Paper for Consideration by S100WG

Report on ISOTC211 Activities

Submitted by:	IHO Secretariat
Executive Summary:	The ISO/TC211 19100 series of standards and specifications have been used for the development of the IHO S-100 Universal Hydrographic Data Model. This paper reports on the ISO/TC211 activities of relevance to the S-100WG and ENCWG.
Related Documents:	*HSSC8 paper HSSC7-07.7A*
Related Projects:	

Introduction / Background

The International Organization for Standardization (ISO) - Technical Committee 211 (ISO TC211) deals with the development of standards and specifications for the geospatial domain. The International Hydrographic Organization (IHO) is a Class A liaison member of ISO/TC211 and participates in its standards development and maintenance Working Groups. The ISO/TC211 19100 series of standards and specifications have been used for the development of the IHO S-100 Universal Hydrographic Data Model.

Analysis/Discussion

ISO requires that all standards, specifications or other deliverables published by ISO or jointly with IEC should be subject to systematic review in order to determine whether they should be confirmed, revised/amended, converted to another form of deliverable, or withdrawn. The maximum elapsed time before a systematic review for standards is 5 years and technical specifications is 3 years. The following table lists ISO/TC211 documents under review and their work programme target dates.

Bold = Delivered documents

Project no	WG	CD	DIS	FDIS	IS
19101-2 (Rev)	6		2016-12		2017-12
19107 (Rev.)	9	**2015-02** **CD.2 2016-02**	2017-05		2018-05
19111-1 (Rev)	9	2017-05	2018-05		2019-05
19112 (Rev)	1	2017-02	2018-01		2019-01
19115-1 Amd 1	7		2017-01		2018-12
19115-2 (Rev)	6	**2016-03**	2016-07		2017-07
19116 (Rev)	4	2017-06	2018-06		2019-06
19123-1 (Rev)	6		2018-01		2019-01
19123-2	6		2016-12		2017-12
19126 (Rev)	7	2016-12	2017-06		2018-06
19127 (Rev)	9	**2015-06**	**2016-10**		2017-06
19130-1 (Rev)	6		2016-12		2017-12
19131 (rev)	9	2017-06	2018-06		2019-06
19133 (Rev)	10		2018-01		2019-01
19139-1 (Rev)	7	2017-02			TS 2017-06
19142 (Rev)	4		2018-06		2019-06
19143 (Rev)	4		2018-06		2019-06
19146	1	2017-02	2018-06		2019-08
19150-4	7		2018-11		2019-11
19155-2	10	**2014-08**	**2016-05**		2017-02
19157 Amd 1	9		2017-05		2018-05

19157-2	9	**2014-09**			Under
19159-3	6	**2016-08**			TS 2018-12
19160	7	Stage 0			
19160-2	7	2017-06	2018-06		2019-06
19160-3	7		2018-07		2019-07
19160-4	7	**2014-12**	**2016-04**		2017-04
19160-5	7	Stage 0	Review summary 2016-06		
19161-1	4	2017-06	2018-04		2019-04
19165	7	**2016-09**	2016-11		2017-11
19166	10	2017-03	2018-03		2019-03

Table 1

The following new projects have recently been approved:

- ISO 19160-3, Addressing – Part 3: Address data quality. (This standard extends Part 1: Conceptual model, and Part 2: Good practices for address assignment schemes).
- ISO 19150-4, Ontology - Part 4: Service ontology. (This standard extends Part 1: Ontology Framework, Part 2: Rules for developing ontologies in the Web Ontology Language (OWL), and Part 3: Semantic operators).

The following standards were approved to undergo a systematic review: ISO 19118 – Encoding; ISO 19141-Schema for moving features; ISO 19149 – Rights expression language for geographic information (GeoREL) and ISO 19156 – Observations and measurements. The TC agreed that the ISO 19152 (Land Administration Domain Model - LADM) Standard should also be reviewed.

ISO/TC211 Harmonised UML Model

The S-100 model is based on the ISO/TC211 harmonised UML model and incorporates a selection of the TC211 model packages. It extends or constrains TC211 classes for its own requirements and includes an S-100_ prefix where necessary. The latest S-100 UML model is available from the S-100WG Basecamp (https://basecamp.com/) development site.

