

Guest Editorial

>> Gavin Schrock, LS

CGSIC Highlights

To state simply that the pool of GPS users has grown rapidly would be a gross understatement; more like a flood of biblical proportions. This flood is proving to be an epic challenge for the constellation providers to manage with regards to addressing needs and concerns of these users. The problem is that the pool is increasing in depth in certain areas but immeasurably shallow in the majority. The deep end of the pool is made up of the longtime user segments of GPS—marine navigation, timing, high precision applications like surveying, science, and transportation—providing pointed, learned, and specific feedback. The vast majority of users are the consumer market, and those that may not even realize that the technology they are using depends on GPS (like timing for computer and cellular networks). The 49th meeting of the Civil Global Positioning System Service Interface Committee (CGSIC), held September 21-22 in Savannah, Georgia, highlighted the varied depths of this pool and the ever growing demands to push an otherwise outstanding system to service levels far beyond its designed performance levels.

The charter of the CGSIC is to identify the needs and concerns of the civil users of GPS and report back to the U.S. authorities for consideration in policy, operations, and service matters. To this end CGSIC has held 49 meetings, two per year, as a forum for end-users and developers, open to all. This model has worked well, with sessions for states and localities, international users and other constellation providers, timing specialists, official updates from American GPS authorities, and, in recent years, a CORS forum hosted by the National Geodetic Survey (NGS).

Each CGSIC meeting begins with an overview of the national positioning, navigation, and timing (PNT) program, given this year by Lt Col. Scott Boushell, of the U.S. National Coordination Office for Space-Based PNT—quite the mouthful, but this is the official top-level government coordinating body when it comes to GPS. (More can be learned about this office by visiting www.pnt.gov, and their companion website with some handy general links about GPS at www.gps.gov.) Lt Col. Boushell shared the view of his office that “like the Internet, GPS has become a critical component of global information infrastructure,” and that the national policy is formed in part from such views.

The GPS Program Update that followed emphasized that the system far outperforms designed service levels, now serving far more uses, users, and user segment than anyone ever imagined. Like other user segments, surveyors are hooked and hungry for more—more users mean more development, more uses, and thirst for higher precisions and availabilities. The update was given by John Langer, Tech Director of the GPS User Equipment Group on behalf of the U.S. Air Force GPS Wing. Mr. Langer noted that the civil performance levels have been consistently met since 1993 and the nominal constellation is 24 satellites (though currently at 30 live and one “test” satellite, but later he clarified what he meant by “test” satellite). No one present suggested that the GPS constellation was not an amazing system or in danger of failing to meet currently specified performance levels, but in the Q&A that followed, the running theme was that perhaps it is time to rethink the current minimum performance levels and push for a nominal constellation of 30+ satellites. Mr. Langer also gave an example of where the military is applying lessons learned from the consumer market, sheepishly admitting “They do a better job than we do,”

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with regards to hand-held field units. "By the time we spec one out and have it constructed, the unit is too heavy and obsolete," he added.

That brings us to the subject of the errant satellite SVN49, now characterized as a "test" satellite, or, as Mr. Langer described the "test" moniker: a way of "making lemonade out of lemons". While the unanticipated consequences of adding the L5 demonstration payload to SVN49 were quite well known amongst the participants, a great summary was provided by Tom Stansell, a familiar consultant to a great many GNSS related organizations. The seven-year window on a filing with the International Telecommunications Union (ITU) for the intent of deploying L5 was rapidly coming to a close, so the solution was to deploy a demonstration package on the SVN49 platform. Signals passing through a common bus trickled back through to a

the recent ICG proceedings. In short, there is steady but subtle progress in discussions between the current and proposed constellation providers in matters of interoperability, but some, like the European Galileo group, get stuck on terms like "performance commitments", though as Alice pointed out this may be due to language challenges, or not...

