S-98 Interoperability Specification

S100WG5 – 5.1

S100WG5 – Taunton, England, 3-6 March 2020

INTRODUCTION

- S100WG agreed to move forward with S-98 Edition 1.0.0 for HSSC endorsement
- BUT
- Still mainly a theoretical specification that needs more testing and development
  - Continue to develop the Interoperability Catalogue
- Work on harmonizing portrayal across products intended to be used in navigation systems
  - Reserved Colours
  - Reserved Symbols
- Development of test data and test cases

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INTRODUCTION

- Proposed that the Experts at the Test Strategy Meeting have an in-depth discussion and provide new recommendations to the S-100WG
- At the TSM a papers were submitted covering the following
  - Re-scoping of S-98 to help mitigate the complex nature of S-98
  - In reality – we are looking at a de-scoping to concentrate on initial implementation of S-98 concepts
  - Intended use of S-98 on navigation systems

FRONT OF BRIDGE/BACK OF BRIDGE

- No longer reference FoB/BoB as it leads to confusion about what data should be available for what type of activity.
- Data should be available for all functions:
  - Planning AND Monitoring
- TSM Recommendation: Remove all references to FoB/BoB from S-98

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DISCUSSION – INTEROPERABILITY LEVELS

- **Level 1** - feature types from different products, including S-101, are Feature layers from other products may be interleaved with ENC feature layers to prevent ENC data from being obscured.
- **Level 2** allows suppression of all features of a specified feature type in a specified product by a feature type from a different product.
- **Level 3** allows feature hybridization – enhancement or combination of thematic attributes. Only thematic attributes can be combined in Level 3. For example, re-calculation of values of a numeric attribute or addition of listed values to an enumeration attribute.
- **Level 4** - drops the requirement for exact coincidence and defines spatially-aware interoperability. Complex spatial queries (INTERSECT, etc.) can be defined to determine related subsets of features, and interoperation

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PRESENTED OPTIONS FOR S-98

1. Move abstract interoperability concepts into S-100. Retain S-98 as an implementation specification.
2. Use specification scopes (defined in S-100 Part 11) to separate interoperability levels (one S-98 document or Part, with 4 scopes).
3. Divide the interoperability specification into separate documents (or Parts) for separate levels.
4. Add a scope conformance clause with a table specifying which clauses (or Parts) of the revised S-98 belong in each scope.
5. Move Levels 3 & 4 into an informative document.
6. Prepare supporting documents: (a) Functional overview; (b) Implementation roadmap.
7. Change the interoperability specification into a guideline & leave technical details to OEMs.

The options are not all mutually exclusive.

RECOMMENDED OPTION TO S-100WG

- Option 1: Incorporate the abstract specification part of S-98 into a new part of S-100 and S-98 stands as an implementation specification
- Rationale:
  - Current S-98 iteration is a mix of abstract specification defining interoperability and guidance on portrayal for interoperability
  - By moving the abstract specification (independent of the design and implementation) to a new S-100 Part it allows S-98 to become a specification that contains the guidance that will tie the various parts of ECDIS operation together
  - It also allows for a home for various elements that are contained within S-52 that do not have a “landing place” in S-100 (or in S-101).

SEA TRIAL EXAMPLES OF INTEROPERABILITY

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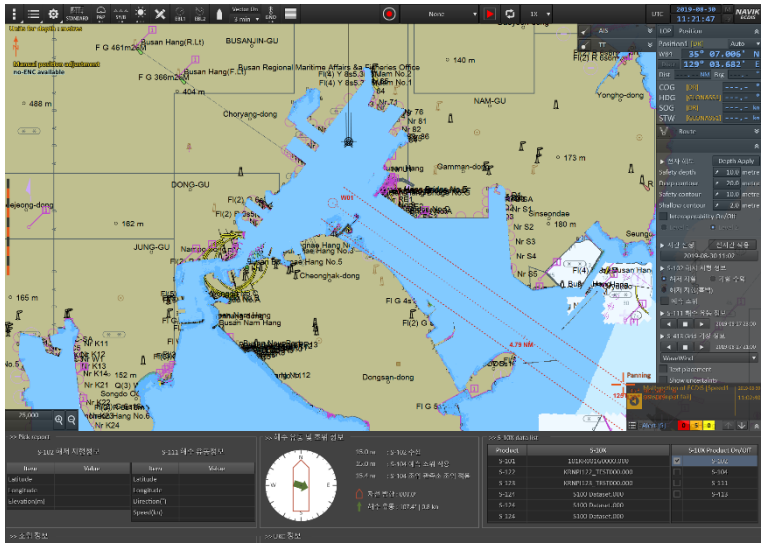
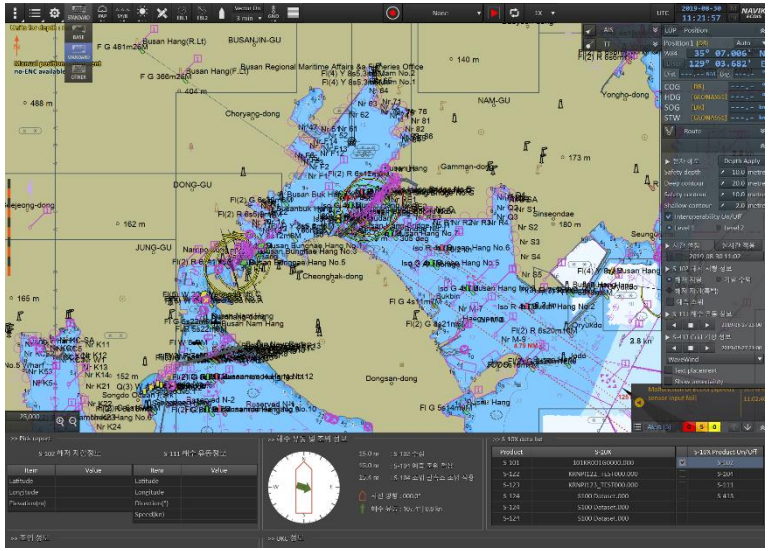
- S-101 and S-102

