

# FIG STANDARDS NETWORK REPORT TO THE GENERAL ASSEMBLY

David Martin 15 February 2020

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## Standards Network Terms of Reference:

The Standards Network was formed in 2002. It works within Commission 1 and consists of representatives from each of FIG's Commissions. The terms of reference of the Network set out in the FIG Guide on Standardisation are:

- Building and maintaining relations with the secretariats of standardisation bodies,
- Proposing priorities on FIG's standardisation activities, including advising the Council on priorities for spending,
- Setting up necessary Liaison relationships with standardisation bodies,
- Ensuring that lead contacts to Technical Committees etc. are in place,
- Maintaining an information flow on standardisation to FIG members, including through the FIG website, and more directly to relevant Commission Officers,
- Maintaining the Standards Guide, and related material on the FIG website,
- Working with other NGOs, within the framework of the MOUs signed by the Council,
- Advising FIG's officers and members on standardisation activities as necessary.

## Key Activities

The Standards Network covers several key activities. At different periods, the commissions are more or less active or impacted by Standards. Some activities such as ISO 19152 on the Land Administration Domain Model (LADM) or the International Measurement Standard of Property (IPMS) are clearly linked to a specific commission –Commission 7 for the LADM and Commission 9 for IPMS. While other Standards issues relate to, or implicate, or could potentially implicate several commissions. The ISO/TC 211 concerning Geographic Information/Geomatics is an example.

Below is a summary of current Standards activities in FIG.

## ISO/TC 211 Geographic Information/Geomatics

ISO/TC211 – Geographic information/Geomatics is the ISO technical committee dealing with geospatial matters. Larry Hothem is the representative from ISO/TC211 to FIG and Nic Donnelly and Louise Friis-Hansen (on behalf of the FIG office) are the representatives from FIG to ISO/TC211.

### Nic Donnelly reports:

Two plenary meetings were held during 2019, the first in Maribor, Slovenia from 3 June – 7 June and the second in Omiya, Japan, from 9 December – 13 December. The next plenary meeting will be in Helsinki, Finland in June 2020.

There are a number of items on the TC211 work programme that may be of interest to FIG member organizations. For a full list, please refer to the ISO/TC211 website <https://committee.iso.org/sites/tc211/home/projects.html>

Foremost is the work being done on a revision of the Land Administration Domain Model, ISO19152 (see below). The original development of this standard was led by members of FIG Commission 7 and FIG remains heavily involved in the revision, principally through the contributions of Christiaan Lemmen and Peter Van Oosterom. Early work has focussed on determining the scope of the revision, with a focus on extensions to accommodate valuation and taxation components to the data model. Another proposed enhancement is an extension to the survey model to better support the integration of spatial planning with land administration.

Another item of interest is that the development of a new standard for Discrete Global Grid Systems (DGGS), ISO19170, has commenced. This work is undertaken jointly with OGC, which has already published a standard on DGGS. DGGS are designed to support big-data processing at global scales, providing a scalable means of assigning location to data at any desired resolution.

### **ISO 19152:2012 Land Administration Domain Model (LADM)**

This Standard grew out of the Commission 7 work on the Core Cadastral Domain Model. It was accepted into the ISO/TC 211 work programme in 2008. The Land Administration Domain Model (LADM) ISO 19152:2012 Edition 1 was published in 2012. It facilitates the efficient set-up of land administration and can function as the core of any land administration system. LADM is flexible, widely applicable and functions as a central source of state-of-the-art international knowledge on this topic. LADM is one of the first spatial domain standards.

#### **Chrit Lemmen reports:**

The development of this standard was prepared and initiated in Commission 7. The first Edition was published in December 2012. A second edition is under preparation now within ISO TC 211 on Geographic Information.

The proposals for inclusion of new functionality in the LADM and for an extension of the scope were discussed during a TC211 meeting in July 2019 in Maribor, Slovenia. During this meeting, it was decided to publish the second edition in several parts:

- Part 1 – Land Administration Fundamentals
- Part 2 – Land Registration
- Part 3 – Marine Space
- Part 4 – Land Valuation
- Part 5 – Spatial Planning
- Part 6 – Implementations

Each part will be a separate standard and requires a submission of a formal “New Working Item Proposal” (NWIP). It is planned those NWIPs will be submitted by FIG and its commissions. The preparations for those submissions will be discussed during the Standards Network Meeting in Amsterdam in 2020. It is important to organise this in cooperation with UN GGIM, World Bank, IHO, RICS, etc.

An earlier NWIP submitted in autumn 2018 by FIG concerned the development of edition two as one comprehensive standard. This NWIP is no longer valid.

To start development, a so-called “Stage 0” Document was prepared. After a second TC211 meeting in Tokyo Japan in 2019, this “Stage 0” was distributed for comments and observations by the TC211 members. A substantial part of this “Stage 0” document is also published in FIGs paper of the month of December 2019.

