WAAS Technical Report
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DR# 48: Abnormal CRW Switchover and Extended SIS (Signal in Space) Outage
GPS Week/Day: Week 1412 Day 5 (2/2/07)

Discussion:

On GPS Week 1412 Day 5, an abnormal CRW GUS switchover occurred. Prior to the CRW SIS outage, LTN was the Primary GUS. The SIS outage began as LTN GUS changed to Backup mode, and APC GUS was changed to Primary mode two seconds later, which is typical in a GEO switchover. However, the APC GUS faulted immediately after it was set to Primary mode. Over the next 9½ minutes, the APC GUS transitioned to Maintenance, then Verification, then Backup modes. Nine seconds later, APC became the Primary CRW GUS, and SIS resumed four seconds later. No Type 0 messages were broadcast from the CRW GEO following the SIS outage, which lasted 580 seconds total.

Table 1 shows the order of events.

Table 1. Abnormal CRW GUS Switchover and Extended SIS Outage Order of Events

WAAS Time of Week	UTC	Event
460994 – 461573	08:03:00 – 08:12:39	CRW SIS outage
460994	08:03:00	LTN GUST changed to Backup mode
460996	08:03:02	APC GUST changed to Primary mode
460997	08:03:03	APC GUST mode changed to Faulted
461043	08:03:49	APC GUST mode changed to Maintenance
461068	08:04:14	LTN GUST mode changed to Maintenance
461279	08:07:45	APC GUST mode changed to Verification
461561	08:12:27	APC GUST mode changed to Backup
461570	08:12:36	APC GUST mode changed to Primary
461574	08:12:40	CRW SIS resumed

Table 2 confirms the time and length of the SIS outage, and offers some additional details about the GUS component status at the time. Also, according to Table 2, the switchover was initiated by the O&M Operator. Note that ZDC was the selected C&V source for all six GUS's for the entire day.

The reason APC faulted immediately was due to a lack of communications from the M&C in the RFU and the GUS processor (GP). The GP sent a message to the M&C but did not receive a return acknowledgement. The message was the L1 antenna load control switch.

Conclusions:

On GPS Week 1412 Day 5, an abnormal CRW GUS switchover occurred. SIS stopped, APC GUS was set to Primary mode, but it faulted immediately. After the APC GUS had come out of Verification mode, it was again set to be the Primary CRW GUS. CRW SIS then resumed, but no Type 0 messages were broadcast from the GEO.

Table 2. GUS Component Status (from Raytheon WAAS Performance Monitor).

WST	Date	Time (UTC)	Validity	Initiated by	GEO	Sel. Src C&V	Primary GUS (From/To)	L1/L5 Transponder Offset (Hz)	MT61 C&V Tx	MT61 C&V Rx(SIS)	Time w/o SIS (secs)	Primary GUS Re-Lock Time	PR/BK GUS Loop Lock N of M Test (last 10 secs)
854438594	02/02/2007	08:03:00	Abnormal	O&M_Operator	CRW	ZDC	LTN/APC	-23.1/-25.1	37	0	580	1921.5	10/10

Table 2 was taken from
http://www.waasperformance.raytheon.com/performance/PERFMON/curr/field/system_status/AGSVC_CRW_curr.html
on Februrary 7, 2007.