

NSHC 36

HSSC Report including update on S-100

Agenda Item C1

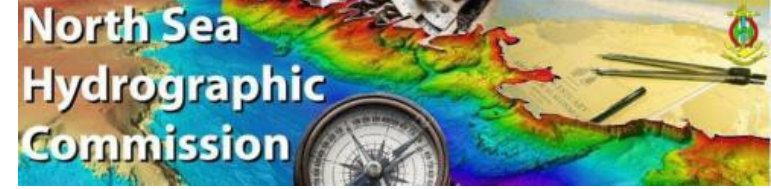


NSHC 36, VTC, 29 – 30 March 2023



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ITEMS TO BE REPORTED



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- The implementation of the Roadmap for the S-100 Implementation Decade (2020 – 2030)
 - Progress in the development of the S-1xx Product Specifications
 - Proposed New IHO Resolution xx/2023 on the S-100 Implementation, A-3 PRO 1.1
 - Amendments to the S-100 Roadmap Annex 2
 - Proposed Annex 4, Dual Fuel Concept for S-100 ECDIS, A-3 PRO 2.1
 - IMO approval on S-100 in ECDIS Performance Standards
- Update on the implementation of the recommendations on the Future of the Paper Nautical Chart
- Other highlights in the ongoing HSSC Work Plan



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PROGRESSES IN THE DEVELOPMENT OF THE S-1XX PRODUCT SPECIFICATIONS

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- The development of the S-1xx product specifications is progressing more or less as expected. Detailed timeline is available in S-100 Roadmap, Annex 2
- HSSC14 approved the first editions (1.0.0) of the following Product Specifications, for experimentation and testing:
 - Interoperability, S-98
 - Water Level, S-104
 - Catalogue of Nautical Products, S-128
- HSSC14 also endorsed new editions of:
 - Management of the S-100 GI Registry, S-99, edition 1.1.0. Approved by IHO Member States by IHO CL 39/2022.
 - S-100, edition 5.0.0. Approved by IHO Member States by IHO CL 45/2022.
 - Bathymetry, S-102, edition 2.1.0. Approved by IHO Member States by IHO CL 40/2022.



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NEW IHO RESOLUTION ON THE S-100 IMPLEMENTATION

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- As a consequence of the introduction of S-100 and following an A-2 proposal (PRO 2.3) by the ROK. HSSC14 endorsed the amendment of four IHO resolutions.
- IHO MS subsequently adopted these amended resolutions.
See IHO CL 38/2022.
- In addition HSSC proposed to Council-6 an overarching IHO Resolution on S-100, embracing concepts and pathways depicted in the S-100 Roadmap.
- The proposed new Resolution will also reference the IMO Resolution on ECDIS Performance Standards and the in force dates agreed upon.
- The proposed new resolution was endorsed by C-6 and subsequently Council submitted the resolution for approval by A-3. See A-3 PRO 1.1.



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FUNDAMENTAL CHANGES IN S-100 ECDIS

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- The single layer official S-57 ENC's will be replaced by multiple, interacting layers of navigational data
- The S-101 ENC will always be the navigational base layer
- In the draft IMO ECDIS Performance Standards the term *Electronic Navigational Data Service (ENDS)* is used for the multiple layers to be used in S-100 ECDIS
- ***Electronic Navigational Data Service (ENDS)*** means a special-purpose database compiled from nautical chart and nautical publication data, standardized as to content, structure and format, **issued for use with ECDIS by or on the authority of a Government, authorized Hydrographic Office or other relevant government institution**, and conforming to IHO standards; and, is designed to meet the requirement of marine navigation and the nautical charts and nautical publications carriage requirements in SOLAS regulations V/19 and V/27. **The navigational base layer of ENDS is the Electronic Navigational Chart (ENC).**
- S-98 is the product specification which will handle how multiple layers are portrayed and how alarms are triggered. The concept was endorsed by C-6. See also A-3 Council Report.



