

**15th MEETING OF THE IHO INTER-REGIONAL COORDINATING COMMITTEE
IHO-IRCC15
Tokyo, Japan, 12-14 June 2023**

Report of the Worldwide ENC Database Working Group

Submitted by:	Chair, WENDWG
Executive Summary:	WENDWG Annual Report to the IRCC
Related Documents:	None
Related Projects:	None

Chair:	Dr John NYBERG, USA
Vice-Chair:	Ms Annika AXNE-KINDEBERG, Sweden
Secretary:	Yves GUILLAM, IHO Secretariat
Memberships:	Open to all Member States, representatives from each RENC, representatives from each RHC, representatives from the HCA, and a representative from the IHO Secretariat

1. Meetings Held During Reporting Period

WENDWG13 – 21-23 February 2023 – Aalborg, Denmark

2. Work Program

Accomplishments 2019 - 2023

The WEND WG took stock of its accomplishments during the 2019-23 period, covering the entirety of the COVID-19 pandemic. It was noted that the group was an early adopter of working virtually and managed several high-level accomplishments without letting deadlines for completing tasks slip. Versions of both the WEND100 Principles and Implementation Guidelines were completed and endorsed by their respective higher bodies, a WEND IGIF Matrix was drafted for helping to ensure best practices for S-100 products were being considered, overlaps and gaps were managed and addressed in accordance with normal WEND procedures, RENC coordination continued, S-101 scheming guidelines were considered, and progress on INTogIS has remained robust. Most importantly, the WENDWG has transitioned its focus from pure S-57 to the S-100 world.

RHC Participation

The WENDWG depends on Member States, through the RHCs, to coordinate ENC and now S-100 services worldwide. The WEND has had some difficulty realizing RHC participation and reporting. During this reporting period, the WEND received 9 reports on important matters in the regions. This type of coordination will only become more important as we transition to the full suite of navigationally focused S-100 products and services. It should be noted that reporting on the WEND IGIF Matrix (more information below) was received by a similar number of RHCs. For those who did report, the production and coordination of S-100 products and services was being considered and remained a concern for many and overlaps and gaps were mostly reported as low or medium risk.

According to its current ToRs and RoPs in force, the “*WENDWG shall comprise...representatives from each RHC...*”. The WENDWG requests that the IRCC encourage more robust RHC Chart and S-100 Coordinator participation and reporting to the WENDWG.

WEND-100 IGIF Product and Service Matrix

During WENDWG 12, the WG agreed to build a WEND-100 Product and Service Matrix (Annex C) to help ensure that UN-Integrated Geospatial Information Framework pathway principles are being considered as new S-1xx products become available. The Matrix, which is not an end in itself, aims to assist Regional Hydrographic Commissions in ensuring that good practices, including, finance, data, standards, innovation, policy and legal, governance (as not all S-100 based products can be developed by hydrographic offices) and institutions, partnerships, resources, training and capacity building and communications are all being considered. The Matrix was developed in accordance with the UN GGIM’s IGIF nine strategic pathways.

The WENDWG evaluated the results of the Matrix during WENDWG 13 and noted several challenges including response rate, complexity, and question clarification. The Group received Matrix responses from 8 of the RHCs and realized an average total score of 45.85. If the HCA input is removed, the average score was 41.89 (out of 100).

The Group decided to ask RHCs to update their input every two years and recommended that this responsibility would align well with the S-100 Coordinator role.

WEND-100 Principles and S-1xx Implementation Guidelines

No significant work was done on the WEND-100 Principles or S-1xx Implementation Guidelines during this reporting period. The WG considers both of these documents to be in “maintenance mode” and will include them as part of the regular agenda to consider updates as S-100 products and services mature.

S-128

The WENDWG had a lengthy discussion regarding the importance and future of S-128, recognizing that it will be an important product specification for the WENDWG to consider due to its relationship to the future of RENC operations, the management of real time services, and the potential it has for application across various distribution platforms. The WENDWG intends to work on a joint concept paper with NIPWG/S-100WG on the operational use of S-128.

INToGIS III Development

The WENDWG commended KHOA and other contributors on the work done to date on the development of INToGIS II. The Group agreed to promote the submission of S-128 test data sets to KHOA for use in INToGIS III and endorsed the strategy and timelines proposed by KHOA for development. The WENDWG noted the importance of INToGIS III for sharing S-100 product coverage through S-128 and was pleased to note the timeline for providing S-100 global coverage by the end of 2023. The WG also was pleased to note, and thanked, US-NGA’s contribution to INToGIS II, weekly updates of the World Port Index and the Global Maritime Traffic Density Service.

