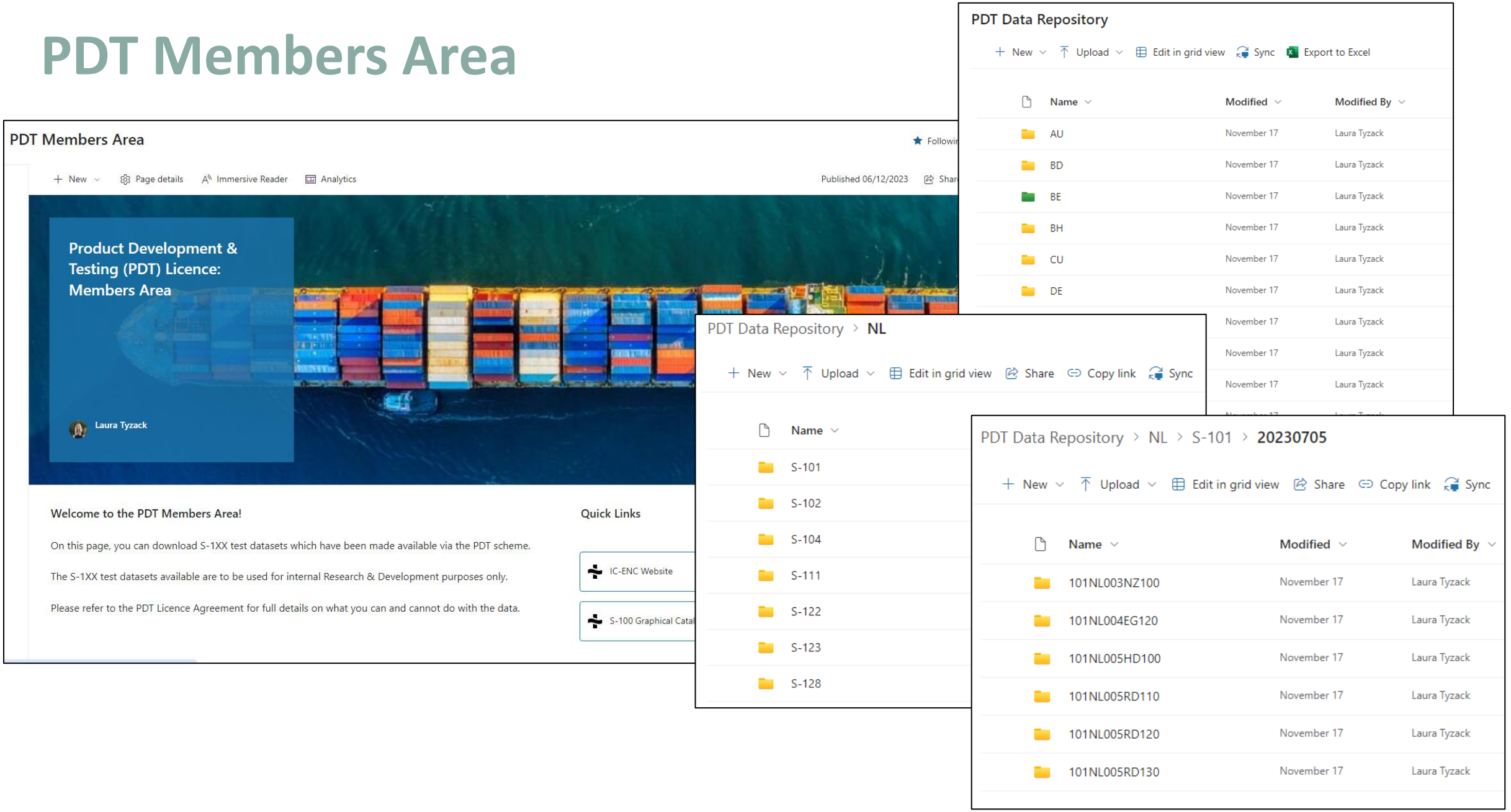
Product Type	Datasets Released	Member
S-101	64	BE, ES, GB, GR, NL
S-102	465	ES, GB, GR, NL, US
S-104	18	NL, US
S-111	591	NL, US
S-122	3	NL
S-123	1	NL
S-128	4	DK, IC-ENC, NL
Total	**1,146**	

