RECOMMENDATION 3 (CI-2009): Alignment of geodetic references and synchronization of time references to international standards

The International Committee for Weights and Measures (CIPM),

considering that

- the International Terrestrial Reference System (ITRS) has been recommended by the International Astronomical Union (IAU) and the International Union of Geodesy and Geophysics (IUGG) for applications in space and Earth sciences;
- primary access to the ITRS is achieved through the International Terrestrial Reference Frame (ITRF), and access with an uncertainty ranging between 3 cm and 40 cm is also possible through the global geodetic systems WGS84, PZ-90, the Galileo Terrestrial Reference Frame (GTRF), the China Geodetic System 2000 (CGS’2000), and through regional densifications;
- the time scale endorsed by the 15th General Conference of Weights and Measures (1975) for world-wide time coordination and dissemination is Coordinated Universal Time (UTC);
- the BIPM provides coordination for the maintenance and dissemination of UTC;
- GPS time is steered to the real-time realization of UTC maintained at the United States Naval Observatory (USNO), UTC(USNO) (modulo 1 s), GLONASS time is steered to the real-time realization of UTC maintained at the Institute for Physical-Technical and Radiotechnical Measurements (VNIIFTRI), UTC(SU), and Galileo time will be steered to an ensemble of European realizations of UTC, keeping the seconds of GPS time;
- the BIPM participates in the International Committee on GNSS (ICG);

and aware that

- new global navigation satellite systems (GNSS) are being designed and developed;
- interoperability of the various GNSS would be facilitated by the adoption of international time and geodetic references;
- common internationally recognized time and geodetic references are necessary for civil and scientific activities world-wide;
recognizes that

- the ICG is a unique structure enabling GNSS Service Providers to align their time and geodetic and references to UTC and the ITRS for the operation of their systems;

recommends that

- the geodetic references used by the GNSS be aligned as closely as possible to the ITRS;
- the internal System Times (ST) of the GNSS be synchronized as closely as possible to UTC (modulo 1 s);
- the GNSS broadcast, in addition to their own ST:
  - the time difference between the ST and a real-time realization of UTC,
  - the time differences between various STs;

and requests that

- the BIPM coordinate the necessary actions within the ICG.