Chart Scheming Update

Following WENDWG 12, the S-101 Scheming Guidelines Project team was placed on standby, where it remains. The WG still cannot find common ground for pursuing a global common grid scheme, so it has decided to task RHC Chart/S-100 Coordinators with reporting their planned S-101 chart schemes for each region, usage bands 1 – 4. The Group requested that submissions use INToGIS III if and when it is commissioned.

S-100 Coordinator

The WENDWG noted that many of the RHCs have not yet established the S-100 Coordinator roles and would like the IRCC/RHCs to consider how the S-100 Coordinator role will be implemented and what their responsibilities will be. Some may view it as an expansion of the Chart Coordinator role,

while others may view it as an entirely new function. The WENDWG considered that an amendment to include a Section 300 in S-11 Part A would be an appropriate place to present the S-100 Coordinator duties and suggests that the WENDWG liaise with the NCWG to consider amending S-11 as appropriate (Post WENDWG-13 meeting note: one option could be for the NCWG to be tasked to revise current Section 200 to include S-101 Scheming, and WENDWG to consider the development of a new Publication S-xx which could be named *Guidance for the Preparation and Maintenance of S-100 Products Schemes in RHCs*).

Draft S-100 Coordinator Responsibilities

- Keep an inventory of S-100 products in the region.
 - Producer
 - Status, in progress, complete, availability
 - Potential additional producers of product
- Work to ensure that Regional MS understand what S-100 products are available
- Update the WEND100-IGIF Matrix on a biannual (every 2 years) basis
- Report regional S-100 status to WENDWG
- Provide input to the WENDWG on RHC preferences regarding WEND-100 Principles
- Help to communicate latest WEND-100 Principles updates to RHC
- Work to coordinate new S-100 products according to WEND-100 Principles (as they are developed), following overlap, distribution and other guidance as it is agreed

Terms of Reference

The WENDWG completed a significant update of its Terms of Reference (Annex A) to reflect its new and expanded responsibilities regarding the S-100 world. The WENDWG also agreed to involve subject matters experts and stakeholders more often in WENDWG meetings.

Program of Work

The WENDWG recognizes that the Program of Work (Annex B) needs to be updated but requests that the update be made after the new ToRs are recognized as in force.

3. Progress on IRCC Action Items

IRCC14, Action 13: WENDWG to provide the template for SPI 1.3.1.

The WENDWG has completed the first run of the WEND IGIF Products and Services Matrix. We consider that the Matrix will provide a snapshot of IHO Member State readiness to manage S-100 products and services through their full lifecycles. About ½ of the RHCs responded to the current iteration of the Matrix, so the aggregated SPI 1.3.1 does not reflect the readiness level of the full IHO membership. If the current results were to be used, noting the following constraints/modifications; 50% response rate and excluding HCA and MSDI reporting, the 2023 score would be 41.49 of a possible 100.

4. Problems Encountered

RHC participation is an item of concern. This is likely due to the return to normal from COVID, but it would be valuable for the RHCs to help ensure WENDWG participation through the Chart or S-100 Coordinator. This participation was also noted in the WEND IGIF Matrix response rate.

The WG still cannot find common ground for pursuing a global common grid scheme. RHC Chart/S-100 Coordinators have been tasked with reporting their planned S-101 chart schemes for each region,

but this will also be contingent on active participation from the RHCs. Without an agreed upon way to measure global progress on S-101 chart implementation, it will be difficult to report progress.

5. Any Other Items of Note

In order to ensure business continuity and a smooth transition, Mr Jens Schröder-Fürstenberg (BSH, DE) and Mr Jason Scholey (UKHO, UK) were elected as Chair and Vice-Chair respectively, with date of effect to take office on 1 July 2023.

6. Conclusions and Recommend Actions

Refer to report item 8.

7. Justifications and Impacts

No additional items to report.

