STANDARDIZATION ON GEOSPATIAL INFORMATION

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Geospatial Information LITD 22

Twin Purposes:

a) To formulate National Standards in the field of Geospatial Information

b) National Mirror Committee for ISO/TC 211
GEOSPATIAL INFORMATION
STANDARDS

At National Level (BIS):

a) Standards formulated : 10+6
b) Standards in formulation : 12

At International Level (ISO):

a) Standards formulated : 94
b) Standards in formulation : 25 (Some are Revision)

https://committee.iso.org/sites/tc211/home/projects/projects---complete-list/iso-6709.html
Standards Formulation – Process (BIS)

- Proposal – Indigenous or already existing international standard – by Committee or any individual/organization
- Approval of subject by Committee
- Preliminary Draft – circulated to Committee members for comments
- Comments discussed & resolved in Committee meeting
- Wide Circulation draft – to all possible stakeholders
- Comments resolution and finalization
- Publication of IS
CURRENT PROJECTS IN LITD 22

a) Data Content Standard for Geospatial Information – Soils, Geology and Forestry
b) Cadastral Data Content standard for Geospatial Information
c) Revision of IS 16439 ‘Metadata Standard for Geospatial Information
d) Standards on LIDAR
e) NAVIC RECEIVERS
New Initiatives

- Creation of Standards National Action Plan (SNAP) – 2022-27
- Making Standards freely available
- Creation of Standardization Cells
- Manak Manthan
- Standards Clubs
- MoUs with IITs and NITs
- Funding for Research Projects
- Recognition of Contributions of Technical Committees and its Members
- QCOs: https://www.bis.gov.in/product-certification/products-under-compulsory-certification/
Thank you
Generic NavIC Receiver Performance Standard

6th Dec 2023
Akhileshwar Reddy, Programme Manager
Satellite Navigation Programme Office, ISRO HQ
Introduction - NavIC

- NavIC stands for ‘Navigation with Indian Constellation’
- Independent regional navigation system
- Developed indigenously by Indian Space Research Organization
- Provides two PNT services,
  - Standard Positioning Service (SPS) – civilian use
  - Restricted Service (RS) – military use
- Plans for expansion

Coverage:
India and 1500 km beyond Indian boundary
Introduction – NavIC Rx standards

• An increasing number of GNSS/NavIC enabled equipment are being used in India across different sectors

• Some of the application sectors have relevant standards for the GNSS/NavIC equipment used

• The GNSS/NavIC related standards already published or under development are mentioned in the following slides

• But, there is no performance standard to verify if an equipment supports NavIC or is designed to use NavIC signals
## ISO Standards

### Standards relevant to NavIC under ISO/TC20/SC14/WG8

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>13657</td>
<td>Space Systems – Space-based services – Positioning information exchange service</td>
</tr>
<tr>
<td>16215</td>
<td>Space Systems – Space-based positioning, navigation and timing (PNT) services – Part 1: Architectural basis</td>
</tr>
<tr>
<td>18197</td>
<td>Space Systems – Space-based services requirements for centimeter class positioning</td>
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<tr>
<td>22591</td>
<td>Space Systems – Space-based services for a high accuracy positioning system with safety requirements</td>
</tr>
<tr>
<td>24245</td>
<td>Space Systems – Global Navigation Satellite System (GNSS) receiver class codes</td>
</tr>
<tr>
<td>24246</td>
<td>Space Systems – Requirements for Global Navigation Satellite System (GNSS) positioning augmentation centers</td>
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</tbody>
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### Sector Specific Standards

#### Sector specific standards relevant to NavIC

<table>
<thead>
<tr>
<th>Sector</th>
<th>Transportation</th>
<th>IS 16833 : 2018 amendment-2 (through BIS / ARAI)</th>
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<tbody>
<tr>
<td>Road Transportation</td>
<td>IS 16833 : 2018 amendment-2 (through BIS / ARAI)</td>
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<tr>
<td>Maritime Navigation Equipment</td>
<td>IEC 61108-6 (through IEC TC – 80 / BIS TED 19)</td>
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<tr>
<td>Agricultural Drones</td>
<td>IS 17799:2022 (through BIS TED 32)</td>
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<tr>
<td>Communication</td>
<td>Telecom</td>
<td>3GPP Rel. 16 for Assisted NavIC support in LTE (through 3GPP / TSDSI)</td>
</tr>
<tr>
<td>High Accuracy Applications</td>
<td>Differential GNSS</td>
<td>RTCM 10403.3 DGNSS service version 3 onwards</td>
</tr>
<tr>
<td>Data Exchange</td>
<td>GNSS receiver interface</td>
<td>ISO 19116</td>
</tr>
<tr>
<td></td>
<td>GNSS output data format</td>
<td>NMEA 0183, Amendment v4.10 onwards</td>
</tr>
</tbody>
</table>
Other Standardization Activities

• Under the umbrella of ICG the performance standards and IGMA Task Force is working on standardizing various GNSS specific topics
  • Calculation methodology for clock and orbits
  • PDOP analysis
  • User range error (URE) estimation
  • Logged data file specifications
  • IGMA monitoring station specifications, etc.

ICG (International Committee on GNSS)
IGMA (International GNSS Monitoring and Assessment)
Existing Standards for Generic GNSS Rx

- Currently the only existing standard for generic GNSS receivers is ETSI EN 303 413 v1.2.0
  - This standard supports only BDS, GALILEO, GLONASS and GPS
  - There is no existing standard which supports regional navigation satellite systems like NavIC and QZSS
  - Moreover this standard only covers the frequency range of 1164 MHz to 1300 MHz (L5, L2) and from 1559 MHz to 1610 MHz (L1)
  - There is no provision for S-band GNSS receivers
Generic NavIC Rx Performance Standard

- To support the evolving applications in India we felt the need for a generic NavIC Rx standard for the following reasons:
  - To provide minimum denominator performance guideline for industry working in these sectors
  - To simplify the efforts required by sector-specific industries and certifying agencies to realize their standardization solutions
  - To accelerate the adoption of indigenous NavIC in these sectors
Experts’ Panel - 5 : NavIC Receiver

- LITD-22 committee of BIS, in its 9th meeting on 1st March 2023, recommended development of an Indian standard on NavIC receivers

- As per the recommendations, Experts’ Panel – 5 was constituted led by Dr. Manish Saxena, Director, Satellite Navigation Programme Office, ISRO for drafting this standard with members from Academia, Industry and Government organizations.

- We are currently working on generating the panel draft following which the draft would be publicly circulated to get comments/recommendations from Industry and Academia.

- Once the Indian standard is ready, we plan to propose a work item to evolve the same into an International standard under ISO/TC 211
Thank You

For queries please contact me at: akhileshwar@isro.gov.in