e-NAV12 Information paper

Agenda item 12.1

Task Number

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Proposals for extending S-100

# Summary

This paper provides an update on efforts towards resolving issues noted in earlier papers on using the S-100 standard [1] for e-Navigation information and describes related proposals for changes to S-100.

## Purpose of the document

This paper is intended to inform the e-NAV Committee about proposals to update the S-100 framework to make it easier to use for non-geospatial information, and invite comments and suggestions on the nature and direction of these proposals.

## Related documents

e-NAV 13/16: The S-100 standard and e-navigation information. Formerly e-NAV11/11/7.

# Background

Paper e-NAV 13/16 described an exploration in modelling largely non-geospatial information using the S-100 standard. Since then there have been various efforts by different parties on developing various S-1xx product specifications, sample datasets for different application areas, and XML encodings. A paper by Jeppesen and the UKHO outlining several possible extensions to S-100 Edition 1.0.0 was discussed at TSMAD 25 [2].

# Discussion

This section outlines the main pending proposals for extensions to S-100 for the purpose of enhancing the framework’s modelling and expressivity. For brevity, some types of extensions, such as new data types, are excluded. Detailed proposals are being developed.

## Proposals

1. Packaging and delivery: S-100 Edition 1.0.0 does not *exclude* information interchange delivery otherwise than as exchange sets (transfer sets), but its focus is on the exchange set model and often this mode is the only one addressed in it. ISO 19109 does conceive of transactional data interchange in addition to interchange by transfer set, including service-centric views (Ref. CEN 15449, ISO 19119, and WFS, WMS, WSDL, SOAP[[1]](#footnote-1)). Additional material for multiple parts of the standard is being developed to clarify that S-100 supports “exchange” and other models, provide suitable adaptations for metadata and data quality information in transactional and service modes of exchange, and specify what is required of product specifications for describing the relevant packaging and delivery.
2. GML encodings: GML encodings and datasets have been developed by various parties for marine protected area information, digital mariner’s routing guides, route exchange, sea ice, in addition to those mentioned in draft product specifications before the E-NAV committee (AtoN, IVEF, marine safety messages). TSMAD is working on a GML profile for S-100, which is now available for review.

Using XML formats invites the question of validation, and whether, where and how provision can be made for XML schema files and validation rules (e.g., Schematron). It will be proposed that S-100 provide for such schemas and validation rules to be provided both locally, as support files in the exchange set, and off-site on the Internet. Product specifications with encodings such as XML must decide whether schemas and validation rules are needed, and where they must be placed. (XML catalogues allow local schema files to substitute for Internet versions of the same.)

1. Domain-specific models: This covers such items as rules, which are difficult to express and encode in a computer-processable manner using the object-attribute approach. It will be proposed that product specifications may add domain-specific models by specifying an alternate formal models (preferably “well-known”, such as ISO or W3C standards), encoding formats, and (if appropriate) portrayal.
2. Spatial objects: Edition 1.0.0 includes point, curve, polygonal surface, and multipoint geometries (and composites). Certain domains such as marine protected areas and marine safety information use other representations, specifically centre-radius areas. It will be proposed that additional types can be added, either as an additional S-100 conformance class (see below) for Part 7 (Spatial Schema) or in individual product specifications. Domain groups with a need will be able to develop proposals for additional geometries.
3. Conformance classes: Conformance classes corresponding to subsets of the standard will be proposed. The general structure will probably consist of core and additional conformance classes, including some with some of the proposed extensions. Initial ideas for the additional conformance classes provide for their use to define conformance with (1) spatial schema and extended spatial definitions, (2) encoding formats – ISO 8211, GML (perhaps at different levels), non-GML XML, and others, and (3) modelling of non-geospatial information using models other than the object-attribute paradigm.

Linking information in different datasets/data streams presents its own set of challenges and is being addressed separately.

## Comments and suggestions

Questions, comments and suggestions are invited and can be emailed to Eivind.Mong@jeppesen.com and Raphael.Malyankar@jeppesen.com. There is no deadline but respondents are requested to send comments and suggestions by April 15, 2013 in order to allow consideration for proposals being prepared for the TSMAD meeting in June 2013.

# References

1. S-100 – Universal hydrographic data model, IHO Special Publication S-100, International Hydrographic Bureau, Monaco, ed. 1.0.0, January 2010.
2. Revisions and extensions to S-100 Edition 1.0.0; TSMAD 25-4.3.2, January 2013. Jeppesen/UKHO.

# Action requested of the Committee

The Committee is requested to:

1. note this paper
2. send formal or informal feedback or suggestions as requested in the body

1. Respectively, Web Feature Service, Web Map Service, Web Services Description Language, and Simple Object Access Protocol. [↑](#footnote-ref-1)