WAAS Technical Report
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DR#58: Communication Fault Caused Selected C&V Source Switch on CRW GUST's GPS Week/Day: Week 1426 Day 3 (May 9, 2007)

Discussion:

On GPS Week 1426 Day 3, there was a selected C&V source switch on CRW GUST's coincident with 2 messages with bad CRCs. This was immediately followed by one message, and then a GUS switchover during a 13 second gap. The order of events is shown in Table 1.

On this day at GPS time of week 330231, there was a source selection switch (from ZDC to ZTL) at the LTN GUS followed by a source selection switch (from ZDC to ZTL) at the APC GUS. The unsolicited GUS switchover was due to a communication fault. As a result of the switch, GUS LTN was set to backup mode, while APC was set to primary.

Table 1. C&V Faults and Resulting GEO Events

GPS Time of Week	Time (GMT)	Event
259200	00:00:00	AOR, POR, and CRW GUST's using ZDC as C&V Source
330230	19:43:36	CRW Message with bad CRC received
330231	19:43:37	CRW Message with bad CRC received
330231-2	19:43:37 to 19:43:38	ZDC C&V Faulted
330231	19:43:37	Primary GUS LTN changed to ZTL C&V source
330232	19:43:38	GUS APC changed to ZTL C&V source Type 4 message from CRW
330233	19:43:39	GUS LTN changed from Primary to Backup
330241	19:43:47	GUS APC set to Primary
330245-52	19:43:51 to 19:43:58	8 Type 0 messages broadcast after GUS Switchover
335553	21:12:19	GUS APC changed to ZDC C&V Source
335554	21:12:20	GUS LTN changed to ZDC C&V Source

Real-time data processing of the WAAS message stream is performed on a daily basis. Detailed output of WAAS message types from CRW GEO is shown in Table 2. A GUS switchover occurred from GPS time of week 330233-330244.

Table 2: Real-Time WAAS CRW GEO Messages

Time	Msg Type	GEO	IODP/Band#	IODF/Block #
330220	3	135	2	0
330221	28	135	2	
330222	2	135	2	2
330223	63	135		
330224	25	135	2	
330225	4	135	2	1
330226	3	135	2	1
330227	10	135		
330228	2	135	2	0
330229	28	135	2	
330232	4	135	2	1
330245	**0**	**135**	**0**	**0**
330246	**0**	**135**	**0**	**0**
330247	**0**	**135**	**0**	**0**
330248	**0**	**135**	**0**	**0**
330249	**0**	**135**	**0**	**0**
330250	**0**	**135**	**0**	**0**
330251	**0**	**135**	**0**	**0**
330252	**0**	**135**	**2**	**1**
330253	4	135	2	0
330254	3	135	2	0
330255	25	135	2	
330256	25	135	2	
330257	25	135	2	
330258	2	135	2	2
330259	4	135	2	1
330260	3	135	2	1
330261	28	135	2	
330262	28	135	2	

Conclusion:

On GPS Week 1426 Day 3, there was a Selected C&V Source switch on CRW GUST's coincident with 2 messages with bad CRCs. This was immediately followed by one message, and then a GUS switchover during a 13 second gap. Design specifications indicate that a subsystem failure should be handled smoothly by WAAS without a loss of availability. There was no instantaneous coverage interruption because of multi-Geo coverage. Both the AOR and POR GEOs were functioning normally at the time of this event, and coverage was maintained because of the GEO redundancy. Only CRW experienced this anomaly. According to the WAAS Events Manager, the C&V subsystem failure was due to a communications fault.