13th TSMAD MEETING
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Draft ENC Encoding Bulletin - Port Entry Lights (PEL)

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The PEL Sector Light is a land-based navigation light which shows a different colour when viewed from different angles. These lights are already in use in NZ and the Panama Canal to mark the required sailing line of a vessel, such as the entry to a port or harbour or passage through a narrow channel.

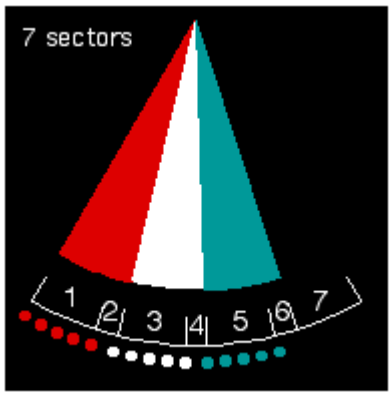
PELs are not that dissimilar to a 'Directional Light' which is already attributable in S-57. The definition of a 'Directional Light', as given in Admiralty Lights List, is *'a light showing over a very narrow sector, forming a single leading light. This sector may be flanked by sectors of greatly reduced intensity, or by sectors of different colour or characteristics'*. S-57 Annex A, Chapter 2 - Attributes, has an attribute value of 'directional function' for the attribute CATLIT which, has the following definition '*a light illuminating a sector of very narrow angle and intended to mark a direction to follow'*. The main difference between PELs and Directional Lights is that PELs use an oscillating feature within the light construct.

It is suggested that PELs could be encoded along similar lines to that which is already used for 'Directional Lights. Clause 12.8.6.1 of Edition 2.1 of the Use of the Object Catalogue (S-57 Appendix b1, Annex A) states *'Each sector in which the light is visible from seaward must be encoded as one LIGHTS object'*.

PELs are manufactured by Vega Industries Ltd and the following encoding examples are based on two of the scenarios outlined on their website (www.vega.co.nz).

Example 1

The diagram below represents a three coloured PEL 'oscillating' across seven sectors. Although it is static representation, all three lights have a constant angle of arc and oscillate across all seven sectors. The red light oscillates through sectors 1, 2 & 3, with a period of darkness in sector 1. The white light oscillates through 3, 4 & 5, and the green through 5, 6 & 7 with a period of darkness in 7.



Applying the rule for encoding sectored lights, as defined in the Use of the Object Catalogue above, each sector must be captured as an individual 'LIGHTS' object, with each light being attributed according to the characteristics of that sector.

There is clearly a requirement for a new attribute value for 'oscillating' lights, especially in sectors 1 & 7. When viewing the light in either of these sectors the characteristics will alter depending on the position of the vessel. The periods of light and darkness change from 'flashing' (darkness > light) to 'occulting' (darkness < light). When positioned in the centre of either of these two sectors the light characteristics are 'isophased' (darkness = light). Until such time as a new attribute value

can be introduced it is proposed that the attribute ‘flashing’ is used.

The definition of alternating lights as defined for LITCHR = 28, i.e. *‘a signal light that shows, in any given direction, two or more colours in a regularly repeated sequence with a regular periodicity’,* would appear to adequately cover the oscillating nature of sectors 3 and 5.

Under these conditions, and using the attributes in the diagram above, the following encoding principals can be applied for this feature across the seven sectors:

S1. Flashing Red: LIGHTS [LITCHR = 2] [COLOUR = 3] [SECTR1] [SECTR2]
S2. Fixed Red: LIGHTS [LITCHR = 1] [COLOUR = 3] [SECTR1] [SECTR2]
S3. Alternating WR: LIGHTS [LITCHR = 28] [COLOUR = 1,3] [SECTR1] [SECTR2]
S4. Fixed White: LIGHTS [CATLIT = 1] [LITCHR = 1] [COLOUR = 1] [SECTR1] [SECTR2] [ORIENT = ?]
S5. Alternating WG: LIGHTS [LITCHR = 28] [COLOUR = 1,4] [SECTR1] [SECTR2]
S6. Fixed Green: LIGHTS [LITCHR = 1] [COLOUR = 4] [SECTR1] [SECTR2]
S7. Flashing Green: LIGHTS [LITCHR = 2] [COLOUR = 4] [SECTR1] [SECTR2]

Example 2

The following example of a PEL, with five sectors, is more aligned to a ‘Directional Light’ and therefore less contentious. There are three colours, red, white and green. The red light has a variable angle of arc continuously displayed in sector 2 but oscillating across 3. The white light has a constant angle of arc and is fixed in sector 4 but oscillates across sectors 3 & 5. The green light has a variable angle of arc fixed in sector 6 but oscillates across 5. Note that none of the coloured lights overlap at any time during the oscillation period.

Under these conditions, and using the attributes in the diagram above, the following encoding principals can be applied for this feature across the seven sectors:

S2. Fixed Red: LIGHTS [LITCHR = 1] [COLOUR = 3] [SECTR1] [SECTR2]
S3. Alternating WR: LIGHTS [LITCHR = 28] [COLOUR = 1,3] [SECTR1] [SECTR2]
S4. Fixed White: LIGHTS [CATLIT = 1] [LITCHR = 1] [COLOUR = 1] [SECTR1] [SECTR2] [ORIENT = ?]
S5. Alternating WG: LIGHTS [LITCHR = 28] [COLOUR = 1,4] [SECTR1] [SECTR2]
S6. Fixed Green: LIGHTS [LITCHR = 1] [COLOUR = 4] [SECTR1] [SECTR2]

Footnote

It may be appropriate to include a new attribute value for LITCHR for ‘oscillating’ lights in S-100. However the attribute CATLIT = 1 appears to cover the function of PELs, with Data Providers able to give clarification of the object in INFORM.

An example of a Directional Light can be found in the following cell:

GB50344C, Position: 53 38.40N; 0 11.97W. Light List Volume A, No. 2491.5. BA Chart 3497, Immingham.