Level 0



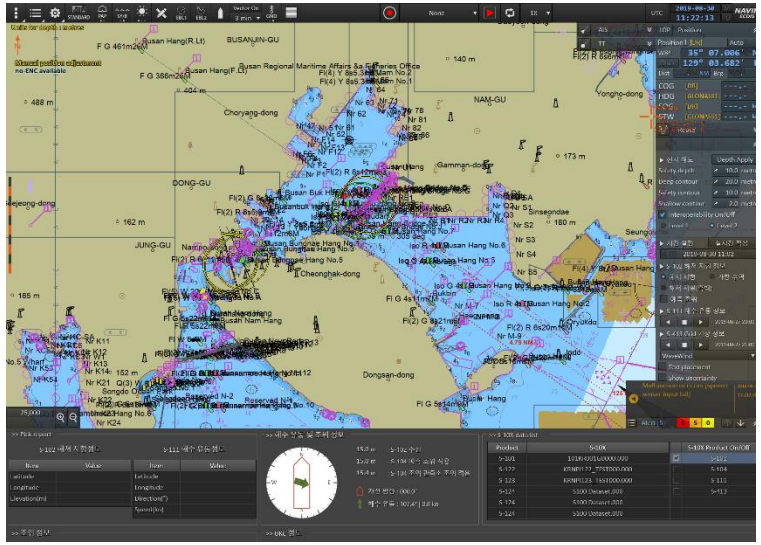
No interleaving

Level 1



Interleaving

Level 2



Replaces the underlying Depth Areas and uses this data to calculate the safety contour/depth

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SUMMARY OF WHAT OPTION 1 PROVIDES

- S-100 Part 16 will be created as an abstract specification of interoperability
  - Contains the UML model and how to create the Interoperability Catalogue
- S-98 Main Document – Describes how the abstract functionalities described in S-100 Part 16 are encoded and implemented
- S-98 – Part A/B/C/D – Describes each interoperability level from 1 to 4
  - Provides the application schema

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OTHER S-98 SCOPE ISSUES

- S-98 will initially focus on the following specifications for navigation systems interoperability

Specification No.	Title
S-101	Electronic Navigational Chart (ENC) / *Cartes électroniques de navigation*
S-102	Bathymetric Surface / *Surface bathymétrique*
S-104	Water Level Information for Surface Navigation / *Information de hauteur d'eau pour la navigation de surface*
S-111	Surface currents / *Courants de surface*
S-129	Under Keel Clearance Management / *Gestion de dégagement sous la quille*

- There needs to be harmonization between this recommendation and the S-100 Implementation Roadmap
  - Includes S-122, S-124, and S-127
- S-98 can be expanded to include additional product specifications after initial operating capability has been achieved

DOCUMENTS DRAFTED IN SUPPORT OF THIS OPTION

- S-100 Part 16
- S-98 Data Product Interoperability (Main)
  - Annex A – Operational Context, Scenarios, and Use Cases
  - Annex B – Validation Checks
  - Part A – Level 1 Interoperability
  - Part B – Level 2 Interoperability
  - Part C – Level 3 Interoperability
  - Part D – Level 4 Interoperability
- Interoperability Schemas and Examples

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ADDITIONAL DOCUMENTATION IN WORK

- Portrayal Harmonization across different S-100 based product specifications
  - S-100 Part 16A or Part 9B?????? S-52 7.0.0?
- Intended to Focus On:
  - Presentational design aspects
  - Display Organization
  - Colors
  - Symbology
- Much of the documentation will come from S-52, such as
  - Design Considerations
  - Clause 3 and 4 etc…

NOTIONAL OUTLINE FOR PORTRAYAL HARMONIZATION

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- Introduction
  - Background; international organizations & type approval, ECDIS concepts & dual-fuel ECDIS display considerations, non-ECDIS applications, etc.
- Display organization
  - Design considerations, kinds of information, operational considerations, user environments, etc.
- Colors
  - Color tokens, profiles, and palettes, color set-asides, color significance, etc.
- Text
  - Considerations for displaying text – readability, quantity of text, etc.
- Vector features
  - Symbolizations, sizes, colors, etc., for vector features.
- Coverages
  - Symbolizations, colors, density, etc., for coverage features.
- Display equipment considerations
  - Guidelines for small features and symbols, physical requirements(?), color considerations(?).
- Other topics?

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RECOMMENDED PATH FORWARD

- S100WG Adopt Option 1 of the S-98 reorganization.
- S100WG review S-100 Part 16, S-98 and its new annexes for comment
  - Due July 30th
- S100WG allows the Test Strategy Expert Group to adjudicate any comments for Part 16 and S-98
  - S-100 Part 16 is included in Edition 5.0.0 of S-100
- S-98 is finalized at S-100WG6 and then forwarded to HSSC13 for approval in 2021
- Continue to draft the portrayal harmonization piece and consider holding a drafting workshop in conjunction with the TSM8 meeting

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ACTION REQUESTED OF S100WG

- Endorse the new methodology for S-98
- Endorse the plan in the recommendations section of this paper or define and alternative plan.