8. Action Required of IRCC

- a. Note the 2019-23 accomplishments of the WENDWG
- b. Recommend that RHCs prioritize their participation in the WENDWG through the RHC Chart Coordinator or S-100 Coordinator
- c. Note the results of the WEND-100 IGIF Matrix, as of February 2023 and encourage the WENDWG to use it as a tool for monitoring the S-100 implementation, for each S-100-based top priority product, per RHC.
- d. Recommend that RHCs, if not done already, establish the S-100 Coordinator role or assign S-100 Coordinator duties as appropriate
- e. Recommend the RHC S-100 Coordinators to update their WEND-100 IGIF Matrix submissions every two years and share their schedule and roadmap to meeting the 2026 IMO target (S-100 ECDIS) at every WENDWG meeting
- f. Note the impending importance of S-128, its relationship to the WENDWG and the joint concept paper with NIPWG/S-100WG
- g. Commend KHOA for the progress on advancing INTToGIS III and encourage Member States to submit their S-128 test data sets for use in it
- h. Recommend that RHC Chart Coordinators/S-100 Coordinators report their planned S-101 chart schemes, usage bands 1 – 4, by 30 September. Request that submissions use INTToGIS III when commissioned.
- i. Approve the proposed Terms of Reference (Annex A)
- j. Note this report

ANNEX A**WORLD-WIDE ELECTRONIC NAVIGATIONAL CHART DATABASE WORKING GROUP (WENDWG)****Terms of Reference**

- Ref: 1) 1st IRCC Meeting (Monaco, June 2009)
2) 5th IRCC Meeting (Wollongong, Australia, June 2013) – Approval of amendments from WENDWG3
3) 9th IRCC Meeting (Paramaribo, Suriname, June 2017) – Alignment with the amendments to the Convention on the IHO (IHO CL 41/2016 refers)
4) 10th IRCC Meeting (Goa, India, June 2018) – Expansion of the scope
5) 11th IRCC meeting (Genoa, Italy, June 2019) – Support of the S-100 Implementation Strategy
6) 15th IRCC Meeting (Tokyo, Japan, June 2023) – Upgrade to incorporate S-100 implementation

1. Objective

- a. The purpose of the WEND Working Group is to advise IRCC to enable the highest societal value of Member State effort by:
 - i. Facilitating a world-wide consistent level of high-quality, updated official S-57 and S-101 ENCs, and ENDS (as well as other S-100 products and services), once those products reach operational maturity, through integrated services that support chart carriage requirements of SOLAS Chapter V, and the requirements of the IMO Performance Standards for ECDIS.
 - ii. Reviewing options, and recommending actions, that expand the value of the Worldwide ENC Database and S-100 product and service stack to all marine data users applying data management principles.
 - iii. Supporting the S-100 based products and services implementation strategy.
 - A. Aiding IRCC in reporting on measurement and progress toward its assigned Strategic Performance Indicators (SPI), through appropriate tools.

2. Authority

- a. This WG is a subsidiary of the Inter Regional Coordination Committee (IRCC). Its work is subject to IRCC approval.

3. Procedures

- a. The WG should:
 - i. Monitor the development of adequate ENC and S-100 product and service coverage to meet carriage requirements for ECDIS.
 - ii. Develop proposals:
 - A. for speeding up ENC and S-100 production;
 - B. ensuring uniform ENC and S-100 product and service quality and consistency;
 - C. making data available worldwide;
 - D. taking advantage of any offers for production assistance, or other ways of mutual assistance and cooperation.
 - iii. Advise MS, where appropriate, on the need, as well as on methods and tools for validating the data, and on any assistance which could be offered by the RENCs.
 - iv. Monitor the implementation of the WEND, in response to Decision 21 of the XVIIth IHC, and advise IRCC of appropriate measures for speeding-up the implementation process.
 - v. Support Regional ENC Coordinating Centres (RENC) cooperation and operations.
 - vi. Maintain the WEND-100 Principles and the Guidelines on the Implementation of the WEND-100 Principles, as appropriate, in order to support the production and dissemination of S-101 ENCs and other S-100 products and services.
- b. The WG should conduct its business by correspondence to the maximum extent possible, including but not limited to email, virtual meetings, or teleconferences. However, the group will plan to meet in-person annually.
- c. The date and location of WG meetings should normally be announced by the Chair by the end of the previous meeting.
- d. All members shall inform the Chair in advance of their intention to attend meetings of the WG.
- e. Decisions of the WG shall be made by consensus.
- f. The draft record of meetings shall be distributed by the Chair (or the secretary) within six weeks of the end of meetings and participants' comments should be returned within three weeks of the date of dispatch. Final minutes of meetings should be posted on the IHO website within three months after a meeting.
- g. Drafting groups and other project teams may be created by the WG or proposed to IRCC to undertake detailed work on specific topics.

