48th CGSIC Meeting - Timing Subcommittee

Savannah, Georgia, 16 September 2008

Chair: Włodzimierz Lewandowski, BIPM,
Co-Chair: Victor Zhang, NIST

14:00 Introduction – Włodzimierz Lewandowski, BIPM
14:20 Report from NIST – Victor Zhang, NIST
14:40 USNO Time Service – Demetrios Matsakis, USNO
15:00 Timing operations – Wendy Kelley, USNO
15:10 Progress on time transfer calibration – Ed Powers, USNO
15:20 Break
15:40 Update on the ITU-R WP7A work on the Future of UTC
   – Tom Bartholomew (invited talk)
16:00 Time and Navigation Exhibition at the Smithsonian: An Update
   – Andrew Johnston, National Museum of American History
16:20 Discussion
17:20 Session End
AREAS BEING SERVED

- International Atomic Time (TAI) and UTC
- International Timing Centers
- Global Navigation Satellite Systems
- Telecommunications Industries
- NASA/JPL Deep Space Network
- NIST Global Time Service
- Power Grids and other Industries
- As Research and Comparison Tool
- Other
Outline of presentation

• Change in the definition of international time scales
  • UTC
  • TAI
  • Leap second

• Relation between satellite time scales
  • GPS time
  • Glonass time
  • Galileo system time
[TAI - Time scale (i)]

The graph shows the time difference between various time scales from 1970 to 2020. The time scales compared include UTC, GLONASS time, GPS time, TAI, and GALILEO time. The graph indicates the cumulative difference in time between these scales over the years.
ICG Draft Recommendation

International Committee on Global Navigation Satellite Systems (ICG)

considering

- the international value of having many GNSS operational with a composite contribution of several tens of satellites,
- the desirability of using all systems interchangeably,
- the use by GPS of references very close to UTC and ITRF,
- the GLONASS efforts to approach UTC and ITRF,
- the Galileo design referring to UTC and ITRF,
- that other important satellite navigation systems are now being designed and developed*),

recommends

- that the reference times (modulo 1 s) of satellite navigation systems be synchronized as closely as possible to UTC,
- that the reference frames for these systems be in conformity with the ITRF,
- that these systems broadcast, in addition to their own System Time (ST):
  1. the time difference between ST and a real-time realization of UTC,
  2. a prediction of the time differences between ST and UTC.

*) Compass, IRNSS, QZSS, various SBAS, …
ITU meeting on redefinition of UTC
Geneva, 6 -10 October 2008
To avoid proliferation of time scales ITU plans to stop application of leap seconds to UTC

- October 2008: ITU Working Party 7A will submit to ITU Study Group 7 project recommendation on stopping leap second
- During 2009 Study Group 7 will conduct a vote through mail among member states
- 2011: if 70% member states agree World Radio Conference will approve recommendation
- 2013: application of leap second will stop and UTC will become a continuous time scale
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