DISCUSSION CONCLUDING AAS 11-675

Ken Seidelmann noted that arguments favoring the abolition of leap seconds are often posed as somehow benefiting the GPS program, which Steve Malys' presentation seemed to deny. Dennis McCarthy countered that he has heard no such arguments. John Seago noted that Seidelmann's perception may be accurate, yet based on the fact that some GPS receiver technology may benefit from changes to UTC, rather than the GPS program itself. McCarthy agreed that this is possible because GPS time receivers have a spotty record in their handling of leap seconds. His first-hand experience with such receivers suggests that some manufacturers neglect the details of the GPS interface control document (ICD). Malys agreed that many manufacturers fail to honor the GPS ICD specifications.

Rob Seaman reported that he attended a GPS birds-of-a-feather (BOF) meeting at JavaOne many years ago, and the discussions by the attendees—many of whom write embedded applications for GPS receivers—lacked a depth of understanding compared to the discussions within the colloquium. McCarthy guessed that perhaps 10% to 20% of GPS timing receivers do not handle leap seconds well; the proper treatment of leap seconds may now be overlooked due their declining frequency in recent years. Malys clarified that these issues do not affect positional accuracy, and it was agreed that the current discussion was limited to GPS time receivers. Seidelmann noted that one receiver manufacturer failed to account for the leap years properly.

Seaman noted that the issue of leap seconds is a two-edged sword. While developers like Poul Henning-Kamp have testified that there are computer science issues surrounding the introduction of leaps seconds, Seaman's own experience "as a computer-science type of guy" suggested that the abolition of leap seconds will certainly make his tasks more difficult rather than less difficult. Either option—keeping leap seconds or abolishing them—would have consequences. The previous three presentations affirmed that the issues remain mostly unstudied up to now, and decisions should not be made until the issues are studied carefully and the trade-offs are thoroughly understood.

Reed opined that a changeover might be hard for legacy software, but for future software it should be "definitely easier". Seaman countered by way of example. He is on the Large Synoptic Survey Telescope (LSST) data management list; he sees many LSST messages and has even attended LSST meetings focused on timekeeping, and it seemed that timekeeping issues were not "on their radar." One should expect legacy software to be recycled without guidance on these issues, and the current process as a whole has not provided guidance. LSST is expected to deploy about the time that leap second would go away, but that project hasn't been giving the issue any attention.

Based on Malys' presentation, John Seago was impressed that it might not only be expensive to retire intercalary adjustments, but it seemed almost impossible to reintroduce them once they were taken away. Any sort of an alternative proposal involving a less-frequent adjustment, such as something like a "leap minute", reduces the visibility of the issue with system designers and does not motivate designers to accommodate them. Seago then referred back to McCarthy's earlier point that the current rarity of leap seconds already causes some people to neglect them now;

loosening the current degree of coupling would foster a situation whereby the re-alignment of the background time scale for civil timekeeping to Earth rotation becomes impractical.

David Simpson commented that there seems to be a prevailing attitude that it will take money to investigate the impact of making a change, yet no one wants to make that investment until a decision has been made. However, once the decision has been made, it then becomes too late for cost estimates to affect the decision.