Paper for Consideration by S-100WG

S-100 Part 10b GML Profile revision

Submitted by:	IIC Technologies
Executive Summary:	S-100 Part 10b revision intents, scope and content
Related Documents:	S-100 Edition 5.0.0
Related Projects:	S-100 Part 4a Exchange Set Metadata

Introduction / Background

The current GML Annex Part 10b has been revised for S-100 Edition 1.0.0. this paper describes the rationale, intent, scope and detail of the revision.

Analysis/Discussion

S-100 ECDIS is constrained to implement the Part 10b encoding for the support of S-100 product specifications, most notably those defined under NIPWG. The current Part 10b has had a number of implementations in these product specifications during the lifetime of S-100 edition 4.0.0.

For S-100 ECDIS implementation to be successful, all encodings must be unambiguous and as concise as possible to minimise OEM effort and ongoing maintenance. As S-100 is a dynamic standard defining potentially unlimited numbers and variants of product specification it is even more important to ensure what is required for GML implementation is bounded and well defined.

As an S-100 encoding Part 10b is charged with translating S-100 feature based data, conforming to the S-100 General Feature Model (GFM) into a GML compliant form. The S-100 Feature Catalogue for a product specification defines the GFM content required to be expressed by any encoding, and therefore any GML Application Schema should be constrained to the boundaries defined within the applicable feature catalogue. The scope of the GML Part 10b revision is, then, to ensure any developed GML Application Schemas replicate the Feature Catalogue structure in its entirety to avoid any ambiguity in interpreting data when delivered to the implementing system. This tight binding of the GML Profile to the feature catalogue extends to feature and attribute names, types, multiplicities and relationships.

An additional rationale for the definition of the GML encoding was to provide a level of interoperability in S-100 for ease and broader use by implementers. The current profile extends GML though in a number of areas, most notably geometry but also in others (dataset level metadata for geometry counts and other fields). These bespoke S-100 extensions are of little use for broader use as mainstream GML readers are unable to parse them. They have been rationalised in the revision to use, as far as possible, native GML types. In particular geometry has utilised generic GML types where possible. Geometry scale minimum/maximum has been dropped and masking implemented using parallel lists of masked/unmasked GML curves. Should product specification developers require more sophisticated geometric elements then the ISO8211 encoding is able to encode them and should be considered. In an ECDIS context this makes perfect sense as a full ISO8211 encoding will be required by all S-100 ECDIS.

The revision seeks to make the GML Application Schema development more prescriptive by drawing some elements from existing edition 4.0.0 developed schemas and using them in the Part 10b schemas supplied with S-100. This would make the dataset collection feature and supertypes for FeatureType and InformationType mandatory for developing product specifications. The S-100 5.0.0 Part 10b schemas should therefore provide the necessary constraints for development of Application Schemas which are able to be parsed correctly by S-100 ECDIS.

Note: FOR REASONS OF ECONOMY, DELEGATES ARE KINDLY REQUESTED TO BRING THEIR OWN COPIES OF THE DOCUMENTS TO THE MEETING

The final area to receive clarification is where Part 10b offers a choice for particular elements of the implementation. In these cases, a mandatory dataset metadata switch will be included to ensure the implementing system is able to correctly interpret the content. Examples include the conventions for named/generic associations and feature codes versus names for enumeration value specifications.

The aim of these clarifications in Part 10b is to ensure that an implementing system is able to correctly interpret S-100 GML encoded data using only the GML dataset and feature catalogue. The GML Schema itself is then a tool primarily for initial validation of data content.

Relevant comments have been posted on the S-100 WG GitHub site (issue #23 - 6.11 Revision of GML Annex) and working group members are invited to contribute to the discussion. The URL is: https://github.com/IHO-S100WG/TSM8/issues/23

Recommendations

This paper proposes the modifications made to Part 10b the S-100 GML Profile.

Justification and Impacts

S-100 edition 5.0.0 will be the basis for all S-100 ECDIS and will require an implementation capable of reading GML datasets (and accompanying supporting files).

The current Part 10b contains many implementation specific elements which risk mis-interpretation by implementing systems which are not developed against individual product specifications. The revision enables development of systems at an S-100 level by strengthening the normative elements of the profile and constraining development of GML Application Schemas firmly to the GFM structures contained in the feature catalogue.

Action Required of S-100WG

The S-100 working group is asked to:

1. Approve the revisions to S-100 Part 10b
2. Note a separate paper adding GML Schemas to the S-100 Exchange Set contents.