S-1XX data released under PDT to date



S-10x data released under PDT shown in the IC-ENC S-100 Graphical Catalogue

PDT Members Area



IC-ENC Working together to assure navigational safety

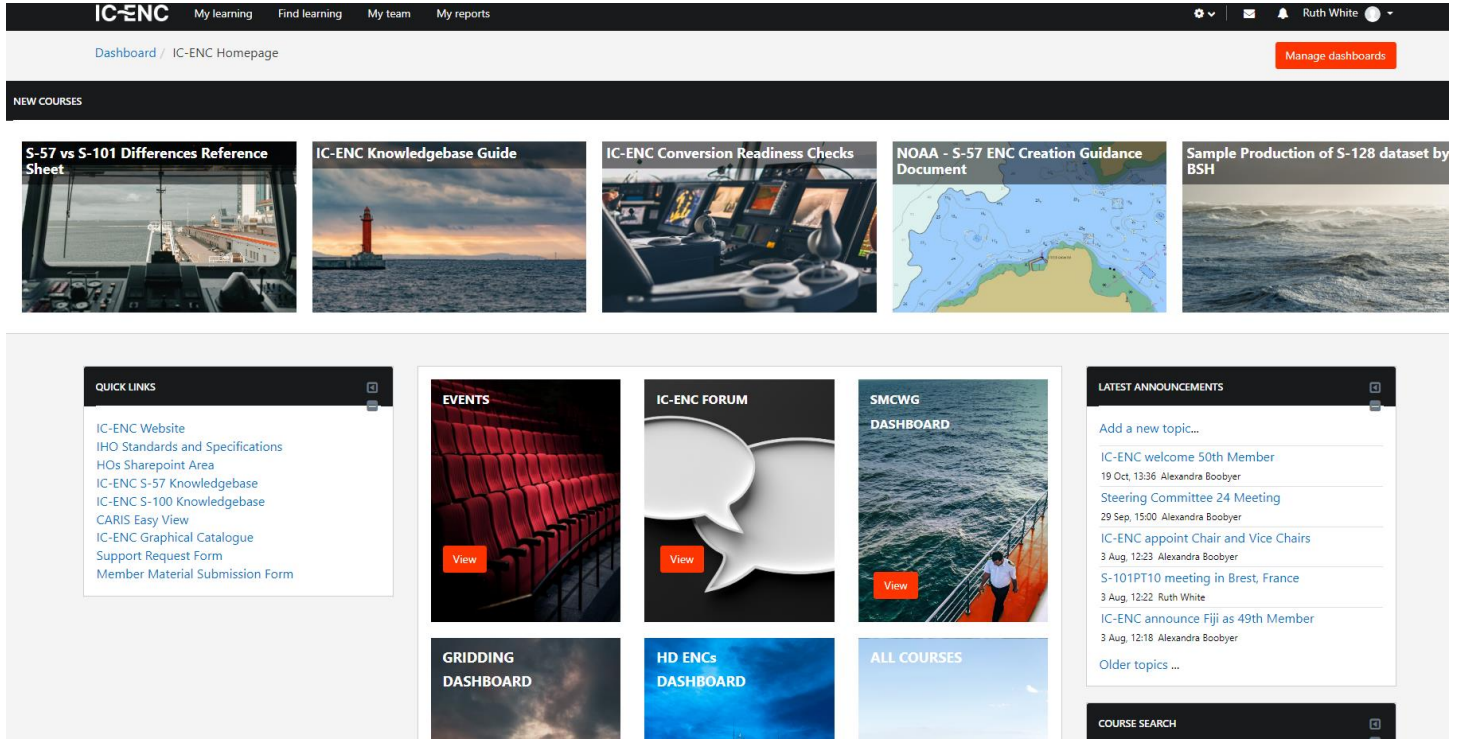
S-100 Training

Learning Management System (LMS)

IC-ENC established a Learning Management System (LMS) in 2021

The LMS has been going from strength to strength with Member sign ups and contributions.

