

37th North Sea Hydrographic Commission Meeting

Report of the Worldwide ENC Database Working Group (WENDWG)

Submitted	Helen Wojcik, NSHC WENDWG Representative
Related Documents:	Final minutes and Actions of IRCC-14 and 6th IHO Council Actions and Decisions

Chair:	Mr Jens SCHRÖDER-FÜRSTENBERG (Germany)
Vice-	Mr Jason SCHOLEY (United Kingdom)
Secretary	Assistant Director Yves GUILLAM (IHO Secretariat)
Member States, RHCs and RENCs:	Membership

WENDWG is a subsidiary working group of the Inter Regional Coordination Committee (IRCC). The purpose of the WEND Working Group is to advise IRCC to enable the highest societal value of Member State effort by:

- 1) Facilitating a world-wide consistent level of high-quality, updated official S-57 ENCs through integrated services that support chart carriage requirements of SOLAS Chapter V, and the requirements of the IMO Performance Standards for ECDIS*
- 2) Reviewing options, and recommending actions, that expand the value of the Worldwide ENC Database to all marine data users applying data management principles and*
- 3) Supporting the S-100 based products implementation strategy.*

Meetings Held During Reporting Period

WENDWG14, Norfolk, Virginia, USA, 20 - 22 February 2024

Programme of Work

The following key issues were discussed and are summarised in more detail further within this report:

- S-100 Implementation and Coordination
- Expectations from Mariners and End-User Service Providers on ENDS Provision
- Review of important matters raised by RENCs on S-100 Implementation
- S-128 discussions and INTOGIS III
- Guidelines on the Implementation of the WEND100 Principles and the IHO Strategic Plan
- ENC Scheming Guidelines

1. S-100 Implementation and Coordination

The WENDWG noted the progress and concerns raised by the representatives of RHCs. For RHCs to coordinate within their nuanced regions different approaches have been taken and still being taken to coordinate future S-100. The readiness state per region still heavily relies on individual member states and working groups within RHCs. WENDWG agreed on the outcome of the survey issued by WENDWG CL 01/2023 (readiness level estimate ~53%) using a basic statistical approach. IHO Secretariat will

include this decision for the IHO Annual Report 2023.

It was agreed to continue the calculation of SPI 1.3.1, until 2026. As a consequence, the WENDWG agreed to make the annual fulfilment of the WEND100-IGIF matrix by RHCs optional only, since it remains a useful reference / checking list for S-100 implementation and exchange of best practices. WENDWG Chair to issue a follow-up survey on the readiness level of ENC Producing Member States, in November 2024 for calculating SPI 1.3.1 (2024) in preparation of the IHO Annual Report, and WENDWG-15 meeting.

The WENDWG also agreed to report on this outcome to IRCC for consideration by the CBSC in order to orient some CB support in S-100 to IHO MS under RHCs coordination, preventing the IHO from failing the commitments against the IMO. Noting the complexity of the S-100 ecosystem, the WENDWG also invited the RHCs Representatives to consider more carefully the possibility of developing a capabilities-based approach at regional level.

Concerns were raised by various RHCs and MSs regarding S-101 spec still being in draft. Future delays in finalization will lead to HOs not being able to produce S-101 by Jan 2026 as vendors need time to implement the specs into software. The WENDWG Chair to discuss a possible management plan with S-100WG and report concerns to IRCC-16.

S-100 Communication Strategy – it was agreed that there was a need to consider the development of a communication strategy towards end users, manufacturers, IMO, addressing readiness and expected geographic coverage of S-100 based products and data services in the following years, from 2026 onward. The WENDWG Chair to seek guidance from IRCC-16.

The WENDWG noted the simple business model proposed by the EAtHC for the implementation of Phase I S-100 Products in Region G. The NSHC WENDWG representative will work with NSHC ICCWG Chair to confirm regional approach and report at the next WENDWG meeting.

2. Expectations from Mariners and End-User Service Providers on ENDS Provision

Furuno and ChartWorld provided presentations on what they saw as the expectations from Mariners and End Users.

Hannu Peiponen from Furuno spoke about future needs for distribution of S-100 products, Within the "S-57 only ECDIS" period all information for ECDIS originated from HO and the arrival of Dual-fuel S-100 ECDIS adds a lot of new original sources of information. The new issue being how to arrange all this. From an ECDIS user point of view the solution has to be simple to manage, preferably limited number of service providers and a clear method to know, if parallel availability (when to use S-101 or S-57). Reality Furuno see is that provision of S-57 ENC charts will continue as long as there is no declared sunset. A generic selector "always use S-57" or "always use S-101" will not be fit for purpose and the selection method should be machine-managed (or at least machine-assisted). The method in the S-98 Annex C will be based on available meta data, for example included in S-63 "PRODUCTS.TXT", S-128 and Metadata from each S-57 or S-101 cell. These details are totally unclear and not yet set which makes a challenge for development.

