

## Paper for Consideration by SNPWG18

### Data model related to Lights information

<b>Submitted by:</b>	SHOM
<b>Executive Summary:</b>	Consideration about the data model related to lights for the production of List of Lights
<b>Related Documents:</b>	<a href="#">SNPWG 17.20-1</a> (input from BSH). <a href="#">SNPWG 17.20-2</a> (input from BSH).
<b>Related Projects:</b>	SNPWG data model ; S-100 ; S-101

### Introduction / Background

Lights information is required to be encoded and stored in paper charts, ENCs and List of Lights (LoL) publications.

In most Hydrographic Offices (HO), the data source for light information put in the LoL publications are different from the data source used to populate ENCs or paper charts. The management of 2 (or more) databases related to the Lights information makes the data workflow and processing difficult and leads to discrepancies between information put in LoL publications and marine charts (whether digital or paper).

There is a need to ensure that light information contained in these navigational products is kept current. This implies the use of a common data model and a single data source for light information.

This paper brings forward some considerations concerning a single light information model taking into account the input contributions from BSH at SNPWG17 on this topic. In particular, the completion of existing attributes and the creation of new attributes are proposed.

### Analysis/Discussion

#### Additional formatted attributes

As stated in document SNPWG17.20-2, the current lights model, either S-57 or S-101 based, does not provide all information required to describe lights information entirely. Therefore, the production of a printed or digital List of Lights publication is not possible using the current lights model : new attributes completing the buoys and lights description are needed, in particular for describing lights supports that are not buoys or beacons.

However, instead of adding attributes of string type only as proposed in document SNPWG17.20-2, SHOM is of the view that the new attributes should be formatted (e.g. corresponding to a "list" or "enumeration" type) as much as possible.

Indeed, the use of string (or text) attributes presents the following drawbacks:

- For the same information, different interpretation between database operators : for instance concerning a light located nearby a hut, some will call it "hut" whereas others will call it "lodge" or "shack" or "cabin" . The same holds for a "blockhaus" (blockhouse) which can also be called "bunker".
- Database queries hardly work on string attributes, whereas this is very easy to launch a query on list or enumeration attributes.
- String or text fields -related to a national language- are not interoperable. For instance if a string field "addbld" is defined to provide additional building or landmark description, and if Spain and France exchange lights informations<sup>1</sup>, Spain will not be able to understand the French information in the "addbld" attribute and vice versa.

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<sup>1</sup> Indeed, Spain and France are both producing LoL on some common areas in parts of the North Eastern Atlantic: in the future, instead of managing on both side a lights database covering all their LoL publications, it could be interesting for both parts to manage lights information database on their waters only and exchange lights data on other areas in order to produce their LoL.

For these reasons, the information related to lights and their support should rely as much as possible on lists (or enumeration) attributes. Annex A provides examples of additional feature objects attributes of list type which could be useful. However this proposal is not exhaustive and it is believed that the data model needs further thought.

It must be underlined that the intent is not to prohibit any string attribute from the data model, but only to limit string attributes to the strict necessity, that is, only if it is not possible to dispatch the related information in list and/or enumeration attributes. For instance, in annex A there is a string attribute ("supinf") proposed to bring additional information about the light support.

Dispatching descriptive information in list/enumeration attributes instead of string attributes has some consequences in the LoL appearance: compliancy with S-12 would not be put into question, but sentences will be replaced by a telegraphic style description with comma as separators.

Let's take for example some support descriptions in column 7 of the French LoL:

- currently it can be read text information like "tour carrée verte à côté d'une maison blanche" ("green squared tower near a white house" in English);
- with the data model as proposed in annex A, we will get:
  - o supty=6 (tower, "tour" in French),
  - o supshp=1 (squared, "carré" in French),
  - o COLOUR=4 (green, "vert" in French),
  - o supinf="à côté d'une maison blanche" ("near a white house")

and the information in column 7 of the LoL will be provided like : "tour, vert, carré, à côté d'une maison blanche" ("tower, green, squared, near a white house").

SHOM believes that replacing true sentences by a more telegraphic style in the LoL can be accepted (considering the advantages listed above)..

