Paper for consideration by NIPWG

Interoperability and Unique Identifier use for S-125 purpose

Submitted by:	S-125 team within NIPWG
Executive summary:	Adopting the IALA MRN as part of S-125
Related documents:	
Related projects:	S-125

Introduction / Background

At HSSC6, SNPWG proposed a renewal of the international light numbering system to be done in close liaison with the responsible IALA Committee. IALA ENAV17 produced the draft Guideline on Unique Identifiers for Maritime Resources, and a liaison note to PAP introducing the Maritime Resource Name (MRN) as a method for creation of globally Unique Identifiers. The MRN- scheme makes national light numbers globally unique by applying a prefix specified by the guideline. In addition to light numbers, the larger scale use of unique identifiers is a necessary development across e-Navigation to maintain harmonization across domains and services. Navigationally unique objects such as Aids to Navigation, VTS products and services and other maritime resources require identification to avoid duplication and misalignment.

This paper outlines NIPWGs adoption of the MRN with respect to the S-125 navigational services product. It also includes a recommendation that S-101 also adopts the concept of the MRN.

Analysis / Discussion

The structure of MRN implies that the domain owner will be responsible for the data within the given domain. It is thus the domain owner's responsibility to make sure identifiers within the domain are unique.

Adding MRN for Interoperability

The adoption of MRN is to be included in S-100 specification. The MRN needs to be added also to S-101, in order to achieve interoperability benefits for S-125. NIPWG might need to make a proposal for adding MRN to S-101.

Currently S-201 draft includes the attribute ID Code, which is available for all features. The current draft has no references to MRN. Due to the similar structure of the S-101 and S-201 product specifications, inclusion of MRN should be harmonized between the two.

MRN vs. light numbers

Some papers describing the need for unique identifiers are using the terms national and international light numbers, based on recommendations in S-12. The new MRN- scheme extends the use of light numbers to include also navigational aids without lights attached. The MRN- schema is using the identifier "aton" to describe these features, and we could assume there is no distinction made between an aton (structure) and a light (equipment). Whether a unique "light number" is actually given to the structure or equipment is assumed to vary between offices, and the current scheme might be inconsistent even within the Lists of Lights.

For example:
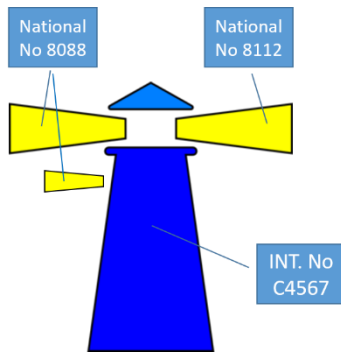
The Finnish List of lights uses national AtoN numbers for describing the lights. If the same structure has a separate daylight, this is described using an additional row in the List of Lights. The second entry is usually not given a separate light number. The same situation might appear, in cases where several individual light are placed in the same structure (position) but used for different fairways, in different directions or showing different characteristics. In these cases, the lights are assumed to be separate lights / aids to navigation, and are given an additional light-number even they share the same structure. The international number for these lights behaves differently. The international number even in these cases is usually the same for all lights within the structure. The national/international light number is thus not always a one-to-one match.

In a real-world scenario, the unique identifier would normally describe the structure (AtoN without light or AtoN with light). In some cases the same structure might be seen as two different AtoN- objects, and in fact have more than one unique identifier, considering the nature of MRN.

Where a S-101 Structure/Equipment feature association is created, there must be only one structure feature related to one or more equipment features. An equipment feature must not be related to more than one structure feature, and a feature must not be both a structure and an equipment feature. If it is required to encode the name of the navigational aid, it must be done using the complex attribute feature name on the structure feature. The name must not be repeated for the equipment features. This guideline could be assumed to apply for MRN also.

When encoding unique identifiers within the structure / equipment setup of S-101 / S-201, the use of unique identifier on the structure would thus imply that the structure features in some cases would be duplicated, and the equipment associated accordingly.

AIS and V-AIS

Virtual aids to Navigation are entering the maritime world. Compared to conventional AtoNs, these have a few additional characteristics:

- AIS is usually part of an AtoN- structure, except V-AIS which does not have a structure.
- V-AIS in particular are assumed to be used for temporary purposes.
- Temporary V-AIS are not always added to charts or AtoN- databases.

In S-101 Physical AIS Aid to Navigation is an equipment feature. Virtual Aids to navigation is encoded without associations to a structure feature. Further excerpt from S-101 DCEG;

"Physical AIS aids to navigation must be encoded, where required, using the geometry of the physical aid to navigation from which the AIS signal is, or appears to be transmitted."

AIS AtoN is also uniquely identified by MMSI- number. V-AIS are still an AtoN and should in this regard be part of the MRN- scheme, in order to be uniquely identifiable between products where it exists.

- Physical AIS- AtoN should inherit the MRN of the structure

- Virtual Ais- AtoN has no structure. In order to add UID/MRN for V-AIS, it must thus be added directly to the *Virtual AIS aid to Navigation* feature. The MRN for a V-AIS might need to be optional.

Persistency

Sometimes the term "Persistent" is used together with the "Unique identifier". Persistency defines the uniqueness over time, and in computer science, persistence is defined as "a state that outlives the process that created it".

The persistency of the unique identifiers will in future be determined within the national authority, responsible of the internal light- numbers. There might be different national approaches to persistency, and reusing of AtoN /light numbers. The concept of persistency might need to be defined, and possibly a guideline made regarding the changes allowed without applying a new number.

- Do we have / need guidelines for reusing AtoN- numbers when significant changes are made to AtoN's

Actions required by NIPWG

NIPWG is asked to;

- Notify and discuss this paper
- Provide additional feedback into the discussion
- Decide whether a proposal should be prepared for addition of MRN into S-101