The 8<sup>th</sup> Land Administration Domain Model (LADM) Workshop was held in Kuala Lumpur, Malaysia, 1 to 3 October 2019. The proceedings are available at <https://wiki.tudelft.nl/bin/view/Research/ISO19152/LADM2019Workshop>

A special issue on the Land Administration Domain Model of the International Scientific Journal “Land Use Policy” is under preparation. Apart from this many scientific publications on LADM are published in the Journal, also in 2019: <https://www.journals.elsevier.com/land-use-policy>

Preparations with the Open Geo-Spatial Consortium on LADM operationalisation are ongoing. There were meetings on this issue in Leuven, Belgium, in June 2019 and in Toulouse, France in November 2019.

## ISO/TC 172 SC6 Survey Instrument Standards

ISO/TC 172 SC6 provides a comprehensive coverage of standards related to surveying instruments and their accessories including: handheld laser distance meters, levels, theodolites, EDM measurements to reflectors, total stations, GNSS field measurement systems in real-time kinematic (RTK), terrestrial laser scanners etc...

Standards and/or project under the direct responsibility of ISO/TC 172/SC 6 Secretariat (17)

ISO 12858 *Series Ancillary devices for geodetic instruments*

- ISO 12858-1:2014 Part 1: Invar levelling staffs
- ISO 12858-2:1999/Amd 1:2013 Part 2: Tripods
- ISO 12858-3:2005 Part 3: Tribrachs

ISO 16331 *Series Laboratory procedures for testing surveying and construction instruments*

- ISO 16331-1:2017 Part 1: Performance of handheld laser distance meters
- ISO 16331-2 Part 2: Terrestrial laser scanner [Under development]

ISO 17123 *Field procedures for testing geodetic and surveying instruments*

- ISO 17123-1:2014 Part 1: Theory
- ISO 17123-2:2001 Part 2: Levels
- ISO 17123-3:2001 Part 3: Theodolites
- ISO 17123-4:2012 Part 4: Electro-optical distance meters (EDM measurements to reflectors)
- ISO 17123-5:2018 Part 5: Total stations
- ISO 17123-6:2012 Part 6: Rotating lasers
- ISO 17123-7:2005 Part 7: Optical plumbing instruments
- ISO 17123-8:2015 Part 8: GNSS field measurement systems in real-time kinematic (RTK)

- ISO 17123-9:2018 Part 9: Terrestrial laser scanners

ISO 9849 *Series Geodetic and surveying instruments*

- ISO 9849:2017 Vocabulary

There are 13 participating and 10 observing members of ISO/TC 172 SC6.

**Ingo Neumann is the representative to ISO/TC 172 SC6. He has provided a summary of the most important (current) work of ISO/TC 172/SC 6. Ingo reports:**

### **Important work on the terrestrial laser scanning standard**

The new standard ISO 17123-9 was published (12/2018) - Optics and optical instruments -- Field procedures for testing geodetic and surveying instruments -- Part 9: Terrestrial laser scanners.

The first feedback concerning the usability and practical experience seems very promising. Depending on the feedback from different organizations, a small revision may be planned in the near future.

The working group for ISO/NP 16331-2 Optics and optical instruments -- Laboratory procedures for testing surveying and construction instruments -- Part 2: Terrestrial laser scanner

The working group is established to work on a laboratory standard for terrestrial laser scanning. Currently, working drafts are discussed, but because of the advanced procedures, a final publication will still take a few years.

### **Distance and angle measurements:**

The ISO 17123-5:2018 is published: - Optics and optical instruments -- Field procedures for testing geodetic and surveying instruments -- Part 5: Total stations. The general procedure is the same, but some formulas are updated and some layout issues are improved.

### **Other important work**

The new Standard ISO 9849 is published – Optics and optical instruments -- Geodetic and surveying instruments – Vocabulary

This standard is maybe important for FIG because it summarizes the vocabulary used in the field of geodetic and surveying sensors. This standard shall be extended to include terms in the area of multi-sensor-systems in the future.

### **International Property Measurement Standards Coalition IPMS**

The International Property Measurement Standards Coalition (IPMSC) is a group of more than 80 professional and not-for-profit organisations from around the world, working together to develop and implement international standards for measuring property.

At present, the way property assets – such as homes, offices or shopping centres – are measured varies dramatically. For example, in some parts of the world it is established practice to include common space (lift shafts; communal hallways etc) in floor area measurements; in others off-site parking might be included or even swimming pools.

With so many different methods of measurement in use, it makes it difficult for property users, investors, occupiers and developers to accurately compare space. Research by global property firm JLL shows that, depending on the method used, a property's floor area can deviate by as much as 24%.

The International Property Measurement Standards Coalition (IPMSC) is an international group of professional and not-for-profit organisations working together to develop and embed a single property measurement standard.