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S-98 : A CORE COMPONENT OF S-100

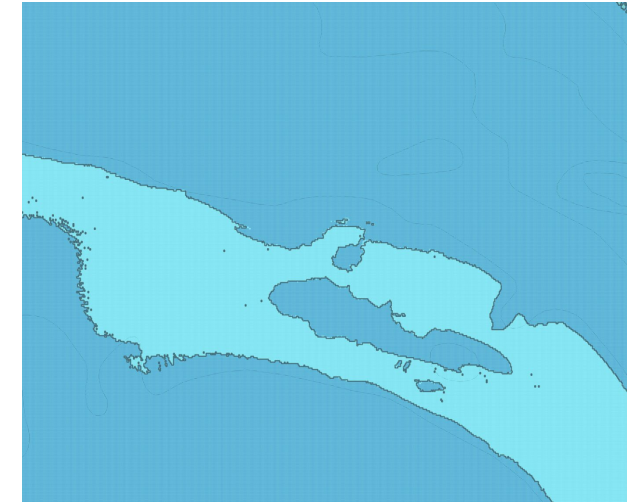
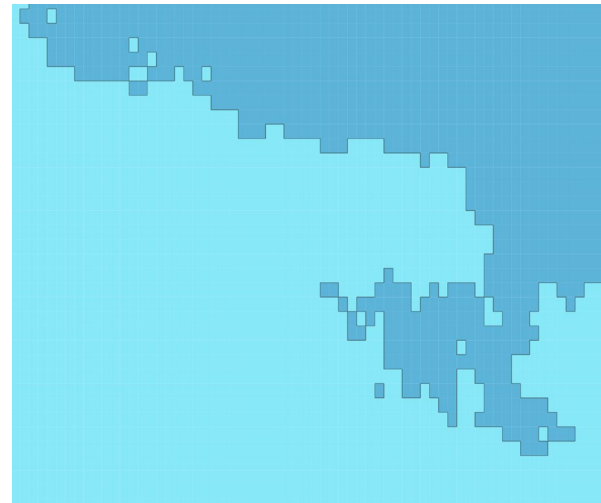
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Example 1: High density bathymetry (S-102) replaces soundings in the ENC. Depth contours are re-computed based on S-102.

S-102 contains a grid of depth values with no predefined contours

S-98 defines how to draw a safety contour on a grid of S-102 depths

These generated depth contours with associated depth areas suppresses the S-101 depth contours areas

