ICG-14 Action update on Recommendation #20

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Introduction to NavIC System Time

- Generated at IRNSS Network Timing (IRNWT-1/2) established at ISRO Navigation Centre (INC-1/2)

- Reference time for the entire NavIC network

- Traceable to UTC(NPLI) through GNSS CV, NavIC CV and TWSTFT

- Ensemble of multiple atomic clocks and is steered to a desired reference

- Supports the Orbit Determination and Time Synchronization (OD&TS) for the NavIC satellites
Performance of NavIC System Time

Offset between NavIC System time and UTC(NPLI) over a year

Mean: -2.56 ns; Standard Deviation: 6.90 ns
Proposal by ISRO during ICG-14

• NavIC to be included in the BIPM report which publishes the relationship between UTC and TAI with predictions of UTC(k) disseminated by GNSS and their system times

• Currently, BIPM publishes this data for GPS and GLONASS.
NavIC Broadcast for inter-GNSS interoperability

- Message Type 9 and 26 of NavIC broadcast message
  - contains offset of NavIC system time w.r.t UTC, UTC(NPLI) and GNSS systems.

<table>
<thead>
<tr>
<th>GNSS ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>GPS</td>
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<tr>
<td>1</td>
<td>GALILEO</td>
</tr>
<tr>
<td>2</td>
<td>GLONASS</td>
</tr>
<tr>
<td>7</td>
<td>UTC(NPLI)</td>
</tr>
<tr>
<td>3-6</td>
<td>Reserved</td>
</tr>
</tbody>
</table>
• **Interaction with BIPM:**
  - ISRO formally made a request to BIPM (Point of contact: Dr Patrizia Tavella)
  - Included as an *agenda in ICG-15 Working Group D*

• **Proposal for the deployment of NavIC Time transfer receiver at National Metrological Institutes:**
  - ISRO is making formal proposals to *foreign (non-Indian) NMI*s to deploy and operationalize NavIC receivers
Thank You