

Joint TSMAD18 & DIPWG1 MEETING4th to 8th May 2009 (Ottawa, Canada)**Inclusion of Nautical Publications Information in the S-101 ENC Product Specification.**

<i>Submitted by:</i>	IHB (Tony Pharaoh) (comments in blue – Eivind Mong – Jeppeson)
<i>Executive Summary:</i>	This paper presents a mechanism for including Nautical Publications in ECDIS. It is intended for discussion only.
<i>Related Documents:</i>	SNPWG Minutes (when available)
<i>Related Projects:</i>	SNPWG development work.

Introduction

TSMAD are in the process of developing a new ENC product specification based on the S-100 standard. The Standardization of Nautical Publications Working Group (SNPWG) are also working on developing product specifications for delivering Nautical Publications (NP) information to ECDIS.

These concurrent work activities present opportunities for these groups to examine existing practices and procedures, and where appropriate, to propose new constructs that may result in better nautical products and services for the future.

Comment [EEM1]: as well as less duplication of work inside the Hydrographic Office

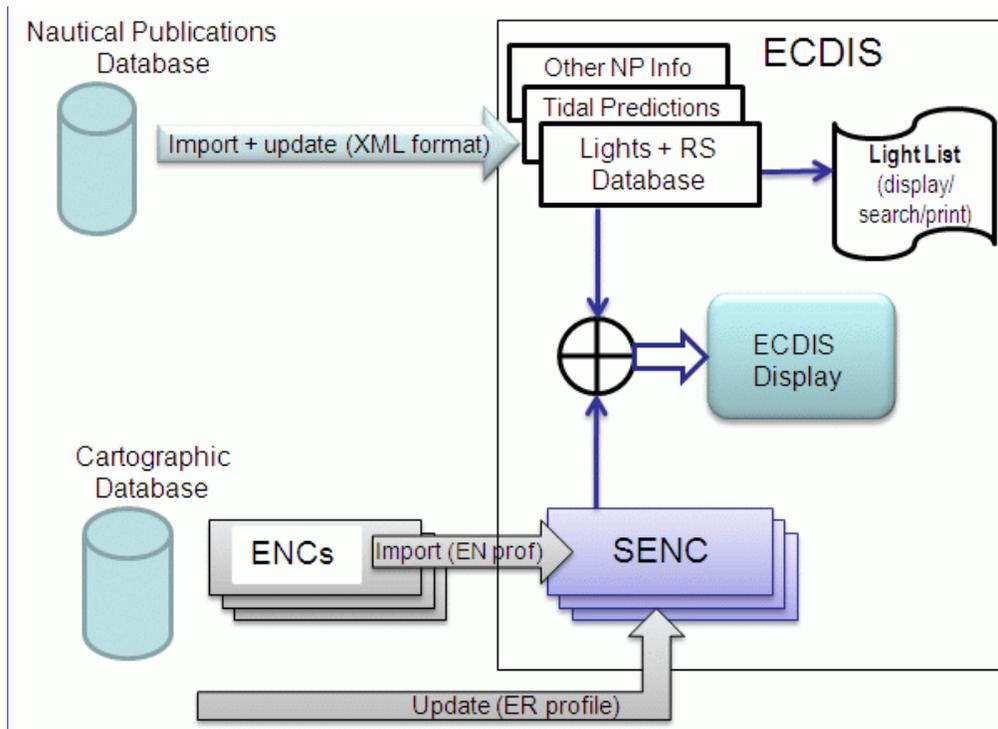
This paper proposes an argument that certain types of cartographic features (such as lights and radio signals) should be excluded from the S-101 ENC product specification, and should be delivered to the ECDIS as separate nautical publications products.

Digitize Once - Use Many

It is estimated that between 60% and 70% of all ENC updates are applied to navigational aids feature such as lights, radio signals and buoys. These types of features frequently appear within multiple ENC usage bands and usually substantially increase the number of ENC updates required. Furthermore, their content usually duplicates information found in associated nautical publications documents such as lists of lights and radio signals, and others.

In view of the product specifications being developed for nautical publications information, it is proposed that all existing cartographic (geo) features that; have a temporal component (e.g. tidal predictions); have simple geometry (e.g. point); are susceptible to frequent update actions (e.g. buoys); and have the same information duplicated in associated hydrographic publications, should be considered for removals from the ENC product specification. It is proposed that these features should be delivered to the ECDIS as separate products and should and should be stored within a NP database (layer). For the purposes of this paper, lights and radio signals are used as examples however this concept could be extended to include other feature classes that have similar characteristics to those described above. Figure 1 below illustrates a possible ECDIS configuration where cartographic (geo) objects are read from a SENC data store, and nautical publications information (lights and radio signal information), from an internal database.

