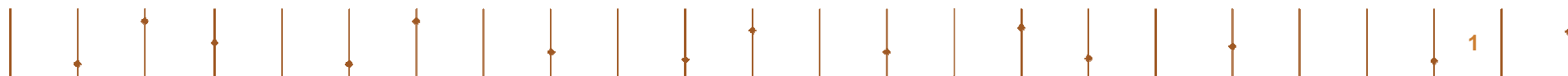


Progress on works related to the proposed redefinition of UTC

WG-D Task Group on timing references
Contribution from BIPM

E.F. Arias, W. Lewandowski

Eighth Meeting of the International Committee on
Global Navigation Satellite Systems (ICG)
Dubai, United Arab Emirates
9-14 November 2013



ITU/BIPM Workshop on the future of the international time scale

(19-20 September 2013)

- ◆ **16 invited speakers**
 - ◆ ITU-R, ITU-T, BIPM, IERS, IAU, IUGG, ISO
 - ◆ GPS, GLONASS, Galileo, BeiDou
 - ◆ NIST, NPL, Time Stamping, Network Time, Telecommunications
- ◆ **60 participants**
 - ◆ ITU administration members
 - ◆ National Metrology Institutes
 - ◆ International Organizations
- ◆ **Presentations available on-line**
- ◆ **ITU News Magazine special issue**
(www.itu.int/ITU-R/go/itu-bipm-workshop-13)



ITU/BIPM Workshop on the future of the international time scale

(Geneva, 19-20 September 2013)

The workshop provided unique opportunity to get all available information on time scales and dissemination systems and different views on the future of UTC.

Addressed for the managerial and technical staff of State radiocommunication authorities involved in preparation for WRC-15 helping them to develop national positions; telecommunication companies, internet providers, space agencies, aviation, maritime and meteorological organizations, universities in providing them with an understanding of regulatory, technical and practical aspects of keeping and disseminating standard frequency and time signals.



Issues addressed by speakers

- ◆ **Non adequacy of the leap second insertion in**
 - ◆ **Telecommunications (ITU-T)**
 - ◆ **Precise systems synchronization (as GNSS)**
 - ◆ **Time stamping (Japan Time Stamping Authority)**
 - ◆ **Network Time Protocols (NIST time server)**

- ◆ **International Organizations**
 - ◆ **IAU –small sector of astronomers are users of time scales, no clear consensus. Applications as pulsar timing require continuous time scales**
 - ◆ **IUGG, BIPM, IERS – favorable to the suppression of leap seconds**
 - ◆ **ISO – terminology constraints (keeping the name UTC if modified)**

- ◆ **Input from one administration (UK)**
 - ◆ **Negative to change, favoring the dissemination of two time scales**

ITU/BIPM Workshop on the future of the international time scale

Input from GNSS

representatives

- ◆ GPS, Galileo, BeiDou acknowledge the benefits of a continuous UTC for the sake of security in operations, and support a re-definition of UTC without leap seconds;
- ◆ GLONASS prefers to maintain the present UTC system based on difficulties in upgrading some specific equipment;
- ◆ Considerations on maintaining a looser link with UTC have been made based on civil time keeping convenience;
- ◆ Proposals for disseminating two legal time scales (UTC and a continuous one)

Work at the ITU on the future of UTC

Preparing documentation for the World Radiocommunication Conference 2015

Possible solutions and alternatives as proposed, consequences:

◆ Stopping the insertion of leap-second adjustments in UTC:

- ◆ adequate for precise time synchronization;
- ◆ Avoids risky and unnecessary complications;
- ◆ No consequences on users of UT1 if
- ◆ broad dissemination of the UT1-UTC values predicted by the IERS. The role of GNSS in this will be fundamental;
- ◆ Enough time will be given before application for allowing software/hardware modifications.

◆ Change the procedure of synchronization of UTC to UT1 from 1 leap-second to 1 leap-hour:

- ◆ a leap-hour event could happen in many centuries;
- ◆ this is a « political compromise » for satisfying requests of fixing a maximum offset between UT1 and UTC;

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Possible solutions and alternatives as proposed, consequences (more):

- ◆ **Simultaneous dissemination of UTC in its present definition, and of another continuous atomic time scale; both should be legal:**
 - ◆ Arranges all users and applications (apparently only);
 - ◆ Creates confusion
 - ◆ Difficult technical implementation
 - ◆ Legal implications, difficult coordination between nations with legal times defined differently

The document will be finished at ITU in March 2014

Decision will be made at WRC-15