Concerns of the end-users took a much more prominent role this year. Repeated questions to panelists focused on end-user notifications like that warning of a possible high HDOP event September 8th-11th, users noted that while deeper examination of the notices and links provided by such parties as the Coast Guard NAVCEN revealed the very limited nature of the event, that such notices appear rather cryptic to the uninitiated. The USAF GPS Operations Center provides standard format notices directly only to those entities involved

in our concerns. Perhaps it would be a great idea if the respective government affairs committees of our professional organizations and associations had a more direct role in the PNT coordination efforts, such as a permanent delegation to the CGSIC or a seat on the PNT coordinating committees.

For the fifth year running the NGS has hosted a half-day CORS forum at the CGSIC, and for the past three years the focus has been on Real-Time Networks (RTN). Each year the CORS forum has been organized by Dr. Richard Snay of the NGS, who, we are sad to hear, will retire from the NGS next year. For elements of the national CORS, OPUS, and many other successful NGS initiatives, we all owe a great debt of gratitude to Dr. Snay. On a fitting note, this forum he organized was tremendously productive. The NGS RTN-Team provided a preview of the soon-to-be-published Guidelines for RTN Operations and Use. Two years of committee participation from the public, private, and manufacturing sectors has produced a draft document divided into section for site construction, planning and design, operations, field usage, and the section by Dr. Snay on how to constrain RTN stations to the National Spatial Reference Framework. The committee working under the guidance of NGS's Bill Henning has handed off the draft document to NGS communication professionals for "assembly" into the final document. Expect the publication by year's end.

While the venue was a bit smaller than in previous years, this CGSIC included selected presentations on advanced uses for GNSS. Eric Gakstetter, GNSS consultant, presented an overview of the subject of RTN contrasting conventional RTK and other real-time solutions, and James Stowell, GNSS consultant, presented "structural health monitoring" like that being used for dams, bridges, and other structures.

On a related note, I recently attended the 2nd Annual conference on the Long Term Behavior of Dams held in Graz, Austria October 12th-13th. It was noted by many who attended that while the nature of monitoring the health of structures such as dams relies greatly on modeling, the advances in measurement technologies such as GNSS and fiber optic strain cables are providing data needed to support or even challenge such modeled assumptions. So it looks like the scientists really need us surveyors after all. 

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primary system adding a bias to L2. The unit will remain a "test" unit until this matter can be resolved. To that end a full forum on SVN49 was to be held at the Institute of Navigation (ION) also held in Savannah proceedings a few days later. Input from the user and manufacturer segments is being actively solicited with regards to possible solutions. I heard many varied suggestions ranging from the rather impractical "recover and repair" to "design around the known bias", the latter suggested by Greg Turetsky of Sirf (a major manufacturer of consumer grade GPS chips and components).

Some of the international flavor of these CGSIC proceedings seemed a bit diminished in comparison to past years. One major contributing factor is that the International Committee on GNSS (ICG) is stealing much of the thunder. The ICG held its 4th meeting in St. Petersburg, Russia the week before the CGSIC. For more on the ICG see "Guess Who's Coming to Dinner?" April/May 2009 issue of this magazine. Alice Wong of the Executive Committee for National PNT gave a summary of

in safety-of-life uses—like the FAA and Coast Guard that resend notices in their own formats (such as notices to navigation users, or NANU's from the NAVCEN, and notices to airmen, or NOTAM's from the FAA). What many feel is missing are notices not in the legacy navigation formats, but rather "translated" for various segments of users ranging from the dual-frequency high-precision folks like surveyors, to the single frequency consumer-level users. The recent high HDOP scare started a rumor mill of anecdotal reports of problems that would have otherwise not been attributed to the actual event. The calls for a broader range of notifications came also from overseas users; members of the Japanese delegation called for free-text notices to be easily readable in-the-field through mobile devices. This type of feedback is precisely what the CGSIC is all about. Even though GPS Operations and the PNT Coordination Office have been proactive in many areas, they will likely not anticipate fully the needs of the high precision segment (read "surveyors") unless we are more vocal