WAAS Technical Report
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DR# 28: *GPS Clock Antenna Problem Caused ZDC C&V to Fault Repeatedly While ZLA was Selected C&V Source*

GPS Week/Day: *Week 1364 Day 5 (3/3/2006)*
Week 1365 Days 0-2 (3/5-7/2006)

Discussion:
Beginning on week 1364 day 5 (3/3/2006), a problem with the GPS clock antenna at ZDC C&V caused both ZDC C&V corrections processors to fault. ZLA was the selected source for all four GUS's at the time. ZDC C&V faulted several times over the next 5 hours before returning to Normal mode. A similar sequence of events transpired on Week 1365, days 0 to 2, when ZDC C&V faulted several times over the course of three days, while ZLA C&V was the selected source. There was no SIS interruption as a result of any of the ZDC faults. The faults were caused by a GPS clock antenna problem, and by the troubleshooting process. Eventually the GPS antenna and clock were replaced, and the issue was resolved.

The first fault occurred on 1364 day 5, at GPS time of week 452725 (05:45:25 GMT). Nearly 3 minutes later, ZDC-CP2 went to Maintenance Mode for two seconds, then it Faulted again. Both corrections processors faulted again at 06:54:03 and 08:15:00 GMT. Nine minutes later they went to Verification mode, then to Normal mode for about two minutes, then back to Maintenance mode. About 80 minutes later, at 09:45:59 GMT, both processors Faulted again. They returned to Verification mode at 10:16:22, and back to Normal mode a half hour later. They remained in Normal mode through the end of the day, until 1365 day 0.

On week 1365 day 0 (3/5/2006), at GPS time of week 9897 (02:44:57 GMT), both ZDC C&V's went to Normal mode, but Faulted within two minutes. As part of the troubleshooting process, the WAAS Operator set ZDC C&V back to Maintenance mode at 06:08:08 GMT. ZDC C&V went back and forth between Faulted and Maintenance modes nine times that day. Additionally, on fourteen occasions, ZDC-CP2 transitioned to Maintenance mode before faulting again within two seconds. The toggling between Maintenance mode and faulting was due to the troubleshooting process.

On 1365 day 1 (3/6/2006), both corrections processors Faulted at 14:26:18 GMT, but went back to Maintenance mode five minutes later. They Faulted again at 18:22:17. ZDC-CP2 had eight more occasions where it went to Maintenance mode before faulting again within seconds.

On 1365 day 2 (3/7/2006), the ZDC-CP2 went to Maintenance mode, then a Fault occurred once more. Both corrections processors Faulted one more time at 19:42:18 GMT. Over an hour later,

at 20:46:52, they went to Verification mode, then to Normal mode after yet another hour (at 21:53:04 GMT).

Conclusion:

On GPS week 1364 day 5 and 1365 days 0 to 2, the ZDC C&V faulted repeatedly, while ZLA was the selected source for all four GUS's. Initially, the faults were caused by a GPS clock antenna problem. More faults resulted from the troubleshooting process, as components were replaced. The GPS clock was replaced in the course of troubleshooting, but the faults didn't cease until the antenna was replaced.

This was a temporary loss of redundancy. There were no effects on WAAS performance or the Signal in Space.