Paper for Consideration by TSMAD27

S-101 Look Up Table Review Progress

Submitted by:	TSMAD Vice Chair
Executive Summary:	This paper is to provide TSMAD with a brief update on the joint TSMAD/DIPWG Look Up Table project for S-101 portrayal
Related Documents:	S-101 TSMAD26/DIPWG5 9.1B TSMAD26 Action 6
Related Projects:	S-101 Portrayal Catalogue Builder

Introduction / Background

At TSMAD26/DIPWG5 it was determined that the DCEG was fairly stable enough to be used as a baseline to begin developing the portrayal rules for the new features/attribute/enumeration combinations that have been developed for S-101. The following action resulted from that meeting:

> DIPWG S-101 portrayal rules Sub-WG to be created in order to develop revised rules for changes to the lookup tables that have occurred as a result of changes in the S-101 DCEG

Analysis/Discussion

Before the sub-WG can start reviewing the proposed new rules there was a large amount of preparatory work that needed to be done. It should be noted that while the portrayal catalogue will be built according to the S-100 model, it was decided to use the look up table format for the first iteration of the new rules development. This methods major benefit is that the proposed rules will initially be in a format that is familiar to the members of the sub-wg.

The first order of business was that a baseline look up table needed to be generated for those items that have been identified as either being new or modified. At the last meeting SPAWAR (US) kindly volunteered to develop the initial look up table rules for those new and/or modified items, and while the work is not yet complete SPAWAR has made significant progress in developing an initial portrayal rule.

SPAWAR has done the initial work for most of the new feature types and additional attributes that have been identified in the S-101 DCEG baseline. Their methodology is as follows:

<u>New Feature Types – AISAidToNavigation example</u>

S-52 does not have an existing symbol defined for AISAidToNavigation, so SPAWAR looked to what existed in INT1 and used the INT 1 symbol name (e.g. INT117.1 refers to the AIS transmitter symbol). In cases where there are multiple symbols defined for a single INT 1 symbol name, they indicate the symbol by appending its position in the list (e.g. INT1Q9-3 refers to an east cardinal mark). So in order to symbolize a physical AIS aid to navigation of type north cardinal, the symbology instruction would be: SY(INT1S17.1);SY(INT1Q9-1).

For the viewing group, they picked the next unused number (mod 10) based on the INT 1 section of the symbol. So for AISAidToNavigation, they selected the viewing group table section “P, Q, R, S BUOYS & BEACONS, LIGHTS, FOG SIGNALS, RADAR” and added ten to the last entry to get 27240.

For the display priority, over-radar, and display category, they looked for items in the same viewing group section for items with similar navigational purposes and chose the value from there. In this case, buoys and beacons had the closest match so they chose display priority of 8, display over-radar, and standard display category.

Since all combinations of AISAidToNavigationType and CategoryOfAISAidToNavigation are valid, there would need to be 36 lookup table entries. Since this this would quickly get out of hand, they adopted the “sub lookup table” technique proposed by Thomas Richardson (UKHO). See the “AIS Aid To Navigation Lookup Tables.doc” file for an example of this.

Modification of Existing Feature Types

For modifications of existing feature types, what is actually needed for the LUT needed to be determined. For instance, S-101 adds the daymark shape attribute to the BCNCAR feature. This allows for symbolization without needing the TOPMARnn CSP. Similarly to the AISAidToNavigation above beacons are encoded using the sub lookup tables as above. Each sub lookup table corresponds to the floating/fixed branch described in the TOPMARnn CSP.

Text Output Changes

In most cases, the formatted text output command (TE) could be replace with the TX command to draw the featureName.displayName directly.

Unknown and Unconverted Entries

Some LUT entries were not converted, these are listed in "Unconverted LUTs.txt" document. These fall under the following categories:

- Unable to determine what changes needed to be made. A good example is the LNDMRK features.
- Non-finalized symbolization such as lights.
- Symbolization of aggregate features such as bridges.

For some LUT entries, specific elements such as display category, priority, etc. could not be determined. In these cases, question marks (?) are put in place of the actual values.

Current Draft Status

So far SPAWAR has completed draft LUT for the following features that are new or have had changes:

New Lookup Table	**Comment**
AIS Aids to Navigation	Note: The two LT commands should be interpreted as the Cartesian product of the associated attributes and as such will cover all 36 attribute combinations.
Beacon	
Buoy Emergency Wreck Marking	
Buoy	
Collision Regulations	
Conveyor	Note: Assuming CONRAD attribute type in S-101 Data Classification and Encoding Guide is supposed to be BO, not C.
Depth No Bottom Found	Note: It is assumed a depth command will be created to display depths. DD(*hjust, vjust*) – Displays the Z value for the given feature's spatial component. • hjust, vjust – Specifies the justification relative to the point. Uses same values as TX command.
Discoloured Water	Note: The area symbology procedures assume the areas are colored by the DEPARE symbology.
Ferry Route	
Floating Dock	Note: The FloatingDock (FLODOC) type exists in S-57 as a line and area spatial type. S-101 adds a point representation. Note: The S-52 LUTs specify over radar for lines and suppressed by radar for areas. I chose over radar here.
Foul Ground	Note: Unsure how to symbolize curves since the S-52 version requires conditional symbology
Gate	Note: Symbolized using navigable lock gate symbol.
Landmark	

Obstruction	
Offshore Wind Turbine	
Pile	Note: The PILPNT02 complex linestyles and area fill commands are high density repetitions of the PILPNT02 symbol.
Pontoon	Note: Not sure at what orientation a point pontoon should be drawn.
Production Area	Note: The two LT commands should be interpreted as the Cartesian product of the associated attributes and as such will cover all 36 attribute combinations.
Slope Topline	Note: Unsure if a complex linestyle is wanted or different line colors.
Text	Note: All of the entries that were changed exclusively to use the displayName attribute are all collected here.
Text Placement	Note: It is assumed that text placement will defer to a custom procedure. That custom procedure will be responsible for setting the text viewing group, display priority, display category and over radar settings. Note: The TextPlacement feature type described in the S-101 Data Classification and Encoding Guide will need some way to specify a text viewing group. This could be an attribute on the TextPlacement feature or possibly an information association.

Recommendations

This paper is for informational purposes only and it is expected that the LUT sub-wg will receive the entire review package sometime in January 2014.

Action Required of TSMAD

The TSMAD is invited to:

Note the paper