An International Property Measurement Standard (IPMS) will ensure that property assets are measured in a consistent way, creating a more transparent marketplace, greater public trust, stronger investor confidence, and increased market stability.

More information is available on the IPMSC website: <https://ipmsc.org/>

## International Land Measurement Standard (ILMS) – due diligence in surveying:

### **James Kavanaugh reports:**

The ILMS global standard is now live and online. [www.ilmsc.org](http://www.ilmsc.org) Over 40 coalition partners (inc. FIG & CLGE) have joined as well as several industry, government and academic partners. The Standard Setting Committee (SSC) consisted of 14 land expert individuals from around the world. A major ILMS coalition meeting was held at World Bank Land conference 2019 with strong and increasing representation from the francophone, Arabic and central/south America. ILMS is being translated (by native speaking coalition members) into Spanish, French, German, Arabic, Russian, Turkish and even Amharic. ILMS is directly linked to UN Sustainable Development Goals (SDG's) and valuation of unregistered/communal lands initiative. ILMS undergoing a series of rolling launches during 2019/20 with a soft launch at World Bank Land conference 2019 and the Turkish translation launched at CLGE Istanbul in Sept 2019.

## International Construction Measurement Standards (ICMS)

ICMS is a global standard for benchmarking and reporting of construction project cost and covers both capital and whole life costing while providing a way of presenting costs in a consistent format.

Research from the World Economic Forum has shown that improvements in the design and construction process can be achieved by using international standards like ICMS to gain comparable and consistent data. ICMS provides a high-level structure and format for classifying, defining, measuring, recording, analysing and presenting construction and other life-cycle costs.

This will promote consistency and transparency across international boundaries, which in turn will lead to more confidence to increase global investment in construction projects.

More information as well as a download link for the standard are available on the ICMS website: [www.icms-coalition.org](http://www.icms-coalition.org)

## Standards in Hydrography – FIG Commission 4

**Simon Ironside (Commission 4 WG4.3) and Niel Hewitt (Commission 4 WG4.1) report:**

Commission 4's involvement with the update of IHO Document S-44 Standards of Hydrography is now complete. We have reviewed and analysed initial user feedback, contributed technical expertise and advice to the S-44 Working Group and provided feedback on some of the new chapters. I understand the Working Group has submitted it the draft to the IHO and it is (or shortly will be) out for member state consultation

WG4.1 is also an advisory member of the S-100 WG, but we haven't been as active in the formulation of this suite of standards.

Through this work cycle, WG 4.1 will be focussing on hydrographic surveyor competency through the active promotion of certification and assessment as well as offering assistance, advice and guidance on hydrographic standards as requested/required by IHO and other bodies.

## Specific Standards Issues in the Commissions

### Standards issues related to FIG Commission 4

The International Board (IHO, FIG and ICA) publishes guidelines for establishing individual recognition for hydrographic surveyors, at both professional and technical levels, taking into account education and experience.

### Standards issues related to FIG Commission 5

Commission 5 follows ISO/TC 172 SC6 Work on Survey Instrument Standards, and ISO/TC 211 Geographic information/Geomatics.

### Standards issues related to FIG Commission 6

Commission 6 is interested in the ISO TC 172 and the ISO 17123 series of standards related to survey instruments. There is interest in helping to define standards in deformation measurement and monitoring and data analysis. Other points of interest include machine guidance, integrating BIM model and machine guidance, exchange of data etc....

### Standards issues related to FIG Commission 7

Commission 7 is very active – specifically in *ISO 19152 on the Land Administration Domain Model (LADM)*.

### Standards issues related to FIG Commission 9

Commission 9 is the FIG link to the *International Measurement Standard of Property (IPMS)* initiative.

### Standards issues related to FIG Commission 10

Commission 10 is actively involved with the International Construction Measurement Standards Coalition (ICMSC) aiming to develop and implement consistent international standards for benchmarking, measuring and reporting construction project cost.

## FIG 2020 Amsterdam Working Week Standards Network Meeting

The next Network meeting will be held during the 2020 FIG Amsterdam working week.

## Summary

Standards are important in the surveying profession. Standards work in FIG ranges from input to the very specific ISO/TC 172 SC6 Survey Instrument Standards; to liaison with the much broader ISO/TC 211 Geographic Information/Geomatics, which impacts on virtually every aspect of the surveying profession. One very important standard is the ISO 19152 LADM. FIG is involved in the IPMSC coalition, ILMS and IPMS with the aim to develop and implement accessible and appropriate International Standards.

The Standards Network is responsible for building and maintaining relations with the different standardisation bodies, proposing priorities on FIG's standardisation activities and ensuring information flow on standardisation to FIG members. One of the principal ways these goals are accomplished is through a Standards Network meeting held during FIG working weeks and Congresses. In principle, each Commission appoints a representative to the Standards Network to discuss their Commission's interest and requirements in standards.