Furuno also shared points around GUIDANCE GIVEN BY IMO FOR TRANSFER OF INFORMATION and that the IMO has a plan to require implementation of IEC 63173-2 SECOM as mandatory method for exchange of S-421, is SECOM the way to implement worldwide standardization for the delivery chain. Should product transfer be pushed from shore to ship or pulled from ship. Is it a variation of both? Furuno have a Vision of a standardized service for ECDIS but there are still too many unknowns. The WENDWG agreed to recommend to the IRCC, that the S-100 Roadmap should highlight that the S-100 strategic approach to support and attract end-users for the IHO is not to complete the full S-101 coverage first, then consider the other products, but to engage the IHO into the development of a new distribution model, including cybersecurity and integrity measures and ensuring that end-users can easily access and get all S-100 Phase I products and ENDS in confidence along a given route.

Emma Wise from ChartWorld shared a paper and invited discussion on the necessity to revolutionise

the distribution and data value chain for the provision of data for navigation in both SOLAS and non-SOLAS markets. ChartWorld covered points around Services should not be limited to ENC's – the entire S-100 product line needs to be made available; at least for Phase 1 of the S-100 product group. S-100 only partially solves the problem of the separated components of the data service because it must consider the design of the visualisation systems and likely due to the S-100 framework being based on a classical mindset. The ideal solution for the above issues would be to tie all the components together and provide the best-integrated data optimal for use in a modern visualisation system. Basic postulates for the integrated solution potentially are:

- All source and raw data effecting navigation are stored in a central database at HO or data producer level. All S-100 products derived from such database should be consistent. For example, Navigational Warnings should be consistent with ENC's.
- Data production tools should connect to the database and process different data layers, making them consistent and validated.

This went on then into topics around the Distribution methods, Update routine, Liability, Product and Data Value Chain expectations.

The WENDWG noted the vision on standardized services for ECDIS by Furuno and the recommendations related to the implementation of pull-mode cyber secure options from different sources of information using the SECOM interface (IEC 63173-2) on the Maritime Connectivity Platform for instance. The WENDWG Chair to report to IRCC on the need, at least, to raise the awareness of the IHO on "collateral" issues, acknowledging that are certainly not in the remit of the IHO itself.

3. Review of important matters raised by RENCs on S-100 Implementation

The WENDWG commended IC-ENC and PRIMAR for their ongoing support to WENDWG. Reports were presented from both RENCs on activity ongoing for S-100 Service and completed over the last year.

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 described how their Electronic Chart Data (ECD) Service (Its purpose is to enhance safety of navigation in a nation's waters) is increasing in folio size, with 24 active participants and further members set to join during 2024. Appointed companies receive ENC's and use this data to build their own services to vessels navigating electronically but not using an ECDIS.

IC-ENCs S100 Services are continuing with Conversion Readiness Service to its Members to ensure that S-57 ENC's are optimised for conversion to S-101. 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 things are all discussed through technical workshops, virtual and in country training sessions as well as e-learning provided through its LMS.

IC-ENC has developed 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 for 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 is 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 and an Exchange Set Service tool integrated into the IC-ENC workflow tool for the generation of S-100 exchange sets and digital signing

PRIMAR explained the extended scope continuing the cooperation between PRIMAR, CHS and CARIS related to production, management, and distribution of S-100 products. Expanding the S-100 Service with data from other nations/producers. PRIMAR Production currently has: S-102 - 90 from Norway - 1308 from Canada; S-111 - 1467 from Canada; S-104 - No official data yet. PRIMARS Tests environment contains S-102 - 150 from Norway - 461 from Canada -1 from Latvia S-111 - 3 from Norway - 1347 from

Canada - 1482 from USA - 29 from Taiwan S-104 - 56 from Canada.

New functionality for automated quality control and visualisation of S-101 data (From S-101 Conversion Task Force Project). Includes: Dual-management and operation on S-57 and S-101 datasets. Overlay and quality control S-57 and S-101 datasets and review of conversion results. ALL files in exchange set and service files digitally signed. – All signatures compliant with S-100e5.2. – ENC S-101e1.x will be digitally signed using S-100e5.2. – S-57 datasets will be signed/encrypted using S-63. PRIMAR Advisory Committee (PAC) has decided that PRIMAR will not support SENC/System Database distribution of S-100/S-101 data. Loss of signature file through SENC/System Database distribution is regarded as critical by PAC.

