



# 13th Meeting of the Hydrographic Services and Standards Committee, HSSC13

## Validation of S-100-based products New challenges

Agenda Item HSSC13\_PS5

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# Progress of S-100 development

- Good progress during the last couple of years
- Maturity level of S-100 products has improved significantly
- Some products are already tested in operational distribution services

# Status of S-100 Product Specifications

- Current S-100 Product Specifications focus on:
  - Content, encoding structure
  - Rules of portrayal
  - Metadata
  - etc.
- Validation rules are supposed to be included
  - Not available yet, specs have placeholders only
  - Dedicated Sub-Working Groups are dealing with it
  - A long way to go

# Verify and Validate Data, IHO S-65\*

- Procedures to verify and validate ENC cells for content and accuracy
- Ensure consistency with the relevant IHO standards
- 100% check of the vector data against sources
- Validation Software
  - checks on the completed ENC cell, defined in S-58
  - using different supplier to that used for production
  - as last validation step, load ENC cells into an ECDIS

\*ELECTRONIC NAVIGATIONAL CHARTS (ENCs) "PRODUCTION, MAINTENANCE AND DISTRIBUTION GUIDANCE"

# IHO S-100 Implementation Roadmap

- Special focus on the following products:

<b>S-101</b>	<b>Electronic Navigational Chart (ENC)</b>	<b>mandated by IMO</b>
S-102	Bathymetric Surface	optional
S-104	Water Level Information for Surface Navigation	optional
S-111	Surface Currents	optional
S-122	Marine Protected Areas	optional
S-123	Radio Services	optional
S-124	Navigational warnings	optional
S-129	Under Keel Clearance Management	optional

- New validation rules will be required
- For S-101 we can adopt certain rules from S-58
- For other products we must start from scratch

# S-100 key aspect is interoperability

- Today ECDIS uses a single S-57 product only
- Proprietary overlays are vendor-specific
- S-100 ECDIS will support a variety of products
- Use of multiple products simultaneously
- Special interoperability rules are required
- => all this will have an impact on data validation!

# Levels of S-100 data validation

- Generic S-100 checks
  - ISO 8211-related (e.g. record count, dataset structure)
  - HDF 5-related (e.g. general structure, data types)
  - Feature Catalogue (e.g. prohibited features)
  - ...
- Validation checks at single-product level
  - Checks specific to individual products (mandatory features, illegal geometric relationships of features, ...)

# Challenges of S-100 data validation

- Sheer number of new checks that will be required is a challenge in itself
- New types of checks due to interoperability
  - Consistency across products (e.g. ENC vs. S-102)
  - Finding any contradictory information
  - Detecting redundant information
- Creating suitable test datasets
  - test validation checks at single-product level
  - test of interoperability checks
  - may demand greater effort than defining the checks

# Our view from industry perspective

- Risk that the effort required is underestimated
  - Development of checks on different levels
  - Creation of test datasets
- Inconsistencies in validation standards
  - We have seen this in S-58; this must be avoided
- Attribute constraints could be encoded directly into the Feature Catalogue
  - to facilitate the implementation of certain checks
  - e.g. permissible formats for date and time

# Our conclusion from industry perspective

- With more and more S-100 products in place, validation will become a much more complex task than it used to be
- Validation procedures must be suitable to be executed in a variety of operating environments
- Independent data validation must transform from being an isolated procedure into being an integrated process



**Thank You**

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