4. Composition and Chairperson

- a. Membership of the WG is open to all Member States of the IHO. The WG shall comprise representatives from IHO Member States, representatives from each RENC, representatives from each RHC¹, representatives from the HCA, other subject matter experts as deemed appropriate by the IRCC; and a representative from the IHO Secretariat. The IHO Secretariat will also provide a secretary. A membership list shall be maintained and posted on the IHO website.
- b. Expert Contributors may be invited to join the WG or present at WG meetings as required, according to the task at hand. Expert Contributors shall be invited by the Chair.
- c. The Chair and Vice-Chair shall be representatives of IHO Member States and shall be decided by vote of the IHO Member States present and voting at a meeting. The election of the Chair and Vice-Chair shall be decided at the first meeting after each ordinary session of the Assembly. If the Chair is unable to carry out the duties of the office, the Vice-Chair shall assume the Chair with the same powers and duties.
- d. The requirement for the continued existence of the WG shall be reviewed at each meeting of the IRCC.

¹ Up to RHCs, but preferably ENC and S-100 Coordinators

ANNEX B

WENDWG Work Programme 2023-24 (Note: WENDWG Work Programme for 2024-25 to be aligned with new ToRs once approved at IRCC-15)

Objectives (WENDWG TORs Ed. 2019 refer)

1. Monitor the development of adequate ENC coverage to meet carriage requirements for ECDIS;
2. Develop proposals for speeding up ENC production and ensuring uniform ENC quality and consistency, and for making data available worldwide, including SENC distribution, taking advantage of any offers for production assistance, or other ways of mutual assistance and co-operation;
3. Advise MS, where appropriate, on the need, as well as on methods and tools for validating the data, and on any assistance which could be offered by the RENCs;
4. Monitor the implementation of the WEND, in response to Decision 21 of the XVIIth IHC, and advise IRCC of appropriate measures for speeding-up the implementation process;
5. Assist in harmonizing the policies of regional ENC Coordinating Centres (RENC) with respect to matters related to administration, legality, finances, technical processes, et cetera.
6. Develop options to expand the value of the Worldwide ENC Database to all marine data users applying data management principles
7. Develop WEND-like Principles, if appropriate, in order to support the production and dissemination of S-101 ENCs and the first generation of S-100 based products

Tasks

A	To assess overlapping ENC data issues within ECDIS and make progress to solve them
B	To finalise paper on Guidelines on Assessing and Eliminating the Risk of Overlapping ENC Cells
C	To progress on RENC Harmonization Issues
D	To continue working to attract ENC producer nations to join the RENCs or distribute their ENCs through a RENC
E	To ensure data quality and consistency
F	To monitor and report ENC coverage report to WENDWG
G	<i>Left blank intentionally</i>

H	To maintain IHO ENC Coverage Catalogue and progress the development of INToGIS III aiming to include the catalogue of S-100 Products & Services
I	To provide support on capacity Building activities, as appropriate
J	<i>Left blank intentionally</i>
K	<i>Left blank intentionally</i>
L	To support non-ECDIS maritime community through license management of ENC data
M	To support Seabed 2030 Initiative
N	To prepare the WEND-100 Principles and associated Guidelines as key component of the Roadmap for the S-100 Implementation Decade

Work Item	Title	Priority H-High M-Medium L-Low	Next Milestone	Start Date	End Date	Status P-Planned O-Ongoing C-Completed S-superseded	Contact Person(s). Participants	Deliverable	Remarks
B.3	Monitor the implementation of the IHO Resolution on the Elimination of overlapping ENC data in areas of demonstrable risk to the safety of navigation	M	WENDWG14	2018	Permanent	O	Chair, RHCs, RENCs, IHO Sec	<i>Attention raised by SAIHC</i>	IHO Resolution 1/2018 in force (IHO CL 19/2018 refers). <i>Specific attention to S-101 (outcome of S-57 conversion process in overlapping areas)</i>
B.4	<i>Make available a Worldwide AIS traffic density database to the IHO Member States through the IHO GIS System (INToGIS II,...)</i>	M	--	2018	2022	C	<i>US, ROK, IHO Sec.</i>	<i>INToGIS II additional layer at the disposal of ICGWs</i>	<i>For ENC gap coverage assessment. US NGA leads. Information paper on this layer to be provided by US NGA before layer is commissioned.</i>
C.2	Report on RENC Harmonization issues and progress made	M	WENDWG14	--	Permanent	O	RENCs		<i>Pending for 2023. EAHC-RECC contribution received.</i>