There is a separate project for signature service established, which will trace authenticity of dataset all the way back to producer. PRIMAR will provide functionality to digitally sign all S-100 datasets on upload. Every HO and PRIMAR will have a unique digital certificate for signing purposes. Automatic and switchable if HO provides digital signatures. Configuration will require approval from every HO. If dataset is not signed by producer, PRIMAR will digitally sign dataset. If dataset is signed by producer, PRIMAR will: Re-sign dataset and create exchange set where dataset contains both HO and PRIMAR signatures. The HO data producer certificates will be included in exchange set.

The WENDWG Chair to report at IRCC-16 on the need and “strategic” importance for IHO MS and RHCs to authorize and continue the provision of their ENC data (such as CATZOC values) - and possibly other S-1xx data in the future, through the RENCs, to the IHO Secretariat for the automated calculation of future SPIs as required.

4. S-128 and INTOGISIII

INToGISIII, which is a key IHO component of the S100 Implementation Roadmap, necessary to provide IMO NCSR with recognized and accurate plans and updates from 2025 onwards. KHOA (ROK) presented an update on the INTOGISIII project progress and announced the implementation delay for MS's and RHC's to be able to experiment a specific interface for S-1xx products aiming to scheme the future coverage of S-100 based products and data services. KHOA to liaise with the IHO Secretariat/WENDWG Chair, to establish a management plan of this INTOGISIII Project and ensure that a solution can be found shortly. Waiting for the commissioning of INTOGISIII, the WENDWG will propose the IRCC to recommend the RHCs to consider using off-the-shelf interim solutions (QGIS), such as that proposed in a mock up from Germany, as an interim option to plan and inform stakeholders.

The WENDWG noted a paper presented by Canada with their vision for an integrated national S-128 catalogue and agreed on the benefits of this concept at national level. Once INTOGIS III (Coverage and Planning Catalogue) becomes operational, and if agreed by Canada, the WENDWG agreed to consider the possibility of testing the interoperability of the Canada Hydrographic Service Catalogue and INTOGISIII. Although there were discussions regarding S-128 as a standard for the Catalogue of Nautical Products and therefore the coordination of different products catalogue at national level, should be assigned under the responsibility of the HOs. WENDWG will consider subsequent amendments to the WEND-100 Principles and the S-100 Roadmap at WENDWG-15. The WENDWG Chair will raise the awareness to IRCC on this important policy issue.

5. Guidelines on the Implementation of the WEND100 Principles and the IHO Strategic Plan

The WENDWG established ad hoc drafting groups for preparing amendments to the Guidelines on the Implementation of the WEND100 Principles and the IHO Strategic Plan

The work undertaken by the ad hoc drafting group looking at S-100 Implementation Guidelines - Strategic Plan focussed on: Work needed on Guidelines for Implementation of WEND100 Principles – The focus on S-1xx and S-128 catalogue - S-102, S-111 Producing Authorities - PCA and national authorities - Phase 1 first, but need to go back to looking at Phase 2 by 2026.

The work undertaken by the ad hoc drafting group looking at S-11 - Part C included - Naming to include ENDS - Focus 1st priority Phase I - To provide a general overview of guidelines that applies to all products, then further section per product (incl. harmonization encoding) - S-100 data flow

diagram to be maintained outside the Guidelines – FAQ’s - A draft was made ready. It was decided to recommend to IRCC, Cc: HSSC and IHO Secretariat that it is more efficient to start drafting an S-11-like Part C4 , without the obligation to go through the NCWG as current custodian of S-11 (Part A).

The WENDWG established an ad hoc S11 - Part C drafting team to develop a proposed Edition 1.0.0 of S-11 Part C, to be submitted to the approval of IRCC in 2025 for testing and experimentation in accordance with IHO Resolution 2/2007. WENDWG Chair to inform the IRCC on the scope and possible list of contents at IRCC-16.

6. ENC Scheming Guidelines

Based on the different presentations offered at the WENDWG13 meeting. Noting the absence of agreement for a global common grid scheme, the WENDWG tasked the WENDWG Members/RHCs Reps to report, for each Charting Region, on their S-101 ENC planned Schemes using INTogIS III, when available. Noting the progress made in the conversion procedures from S-57 ENCs to S-101 ENCs and considering that the majority of ENCs producers will adopt this option, at least for the forthcoming years, the WENDWG agreed to close the task aiming to develop guidelines for S101 ENC scheming along a Global Common Grid.

7. The NSHC is invited to:

- Note: This report and the scope of activity happening at WENDWG.
- Commend: Significant effort and support of the RENCS in supporting Member States to achieve S100 Roadmap.
- Recommend: Member States share S100 coverage with ICCWG/NSHC WENDWG Rep prior to WENDWG15.