The LMS provides Members with a rich resource of learning and an opportunity to correspond with each other via the IC-ENC forum.



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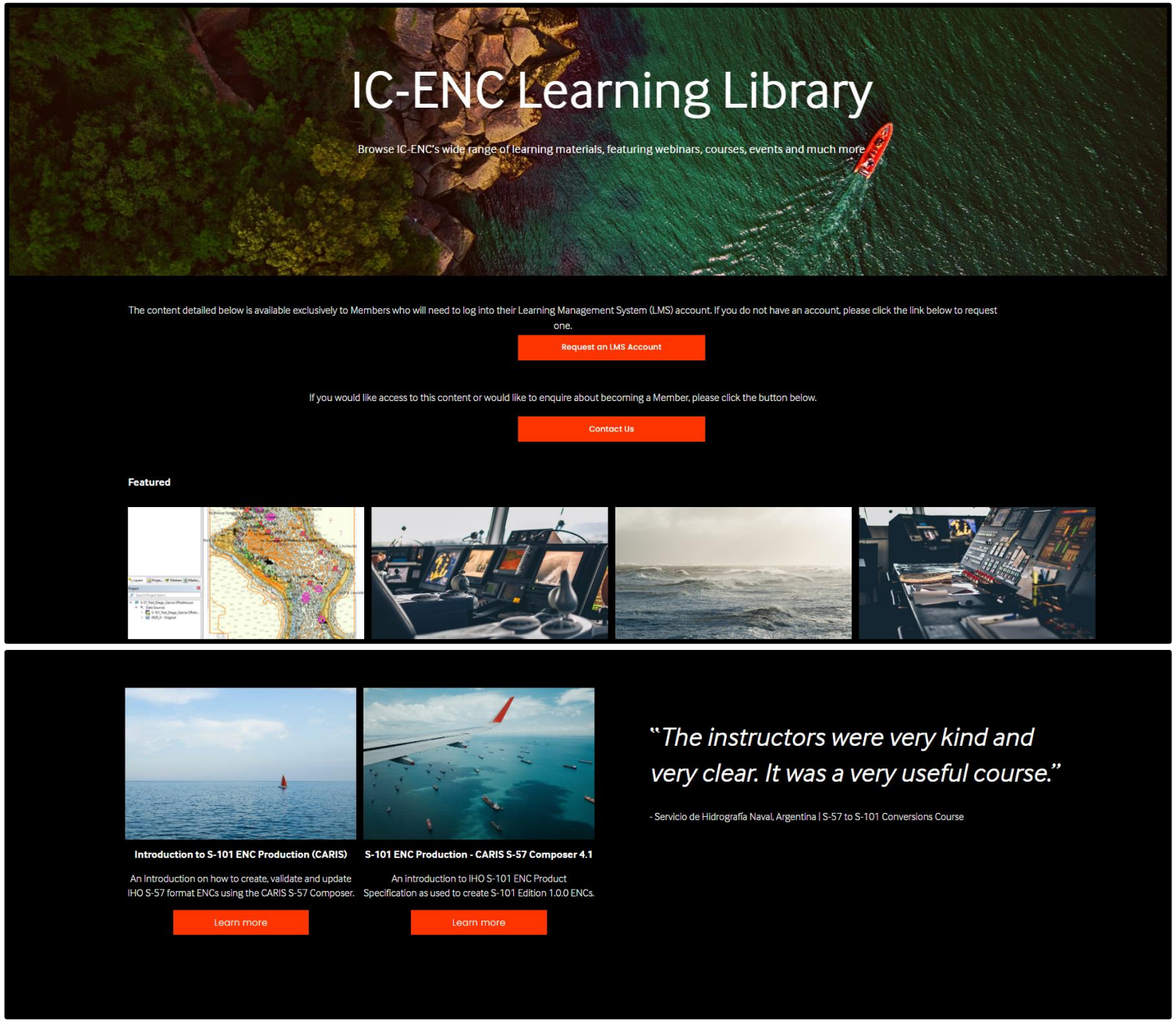
LMS Library Content