Work Item	Title	Priority H-High M-Medium L-Low	Next Milestone	Start Date	End Date	Status P-Planned O-Ongoing C-Completed S-superseded	Contact Person(s). Participants	Deliverable	Remarks
D.3	Monitor ENC Producers who distribute their ENCs through a RENC	M	WENDWG14	2014	Permanent	O	RENCs, RHCs, IHO Sec.	Updated ENC Data Flow Diagram (EAHC RECC now included)	IHO CL 59/2014 refers. Done for 2022.
F.1	Monitor global and regional S-57 ENC Coverage	M		2014	Permanent	C	UK, RHCs	Annual statistics	Reports are now made by RHCs Rep. at WENDWG meetings
F.2	Using risk assessment methodologies, identify and consider S-57 ENC Gaps	M		2014	Permanent	C	RHCs, IHO Sec.	Improved coverage (and supporting survey plans where needed)	To be continued and improved by RHCs. Reports are now made by RHCs Rep. at WENDWG meetings
F.3	Update the List of Ports (and moorings) database	M	WENDWG13	2014	Permanent	O C	US, ROK, RHCs	API with INToGIS II	New World Port Index Database (US NGA leads)

Work Item	Title	Priority H-High M-Medium L-Low	Next Milestone	Start Date	End Date	Status P-Planned O-Ongoing C-Completed S-superseded	Contact Person(s). Participants	Deliverable	Remarks
F.4	Provide relevant SPIs in support of the IHO Strategic Plan 2021-2026	M	WENDWG13	2021	Permanent	⊖ C	tbd	IHO Annual Report	On hold (waiting for IRCC instructions). Proposal by IHO Secretariat planned at IRCC Workshop (April 2022) on SPI 1.2.2.
H.1	Continue the maintenance of the IHO ENC Coverage Catalogue	H		2014	Permanent	O	IHO Sec., UKHO, RENCs		
H.2	Monitor the development of INTogIS III as part of the IHO GIS Infrastructure	M	WENDWG14	2021	2030	O	ROK, IHO Sec.		Action WENDWG11/14. Compliance with S-128. Action WENDWG12/23
H.3	Develop approved ENC schemes in every charting regions (S-57 ENCs, now including S-101 ENCs), at least for small scales	H	WENDWG14	--	Permanent	O	RHCs	ENC Schemes available online through INTogIS III	Top priority identified in C-1, no progress, put on hold until S-101 becomes a reality.
I.1	Provide support to CBSC on request for compelling requirements in the scope of the WENDWG activities	M		2015	--	P	RHCs		As appropriate

Work Item	Title	Priority H-High M-Medium L-Low	Next Milestone	Start Date	End Date	Status P-Planned O-Ongoing C-Completed S-superseded	Contact Person(s). Participants	Deliverable	Remarks
M.1	Consider supporting the Seabed 2030 Initiative through the IHO DCDB with ENC data	M		2018	Permanent	C	ENC Producers, RENCs	Bathymetric information extracted from RENC databases	Action WENDWG9/12- Call for IBCSO ver.2 made in 2021
N.2	Propose the new WEND-100 Principles to the approval of Member States	H	IRCC-13, then C-5	2020	2021	C		IHO Resolution in M-3, and component of Roadmap for the S-100 Implementation Decade	Annex A of WENDWG Report to IRCC-13
N.3	Develop S-101 ENC Scheming Guidelines	H	WENDWG14	2021	2024	O	JP leading drafting group	Guidelines	On hold until reports received from RHCs. Action WENDWG12/12 and /13 On standby.
N.4	Maintain S-1xx Implementation ENC Guidelines	H	WENDWG14	2021	2024	O	Chair	Guidelines	Fruitful discussion at WENDWG12

Work Item	Title	Priority H-High M-Medium L-Low	Next Milestone	Start Date	End Date	Status P-Planned O-Ongoing C-Completed S-superseded	Contact Person(s). Participants	Deliverable	Remarks
N.5	Contribute and propose amendments to the Roadmap for the S-100 Implementation Decade	M	IRCC16	2021	Permanent	O	Chair		Done in 2021. To be considered in 2024 (INToGIS III, etc.).
N.6	Monitor WEND100 –IGIF Matrix per Region /per S-1xx Product) for the S-100 Implementation	H	IRCC-14 /WENDWG-14	2022	Permanent	O	Chair		Decision/Action WENDWG12/33
N8	Develop new IHO Publication <i>Guidance for the Preparation and Maintenance of S-100 Products Schemes in RHCs</i>	M	WENDWG14	2024	2026	P	Chair/Vice-Chair/Sec	S-xx	rather than S-11 Part A Section 300. NCWG to revise Section 200.
N9	Monitor RHCs plans to meet the 2026 IMO target (S-100 ECDIS)	H	WENDWG14	2023	2026		RHCs Reps.		