Paper for Consideration by TSMAD29/DIPWG7

Interoperability of S-100 Product Specifications.

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Executive Summary:	Currently there are a number of S-100 based Product Specifications under development which are expected to be used in the next generation of ECDIS as well as in other GIS-based integrated systems. This paper proposes that the S-100 WG should consider what action is required to ensure that S-100 products specification intended for use within the same systems are able to interoperate correctly and safely.
Related Documents:	HSSC6-07.1A, S-100 Master Plan, S-100.
Related Projects:	S-100WG, ENCWG, NIPWG, TWCWG, DPSWG and IEHG[1]

Introduction / Background

1. The International Maritime Organization (IMO) has defined e-navigation as the "*harmonized collection, integration, exchange and presentation of maritime information on-board and ashore by electronic means to enhance berth to berth navigation and related services, for safety and security at sea and protection of the marine environment."* Furthermore the IMO has decided that e-navigation should encompass a data model on all aspects related to the shipping and the maritime domain, and the so-called "Common Maritime Data Structure" should be built on the IHO S-100 data model. The e-navigation Strategy Implementation Plan is based on five prioritized e-navigation solutions among which solution S-4: integration and presentation of available information in graphical displays received via communication equipment. S4 addresses both ship and shore-based users. The implementation of this solution requires to investigate the harmonized integration and portrayal of the various information layers.

Analysis/Discussion

2. Currently several Product Specifications (PS) that are intended to be used in the next generation of ECDIS as well as in other GIS-based integrated systems are being developed by IHO Working Groups and stakeholder organizations. Each of these groups comprise experts within their particular domains, but no single group has a "*birds eye view*" of all of the data products that will have to interoperate within a single system.

3. Task D of the S-100WG work plan 2015-2016 provides for the S-100WG to "[Supervise/Advise] and support the development and maintenance of S-100-based product specifications."

4. It is proposed that the S-100 Working Group considers and proposes to HSSC a work item under task D to carry out a cross domain study of those S-100 PS's that are expected to interoperate within e-navigation systems. The main issues that should be taken into consideration include:

- Data clashes resulting from the inclusion (modelling) of the same real world features in multiple PS application schemas;
- Harmonization of portrayal between different data products, e.g. to ensure that less significant features in one data product, are not displayed more prominently than more significant features in another product;
- Data encryption, authentication, and the data supply chain (e.g. the management of PS updates, provision new datasets and the management of feature and portrayal catalogue updates);
- Testing procedures, to ensure that data products are, not only tested against their own performance criteria, but also tested against their intended interaction with other data products;

Impact on standards and guidance documents such as S-100, the master plan for the development and implementation of S-100, and product specifications templates.

Conclusions

5. The implementation of the IMO e-navigation strategy requires the development of data products based on S-100 that will have to interoperate within integrated shipborne and shore based systems. Most of the underlying PS's (which

[1] Inland ENC Harmonization Group (IEHG)

are now fairly mature) have been developed by domain experts and there is a need to determine how they will interoperate within a single system.

Recommendations

6. In order to identify potential interoperability and data supply chain problems with the data products that are being developed for use by the next generation ECDIS and other e-navigation systems, it is proposed that the S-100 Working Group considers and proposes to HSSC a work item on studying those product specifications that are intended to interoperate within e-navigation systems taking into account the items raised in section 4 above, and any other issues that it considers relevant.

Justification and Impacts

7. It is proposed that not carrying out the study could result in the need to make significant adjustments to Product Specifications after they are first published, and this will result in delays to the development of the next generation ECDIS and more generally to the implementation of the e-navigation strategy.

Action Required of S-100WG

8. The S-100WG is invited to:

a) Consider this paper;

b) Develop and propose to HSSC a work item on studying those product specifications that are intended to interoperate within e-navigation systems and developing the appropriate guidance and recommendations;

c) Take any other actions considered necessary.