The ISO/TC211 harmonised UML model can be downloaded from the ISO web site at http://www.isotc211.org/hmmg/HTML/root.html. The ISO/TC 211 have also developed a "UML best practices" WIKI to assist users of the model. (See https://github.com/ISO-TC211/UML-Best-Practices). There is also a discussion forum available at https://github.com/ISO-TC211/UML-Best-Practices/issues) for communities wanting to use the harmonised model. UML is a modelling language which describes packages classes (including their properties and relationships) in a graphical format[i]. In order to facilitate their implementation (e.g. by application developers), ISO/TC211 has also establishing a library of (19100) classes in XML format. It has established an XML schema repository which is available at http://standards.iso.org/iso/19115/resources/namespaceSummary.html. It has also set up a Github[ii] working XML schema repository at https://github.com/ISO-TC211/XML.

In order to ensure that all future 19100 UML models are easily integrated into the harmonised model, the 42nd meeting approved a resolution requiring all project teams to create their harmonized models at an early stage of the standards development phase (resolution 777) so that they can be checked for compliance with the harmonised model.

Although the primary focus of TC211 has been to provide standards and specifications for geographic data, it has (in cooperation with the Open Geospatial Consortium), developed some standards for geospatial web services[iii]. The TC has also recognised that it needs to respond to the development of the Semantic Web (or Web 3.0)[iv] which implies a shift from a "Web of (human readable) documents" to a "Web of (machine readable) data". ISO 19150-1 provides rules for developing ontologies in the Web Ontology Language (OWL)[v]. ISO 19150-2 supports the semantics of geographic information as part of the Geospatial Semantic Web. In response to this requirement, the TC has created a Github repository at https://github.com/ISO-TC211/GOM where harmonised

OWL files can be downloaded. As the Internet coverage and bandwidth improve in port and coastal areas, this will be of relevance to future e-navigation related services and products. It may also be of interest to the IHO S-100 and MSDI Working Group activities. Currently the S-100 standard does not make provision for geospatial web services and it is proposed that this should be considered for inclusion in a future edition of the standard.

Cooperation with the Open Geospatial Consortium

Both the IHO and the Open Geospatial Consortium (OGC) are liaison members of the ISO/TS211. The OGC have recently established a Marine Domain Working Group (DWG) to address interoperability challenges with marine geospatial data. This group will facilitate discussion of the requirements related to exchange methods and formats to ensure that data used for navigation can also be used within the broader realm of MSDI for non-navigational purposes.

The OGC have also initiated a Standards Working Groups (SWG) to explore and propose terms for a standard to enable interoperability through the use of Discrete Global Grid Systems (DGGS). The goal is not to identify one DGGS, but to increase awareness of the advantages of DGGSs in general, to define the qualities of a DGGS, to make them interoperable – with conventional and other DGGS data sources, and to standardize operations on them.

The next (44th) ISO/TC211 meeting will take place in Stockholm, Sweden from 29 May to 2 June 2017. A workshop on "Integrating Geospatial and Statistical Standards" will take place during the meeting week.

Recommendations

It is recommended that, the WG should discuss how it will handle references to dependent ISO standards, noting that the proposed crosswalk mappings will only be included in documents when they go through their next maintenance cycle. Furthermore, the WG are invited to consider whether it wishes to establish a mechanism to update the S-100 models to keep abreast of changes to the ISO models, or whether this will only be considered whenever a new (full) edition of S-100 is produced.

It is proposed that DGIWG and (other standards organizations) will have to consider the same issues, and the WG should discuss a harmonized solution to maintaining compatibility with the 19100 base standards.

Actions Requested

The S-100WG is invited to discuss the issues raised in this paper and take any actions it deems necessary.

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[i] For the purpose of the paper UML refers to structure diagrams (i.e. package, class/structural and object diagrams).

[ii] GitHub is a web-based Git repository hosting service. It offers all of the distributed version control and source code management (SCM) functionality of Git as well as adding its own features. (A "Git" is a version control system that is used for software development and other version control tasks).

[iii] Web Map, Feature, Catalogue, Tile Services.

[iv] The Semantic Web requires data that are understandable and processable by machines. XML is used as its syntactic foundation however it also makes use of other languages and frameworks.

[v] Web Ontology Language (OWL) is a Semantic Web language designed to represent rich and complex knowledge about things, groups of things, and relations between things.