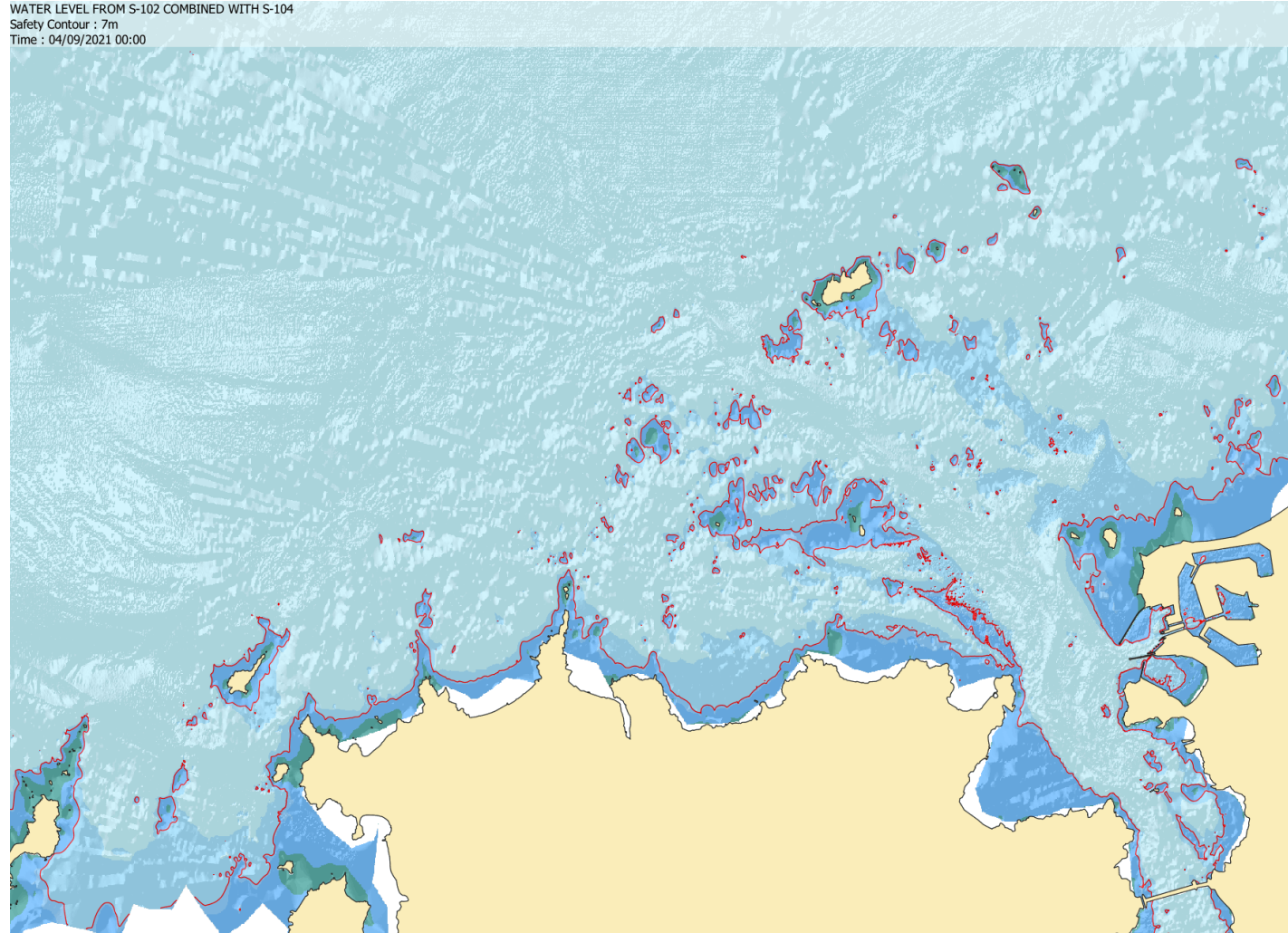




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Example 2 : S-98 defines how to apply Water Level Adjustment using S-104



Safety Contour 7m. The safety contour changes are based on S-102 bathymetry and Water Level Adjustment (WLA), using S-104, over a period of 21 hours.



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CATALOGUE OF NAUTICAL PRODUCTS, S-128

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- The scope of S-128 has changed from a pure catalogue of products to both a catalogue of products and a service to provide a machine readable way to verify the up-to-dateness of the data in ECDIS
- This comes with an extended responsibility placed on data producers and may move the production of S-128 from optional to mandatory to fully provide the end users an accurate report of up-to-dateness of the onboard data
- NIPWG in liaison with S-100WG provided an input paper to WENDWG13 regarding responsibility of stakeholders in producing and dissemination of S-128 data
- The role of the RENCs must be considered in regards to S-128



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THE S-100 CRITICAL FRAMEWORK

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- It has become evident that increasing support is needed to develop the framework in accordance with the S-100 timeline and even in some cases to speed up this development.
- The critical S-100 framework consist of:
 - IHO Geospatial Information Registry
 - S-98 Interoperability Specification
 - S-100 Universal Hydrographic Data Model
 - S-128 Catalogue of Nautical Products
 - S-164 Test Data Set for S-100 and ECDIS Type Approval
- IEC has made clear that the development of these product specifications are especially important for them in order to revise their ECDIS Test Standard (IEC 61174) to include support for S-100.



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S-100 IMPLEMENTATION PRIORITIES

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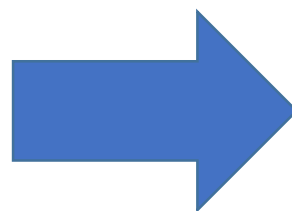
First step

Navigational Route Monitoring Mode

S-101 ENC
S-102 Bathymetry
S-104 Water Level
S-111 Surface Currents
S-124 Navigational Warnings
S-129 UKC Management

Critical Framework

IHO Geospatial Information Registry
S-98 Interoperability Specification
S-100 Universal Hydrographic Data Model
S-128 Catalogue of Nautical Products
S-164 Test Data Set for S-100 and ECDIS
Type Approval



Next step

Navigational Route Planning Mode

S-122 Marine Protected Areas
S-123 Marine Radio Services
S-125 Marine Aids to Navigation (AtoN)
S-126 Marine Physical Environment
S-127 Marine Traffic Management
S-131 Marine Harbour Infrastructure

+ S-100 Products used in
Monitoring Mode



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DUEL FUEL CONCEPT FOR S-100 ECDIS

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- S-100WG has developed a governance document to support the duel fuel S-57 and S-101 support in S-100 ECDIS. HSSC14 endorsed the first edition of the document named *Duel Fuel Concept for S-100 ECDIS*.
- HSSC14 also tasked S-100WG to prepare an Executive Summary of the full report. S-100WG was also tasked to maintain the duel fuel concept and provide updates for endorsement as appropriate.
- It is suggested that the Executive Summary will be included as an Annex 4 to the S-100 Roadmap and the full report as an appendix to annex 4.
- The Duel Fuel Concept was endorsed by C-6 and the Council is now submitted for approval by IHO MS at A-3. See PRO 2.1.



