

Colloquium Report Information Paper

The ITU-R Special Rapporteur Group (SRG) studying on the Future of the UTC Time Scale held a colloquium on the issue in May 2003. The report from this colloquium is attached at Annex A. A brief summary of the results and potential direction for study is described in the executive summary. This information paper is being provided to provide these results and indicate information on the direction of further work.

Overall Study Reference

The colloquium and preceding activities of the SRG were to answer the elements of ITU-R Question TF.236/7 on the Future of the UTC Time Scale, a principal objective was to re-establish the primary users of the current UTC system, as defined in Recommendation ITU-R TF.460-5, and determine if the intended user community was being served as originally intended in the formation of this system. Those requirements combined with the determination of any new needs and requirements could be applied to evaluating the adequacy of the current broadcast time and frequency service to provide an internationally coordinated timescale. The discontinuities introduced by the addition or subtraction of leap seconds having been raised as the largest issue in the current application of UTC for new telecommunication and navigation system users. Not only the discontinuity of an integer second being applied is at issue but under the current definition the possibility of the occurrence increasing beyond the preferred times of application to the allowed monthly application. In conjunction with establishing a measure of the adequacy of the current definition provided by broadcast services, remedial methods were investigated for possible modification of the definition of UTC.

Interpretation of the Results to Date

The scientific evidence and research into the projected future relationship between International Atomic Time (TAI) and UT1, Mean Solar Time indicates the two scales will diverge at an increasing rate of change. Material presented at the colloquium led to the conclusion that at some future point the current UTC definition will be untenable. The question of when this condition is reached varied between the participants.

The needs and requirements for UTC during the discussion and presentations can be categorized into three principal areas, "Civil Time", "Mean Solar Time" and "Precise Time". The associated accuracy of the time provided increases accordingly in the three areas. UTC currently serves all three with the original aim of maintaining a moderately accurate approximation of "Mean Solar Time". The original needs of celestial navigation and astronomical users for the widespread dissemination of UT1 were not re-established. Evidence of the use of precise time in the operation of current telecommunication and navigation systems was presented. Widespread use of these systems is leading to the creation of system unique time scales. These time scales pose the threat of multiple incompatible time scales or quasi-time scales being used and creating potentially significant operational problems between those systems.

Conclusions

The eventual divergence and resulting effects were established and generally accepted. The question of what change or changes to make led to considerable discussion. The result of reviewing

the scientific evidence, shift in the user community and discussion of alternatives led to the points contained in the executive summary and sections 4 and 5 in the body of the report. These points can be interpreted as outlining the characteristics of the eventual time scale and a framework for implementation. Sudden or dramatic change to UTC was generally agreed as undesirable, consequently an evolutionary transition was agreed as necessary and a proposed completion date suggested. A plan for the eventual transition need to be established.