**NIPWG10\_08.1A**

**Paper for Consideration by NIPWG**

**Presentation of NPUB data within end user systems**

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| ***Submitted by:*** | IIC Technologies |
| ***Executive Summary:*** | An approach for user interfaces for NP product specifications is required. |
| ***Related Documents:*** | S-127, S-123, S-131, S-98 and S-164 |
| ***Related Projects:*** |  |

**Introduction / Background**

A number of IHO product specifications use a convention for modelling rule-based information currently contained in navigational publications. In order to provide an end user with a coherent, understandable interface a processing step may be implemented on the ECDIS. Such processing is currently not part of either S-100 or S-98 Annex C – when such features/information types are presented to the user the values and attribute names shown are those contained in the feature catalogue. Additionally, under the current regime there is no requirement for ECDIS manufacturers to provide any functionality in respect of such data.

In order to provide an adequate, coherent representation of complex structures contained in Navigational publications, therefore, some processing could be standardized at the level of the S-100 framework (i.e. usable for all product specifications).

## Analysis/Discussion

The challenge is more comprehensible when illustrated with actual examples. Two are given in this paper, others have been presented to previous NIPWG VTC meetings. Currently users are faced with a tabular user interface when interrogating features. Portrayal and ECDIS functionality is currently un-modified by any field values within the information types representing the rule structure.

Originally, such computation and intelligent parsing of complex nautical publications data was envisaged to be something on which ECDIS manufacturers could develop themselves, forming a point of differentiation between different systems and adding value to the S-100 ECDIS. This poses both opportunities and problems though. Certainly innovation and intelligent parsing stimulates a great deal of interest in the use of S-100 on ECDIS but a lack of standardization and a diversity of implementations may not be desirable across systems. The user currently enjoys formatted, focused information within existing publications so there is a need to consider how S-100 ECDIS can be similarly user friendly.

There are, therefore, decisions to be made – if there is a desire to provide the end user with such added value data, then to what extent should standardization apply to functionality and portrayal.

An exercise to examine the “art of the possible” in this domain was carried out in late 2022 and presented to end users. Various scenarios were constructed, data prepared and mocked up by “adulterating” the NIWC Shorebased ECDIS screenshots. A number of scenarios were considered, mocking up a user interface based on S-12X data encoded using current versions of IHO product specifications.

The first (and most complex) scenario constructed concerns mandatory ship reporting areas:

1. During planning phase an ECDIS establishes which Radio Calling In Points are within a certain distance of the planned route
2. The Radio Calling In Points are interrogated to see if there is a prescribed reporting process to execute and whether a reporting obligation needs to be satisfied a certain number of minutes prior to arrival.
3. The necessary information for the report is assembled by the ECDIS.
4. During route monitoring at the pre-determined time (i.e. the required number of minutes prior to arrival at the Radio Calling In Point) the user is alerted to the reporting obligation with as much predetermined information as possible.

This scenario uses a number of S-127 features to implement the desired functionality. The rule structure in textual form within the navigational publication is given below:



This is translated a set of interlocking features and information types in the S-127 data. Route planning involves searching for information along a route. The S-127 data structure contains the following information

* **ShipReportingServiceArea** (an area where reports have to be made)
* **RadioCallingInPoints** which are associated with the **ShipReportingServiceArea**
* A **NoticeTime** on the **ShipReportingServiceArea**, so reports have to be made a number of minutes before arrival at the (associated) feature
* **Applicability** which can be used to filter the Reporting obligation by listing the vessel types (and other information) to which regulations apply.

This is based on the following structure (from S-127):



So, the ECDIS:

* Detects the route goes through a VTS Area or ShipReportingServiceArea
* Detects that the Applicability applies to the vessel (using stored information about the vessel)
* Extracts the notice time (if applicable)
* Extracts the report information (from the association with the Applicability)
* Offers the option to add a waypoint with a reminder (using the notice time) and the text / information from the ShipReportingServiceArea

The ECDIS is thus able to “resolve” the rule structure held in the S-127 data and present the user with data which applies in their actual case, filtering out other rules which do not apply to them.

The key questions (for discussion), therefore, are:

1. How should such processing itself be approached by the ECDIS OEM. How much functionality (if any) should be “mandated”, “recommended” or should all implementations (or none) be left to the OEM to design and execute. If this is to be done, then how should any standardization be described (e.g. S-98 Annex C, S-164 etc)
2. If this is not to be done then should simpler encoding be an option for data producers and are these already within the product specifications?
3. What failsafe safeguards are in place to avoid anomalous behaviour caused by either the user or the data producer
4. How can this be approached from a “framework” perspective to avoid product specification-specific elements being hardwired into framework standards like S-100 or S-98 Annex C, i.e. how to avoid “Applicability” being hardwired into either S-100 or S-98 Annex C.

Much of the ECDIS operation on which these scenarios are modelled lies within the “pick report”, although other portrayal aspects could also be developed. However, there is currently no mandatory requirement for OEMs to do anything other than communicate feature content in its original (unchanged) form to the end user during interrogation.

Another simple scenario to be considered is one relating to the “Applicability” of particular features/attributes within nautical publications. The example is prioritizing access to “Contact Details”. The source rule is shown below (from the CCG RAMN publication):



Or, in short:



This rule can would be captured in S-127 using the following features and attributes.

* Applicability would capture the “>300 gross tons” and the date restriction
* A Geographic feature of ShipReportingService Area captures the geographic extent
* Applicability restricts the restriction on the geographic feature.
* Contact Details contains all the necessary contact details for Halifax MCTS

This “could” be automatically parsed by a suitable engine to highlight contact information by using applicability information and assessing whether a particular obligation (or restriction) applies in the case of the end user.

There are other scenarios, such as filtering information in pick reports, and also, tabulating information contained in complex attributes (which has been presented to NIPWG VTC before) to which an approach is required but those contained here present examples where the user may benefit greatly from additional S-100 ECDIS functionality, enabled by S-100 NP data.

## Conclusions

This approach was presented to the S-164 sub working group and NIPWG is now asked to consider two primary items before this item is taken any further for current S-100 ECDIS development.

1. Whether this forms part of ECDIS functionality which requires enhanced standardisation (and thence documentation within S-98 and tests within S-64)?
	1. If so, What form such documentation should take and a technical solution for S-100 ECDIS OEMs?
	2. If not, are alternative encoding methods already available for the product specifications in question, or do they need to be modelled?

## Recommendations

NIPWG works to establish answers to the questions posed and recommend a way forward for the current S-100 ECDIS development as well as “S-100 edition 6” and onwards.

## Action Required of NIPWG

## NIPWG is asked to:

1. Consider the background and content raised in this paper
2. Suggest a way forward which reconciles the current modelling approaches with user requirements and the capabilities of S-100