### Unique light identifier

Document SNPWG17.20.1 propose to create a new complex attribute for light numbers, with a publication ID code, a number and a nation code. SHOM fully supports this proposal.

It must be underlined that this new light number will have some impact on the LoL presentation in the long term. Indeed, within LoL publications the light numbers appear in an increasing order. If several new lights need to be inserted between existing lights, the numbers may possibly be reviewed (though this is not advisable) in order to keep an increasing order. The notice to mariners (NtM) refers to the light number if the characteristics of a light change, and thanks to the light number the user can easily find the light in the LoL.

A persistent unique light number may no longer reflect the order of appearance in the LoL publications, at least in the long term: indeed, eventhough a large "spare room" is proposed between persistent light numbers at their creation (in order to make it possible to introduce new lights), there may come a time when the spare room is not enough to introduce new lights (for instance in case a new harbour is created).

As a consequence, once the persistent light number no longer appear in an increasing order in the LoL, the NtM may need to refer to additional information than the light number in order to enable the user to find precisely where the light location in the LoL.

In short, we support the persistent light number, but we have keep in mind the consequences on the LoL and the NtM in terms of presentation and easy localisation of the light information within the LoL.

### **Conclusions**

The data model related to buoys, beacons and lights need to be developed with new list/enumeration type attributes. On the one hand, list/enumeration type attributes lead to a telegraphic style description in the LoL, but on the other hand, the data information is more homogeneous (operator independent), easy to query and interoperable (between HO, if needed).

The persistent light identifier will provide benefits in terms of data exchange, however the mid or long term impact on the LoL publication (the light order) and the NtM needs to be kept in mind.

## **Recommendations**

To further work on a lights data model taking into account the conclusions mentioned above.

## **Justification and Impacts**

Justifications:

The proposal supports the principle that coastal states are responsible of the hydrographic information on their respective coast. An harmonised data model is necessary to derive any product (marine charts, ENC's and publications) from a single source database. Once this model established, the HO workload would be reduced.

Impacts:

The proposed modifications may have some impacts in the LoL publications as follows:

- telegraphic style (instead of true sentences), in particular for lights' supports descriptions.
- The persistent light identifier released in the first column of the LoL may no longer follow an increasing order. This will have some consequences in the NtM (chapter 3.2) as well.

## **Action Required of SNPWG**

The SNPWG is invited to consider the proposals detailed in this document and to develop a UML conceptual data model related to lights, buoys and beacon.

The consequences on the LoL publications need to be considered as well.

## **Annex A : Proposals for the lights data model extension**

In LoL publications, the lights supports which are not buoys or beacons are described with text.

When corresponding to a landmark, the support can be coded with the LNDMRK class object with the attribute CATLMK defining the nature of support (chimney, mast, ...). However the list proposed in CATLMK is not covering all the kinds of supports, and furthermore the support does not always correspond to a landmark.

Therefore it may be useful to create new attributes which would enable one to describe any light support other than a buoy or a beacon. For instance:

### **suptyp**

Type of support (other than a buoy or a beacon)

Attribute type: simple

Data type: list or enumeration (it depends whether a support can be of several types or unique)

Possible values: 1=hut, 2=building, 3=column, 4=bunker, 5=house, 6=tower, etc ...

... to be completed with all possible values found in LoL publications.

Another possibility is to reuse CATLMK and complete if necessary

### **supshp**

Shape of the support

Attribute type: simple

Data type: list or enumeration

Possible values: 1=squared, 2=circular, 3=pyramidal, 4=...

... to be completed with all possible values found in LoL publications.

### **supmat**

Material of the support

Attribute type: simple

Data type: list or enumeration

Possible values: 1=metal 2=concrete, 3=wood, 4=stone, 5=granite, 6=bricks ...

... to be completed with all possible values found in LoL publications.

### **supinf**

Additional information about the support (most of the time related to the location of the support)

Attribute type: simple

Data type: string

Examples : "located on a square basis", "next to a white house", ...

These simple attributes, which are all related to the support description, could be gathered into a complex attribute "supdsc":

### **supdsc**

Support description

Attribute type: complex

Sub attributes: suptyp, supshp, supmat, COLOUR, supinf