

## REPORT ON THE GROUP DISCUSSION ON THE FUTURE OF UTC

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In a brief discussion following the presentations, some participants felt that the official report of the Torino Colloquium on the definition of UTC had not represented accurately the discussion that they recalled. Other discussion brought out the point that the principal advantage of retaining the current definition of UTC is the potential cost of revising existing software that uses UTC as a substitute for UT1. In these applications the requirements for precision are satisfied by the current 0.9-second tolerance, and the software has been designed accordingly. Should the definition of UTC be modified in any way that would permit this tolerance to be exceeded, substantial costs might be required to make non-trivial changes in existing software.

However, it was pointed out that, although UT1 is expressed as a time, it is not used practically as a time scale. Rather, it is used as an angle that is related to the rotation angle of the Earth in the celestial reference frame. Knowledge of UT1 is essential in relating celestial and terrestrial reference systems, and the IERS provides daily values and predictions for up to a year in the future. It is conceivable that the systems served by legacy software based on the current UTC definition could benefit from using more realistic values for UT1 as opposed to the UTC approximation.

Another reason mentioned for retaining the current definition was that referring UTC to UT1 does provide a means to keep UTC in synchronization with the position of the Sun in the sky, which is desirable to meet society traditions.

Some participants discussed the need to modify the definition of UTC to meet growing requirements to accommodate advances in telecommunications, navigation and related fields with a single, internationally recognized uniform time scale. The issue is that the operational model to accommodate the discontinuities in the current definition is to generate internal system time scales. This situation could lead to multiple *de facto* time scales, and these “pseudo time scales” could lead to confusion and potentially serious consequences. There are also concerns regarding the current timing sequence followed during the implementation of a leap second. The convention is to number the leap second with the label “60” in the minute in which it has been inserted. Unfortunately many timing system do not permit a second to be labeled “60.” In the past, this may have resulted in 2 seconds labeled 59 or even a second without a label. A conventional means to resolve this problem has not been adopted.

The discussion closed without consensus regarding recommendations for the future definition of UTC.

