WAAS Technical Report
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DR#60: ZDC C&V Faulted, Followed By Geo Initialization.
GPS Week/Day: Week 1432 Day 4 (6/21/2007)

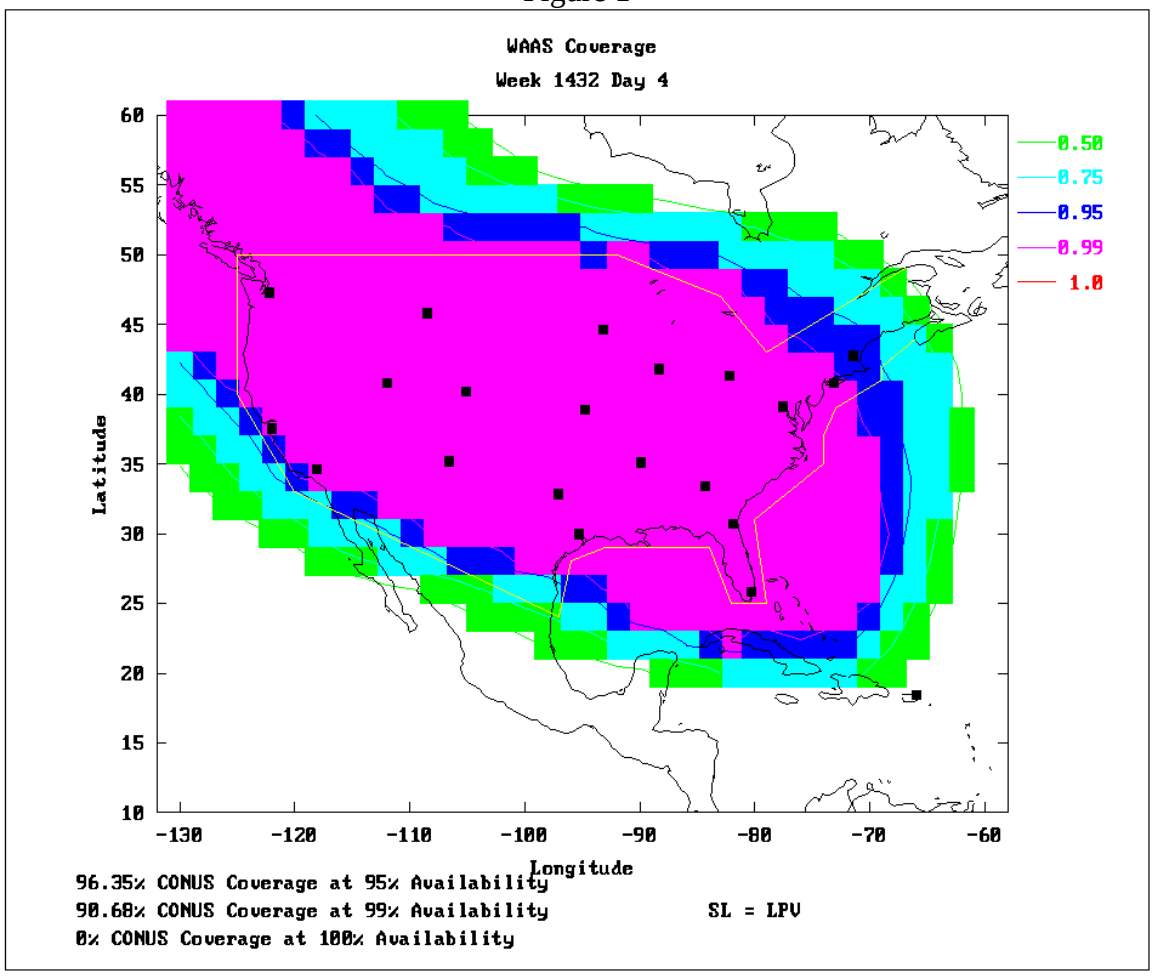
Discussion:
On Week 1432 Day 4, ZDC C&V faulted at GPS time 364783 (5:19:44 GMT). All the GUSs for AOR, POR and CRW switched C&V selected source to ZTL from ZDC 1 second before the C&V was faulted. One second after ZDC faulted (GPS time 264784 (5:19:45 GMT)) there was a one second gap in data from the three GEOs. At GPS time 264786 (5:19:47 GMT), all 3 GEO were initialized by 4 Type 0 messages. Table 1 shows the brief activity log for ZDC C&V, the three GEOs, and the GUSs. ZDC C&V was set to normal mode again at GPS time 367426 (6:03:47 GMT) for CP1 and 367427 (6:03:48 GMT) for CP2.

The GEO initialization caused all the WAAS sites to drop to SPS mode and later NPA mode for approximately 260 seconds before returning to PA mode again. The 100% LPV availability in CONUS and Alaska were also lost as a result of the initialization. Figure 1 shows the WAAS CONUS coverage availability for this day.

Table 1 – Event Summary

GPS time	GUS / C&V /GEO	Events
364782	GUS – BRE	Selected source switch from ZDC to ZTL
364782	GUS – STA-A	Selected source switch from ZDC to ZTL
364782	GUS - APC	Selected source switch from ZDC to ZTL
364783	C&V – ZDC – CP1	From Normal to Faulted
364783	C&V – ZDC – CP2	From Normal to Faulted
364783	GUS – STA-B	Selected source switch from ZDC to ZTL
364783	GUS – CLK	Selected source switch from ZDC to ZTL
364783	GUS – LTN	Selected source switch from ZDC to ZTL
364786	AOR	Start of 4 second alarm Type 0 initialization
364786	POR	Start of 4 second alarm Type 0 initialization
364786	CRW	Start of 4 second alarm Type 0 initialization
366321	C&V – ZDC – CP1	From Maintenance to Verification
366322	C&V – ZDC – CP2	From Maintenance to Verification
367426	C&V – ZDC – CP1	From Verification to Normal
367427	C&V – ZDC – CP2	From Verification to Normal

Figure 1



Investigation by Raytheon showed that the communication between the two correction processors to the two safety processors stopped. After ZDC C&V went faulted the two correction processors continued to operate. The suspected problem was the safety LAN at ZDC.

Conclusion

A C&V fault at ZDC caused a selected source switch in all GUSs and initialization in all three GEOs. The initialization resulted in the loss of WAAS availability across CONUS and Alaska. All three GEO also reported one common missing message after the C&V fault.