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ADDITIONAL SUPPORT OF THE DUAL FUEL CONCEPT

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- ENCWG has developed a S-57 ENC to S-101 Conversion Guidance which was approved in its first edition at HSSC14. For implementation and testing.
- HSSC14 also tasked the ENCWG to develop an encoding guidance for the backward conversion from S-101 to S-57.
- All these initiatives are aimed to support the transition from S-57 ENCs to S-101 ENCs, so IHO MS can achieve substantial coverage of S-101 ENC in advance of the new IMO ECDIS Performance Standards in force dates.



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IMO APPROVAL OF S-100 IN ECDIS PERFORMANCE STANDARDS

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- The IHO organized drafting group consisted of relevant parts of the HSSC Chair group, CIRM, IEC, INTERTANKO and a few other relevant stakeholders.
- The drafting group was chaired by the IHO Technical Director and a draft redline version was submitted by IHO, cosponsored by CIRM and Intertanko, to the IMO NCSR9 meeting, held in June 2022.
- With the exception of the withdrawal of functionalities for route exchange all other proposed changes were endorsed by NCSR9. The proposal was subsequently approved by IMO MSC106 in November 2022.
- A transition period was agreed upon, meaning that S-100 ECDIS will be legal to use after **1 January 2026** and from **1 January 2029** new systems must comply with the new IMO Resolution on ECDIS Performance Standards.





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S-100 IN THE IMO REGULATIONS AND CONSEQUENCES FOR IHO AND IHO MS

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- Inclusion of S-100 in the IMO regulatory framework is a major success for IHO.
- IHO has now commitments towards IMO and other stakeholders to achieve operational status on the prioritized S-100 product specifications.
- Member States to achieve substantial coverage of S-101 until 2026.
- Active contribution in S-100 related WGs and PTs must be increased.
- The first into force date, 1 January 2026, at the end of the coming IHO work programme 2023 – 2026.
- HSSC invited the Council to recommend to A-3 that Goal 1 and its Targets in the IHO Strategic Plan should have the highest priority in the 2023 – 2026 Work Programme. This priority was endorsed by C-6 and is included as a proposal in the A-3 PRO 1.2 Implementation and Review of the Strategic Plan.



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OTHER HIGHLIGHTS IN THE ONGOING HSSC WORK PLAN

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- The ENCWG has finalized a revision of the Use of the Object catalogue (S-57 Annex A) and the new edition of the ENC Validation Checks (S-58 edition 7.0.0). Approved by IHO Member States by IHO CL 39/2022.
- The new Hydrographic Survey WG is progressing well. HSSC14 endorsed the Hydrographic Survey Standard S-44 Edition 6.1.0. Approved by IHO Member States by IHO CL 41/2022.
- The MASSPT and the S-130 PT have been established and is expected to delivered their final report at HSSC15 in June 2023.
- HSSC15 will take place in Helsinki Finland 5 - 9 June 2023, with one day reserved for a Stakeholder session.



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THE IMPLEMENTATION OF THE RECOMMENDATIONS ON THE FUTURE OF THE PAPER NAUTICAL CHART

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- The NCWG has established a sub-WG (Baseline Portrayal Project Team, BSPT) to develop a Baseline Symbolology aiming to support the automated production of paper charts from S-101 data. In progress since December 2021.
- Some MS argued at HSSC14 that a varied approach might be needed to achieve better guidance on the future of the paper chart.
- HSSC and NCWG is of the opinion that the Chart Specification S-4 gives enough flexibility (“Must”, “Should” and “May” is stated) and that the general approach agreed upon at A-2 2020, regarding paper charts, is reasonable.
- The Council endorsed the offer of the US (supported by AU, DE, DK, KR, and NZ) to document use cases and develop associated guidelines, as well as identify challenges with S-4, to achieve automated production of derived paper charts from ENC content databases and submit them to the HSSC/NCWG for their consideration.



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ACTIONS REQUESTED FROM NSHC 36

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- To note the HSSC Report
- To take any further actions as NSHC deems appropriate



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