Our full LMS Library content can be viewed on our IC-ENC website via the following link [LMS Courses — IC-ENC]

Current content includes:

- IC-ENC Conversion Readiness Checks
- Sample Production of S-128 Datasets
- S-57 ENC Creation Guidance Booklet
- S-57 to S-101 Conversion (training recordings)
- Introduction to S-100 (training recordings)
- Industry Webinar (recordings)
- Technical Conference discussion recordings



IC ENC

Industry Webinars

CARIS presented a webinar on the topic of ‘S-57 and S-101 Production from the same database’

CARIS held two webinars, covering the same content, one on 12th July in English and one on 13th July in Spanish.

Esri held a seminar on 27th June , they demonstrated how Members can use ArcGIS to convert to S-57 ENCs into S-101 data.

SevenCs held two seminars on 29th June to cover different time zones.

SevenCs gave an overview of the latest developments and a look into their conversion tools.

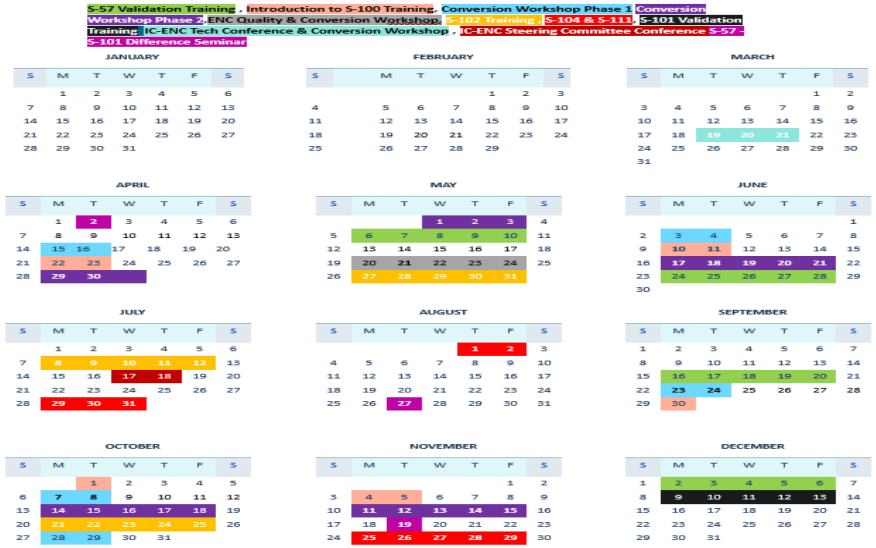
Conversion Workshop

IC-ENC supported the IHO-Singapore Innovation Lab Conversion workshop by part funding this important initiative. 24 delegates attended and 19 of those were IC-ENC Members.

Feedback and lessons learnt will be shared at our Technical Conference in March 2024.

2024 calendar

2024 is a busy year with IC-ENC training events!



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Learning Cloud Environment – recent developments

IC-ENC have created a learning cloud environment using Azure Labs.

This cloud will contain software from SevenCs, Lloyds Register (dKart), CARIS and Esri to enable Members to learn on their S-1XX journey

In this cloud Members will be able to take part in learning activities and not be tied to the office / and or a certain computer.

This will bring inclusivity to our Members, not only in face-to-face learning, but virtual learning too.