WAAS Technical Report
William J. Hughes Technical Center
Pomona, New Jersey
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Author(s): Choon Ooi

DR#43: Switchover followed by Signal-in-Space (SIS) outage in CRW.
GPS Week/Day: Week 1403 Day 3 (11/29/2006)

Discussion:

On Week 1403 Day 3 CRW had a successful GUS switchover from Littleton to Napa. According to real-time processing the switchover started at GPS time 302782 (12:06:23 GMT) and ended at 302796 (12:06:37 GMT) follow by 7 type 0 messages. The switchover lasted 14 seconds. About 355 seconds later CRW experienced a signal-in-space (SIS) outage that lasted 11309 seconds starting from GPS time 303151 (12:12:32 GMT) to 314460 (15:21:01 GMT). Table 1 is a brief timeline of events for both Littleton and Napa.

Table 1

GPS Time	GUS	Event
302786	Littleton	From Primary to Backup
302791	Napa	From Backup to Primary
304231	Napa	From Primary to Faulted
314434	Littleton	From Verification to Backup
314452	Littleton	From Backup to Primary
320898	Napa	From Verification to Backup

According to O&M output, Littleton was the primary GUS before the switchover. During the switchover, Littleton switched from primary to backup at GPS time 302786 (12:06:27 GMT). 5 seconds later at GPS time 302791 (12:06:32 GMT) Napa switched from backup to become the primary GUS. But just 1440 seconds into being the primary at GPS time 304231 (12:30:32 GMT), Napa went into faulted mode with Littleton still in unknown mode. With both GUSes unavailable, it caused CRW to lost signal until Littleton was up again as the primary GUS at GPS time 314452 (15:04:13 GMT), where everything is back to normal.

Although Napa only became faulted at GPS time 304231 (12:30:32 GMT), the correction data stream outage had started much earlier than that at GPS time 303151 (12:12:32 GMT), which is also about the time where all the receivers lost track of CRW. CRW was tracked again around the time when Littleton was back as primary GUS. Littleton also

experienced communication outage on both rings during the period when it was not the primary GUS.

Since AOR and POR GEOs continued to operate, the availability outage occurred in Northeast CONUS.

Conclusion

After a successful switchover from Littleton to Napa, Napa went into faulted mode 24 minutes after being the primary GUS. As a result, no GUS signal is available for CRW for significant period of time, which caused SIS outage.