Thoughts on GNSS system times and broadcast time scales

WG-D Task Group on timing references
Contribution from BIPM

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

- For avoiding system disruptions
  - Availability of services in peril
  - Safety of life issue (even if the procedures are well built and most of times successfully implemented)
  - Potential risk of system outages
  - No adapted for system synchronization (but this is the use!)
  - Simplify operations

- Steering to a reference time scale (a realization of UTC)
  - For improving the accuracy of GNSS times
  - Steering to UTC(k) modulo 1 s is a good procedure
Why continuous GNSS system times?

- **When/where a 1-s step can create problems?**
  - Time tagging on UTC and GNSS time in different parts of a GNSS system.
    Offset of a few seconds (BeiDou), of tens of seconds (GPS, Galileo)

- **What time scale should GNSS broadcast?**
  - Certainly NOT a GNSS internal system time. It should be limited to internal system operations.
  - YES a prediction of UTC(k), but taking care to make a GOOD prediction.