Comment [EEM2]: How about including scale independent features, like TSS, anchorage areas?



Comment [EEM3]: I would actually envision all the different types of data sitting in a "advanced" SENC, but it may be that the amalgamation point you have is what I am thinking of.

Figure 1 – Combining Nautical Publications and ENC data in an ECDIS

The information used to digitize a light feature is often sourced from a nautical publications document (e.g. Light Lists and Radio Signals). These types of features have simple (point) geometry and could very easily be encoded and transferred using an XML or GML (simple features) format. It is proposed that they be held in a separate database within the ECDIS (i.e. there will only be one instance of each light feature held in the database).

Comment [EEM4]: From the figure in the paper, as well as some of the text, it appears that the paper does envisage multiple navigation publications specifications describing different types of publications. This should be made explicit in the text, perhaps by adding a sentence saying so. This would help ensure that future standards consider text-format information as well as geographic feature objects. This may matter because handling information that is mostly text may need a somewhat different approach from handling information that can be encoded into attributes.

Advantages

Improved data management – the duplication of data in disparate databases and overlapping products will be minimized. The data source used (within the ECDIS) to display lights on multiple ENC cells would also be used to generate searches/queries, lists and printouts directly from the ECDIS database. This information will always be the same as what is presented in the SENC.

Distribution – data could be exported for distribution directly from a Nautical Publications database in a compact XML format. Distribution datasets covering large areas (i.e. for a country, continent, or world) could easily be created and exported. Widely adopted standards and protocols that facilitate the distributing of XML via web services have been developed and are freely available. The adoption of industry standards for data transfer could also simplify the present method of ENC distribution and update, and would support the DPSWG work on creating a Data Chain Certification Concept proposed during CHRIS 20.

Updates – instead of having to update several ENC cells and possibly a NP document, it will only be necessary to send a single update to an ECDIS lights database. The update would be very small and would apply to all products that use the database (i.e. all ENCs that display a particular light feature, and all nautical publications lists / searches / printouts generated by the ECDIS).

Portrayal – light features are usually portrayed differently, depending on the ENC usage band within which they appear. As only one instance of each light feature will be stored in the ECDIS database, portrayal information will have to be included in the data structure. This will enable portrayal information (relating to both usage bands and SCAMIN), to be easily distributed and updated.

Comment [EEM5]: Not so sure that the portrayal information must be in the data structure, since all the lights will sit in one layer, it may be more feasible to make conditional symbology procedures for the lights. Although having the portrayal information may give the HO a feeling of more control of the display of the data.

Disadvantages

Nautical publication data (e.g. navigational lights information) will have to be distributed and updated separately from ENCs. This may lead to version discrepancies between products within an ECDIS. It may also add an extra level of complexity for data distributors.

Comment [EEM6]: 1. Keeping the ENC and publications datasets synchronized. For example, Sailing Directions often mention landmarks, lights, hazards, etc., in natural language and sometimes with photographs. Keeping charts and pubs synchronized is an issue even today. If the mariner sees all the data in one presentation (e.g., all of it on the ECDIS or ECS) then keeping the different datasets synchronized may become a lot more important than it is today.

This represents a significant change in the content between S-57 and S-101 ENCs which may cause backward compatibility issues. It should however be possible to resolve this by allowing an S-101 ECDIS to use all feature classes when loading an S-57 SENC; but when loading an S-101 SENC, the nautical publications features described above would be loaded from the NP database.

2. Since encoding some real world entities takes more than one object class (and collection objects), is it possible to make a clean division of S-57 objects into ENC/publications objects? For example the object class "navigation line" (NAVLNE) may be used for encoding leading lines along with light, daymark, special purpose beacon, and perhaps recommended track (RECTRC). Must such linked objects all be in the same dataset, that is, might making LIGHTS a publications object pull NAVLNE and RECTRC into the publications dataset too?

Conclusions

It is proposed that certain ENC feature classes (e.g. lights, radio signals and others) should be removed from the S-101 product specification and should be included in separate nautical publications product specifications.

Furthermore, it is also proposed that the SNP and TSMAD Working Groups should cooperate closely to ensure that their domains of responsibility are well defined and future S-10X products specifications, are well harmonized.

Action Required

The TSMADWG are invited to discuss the following proposal and, if appropriate liaise with the SNPWG to harmonize any further development work..