WAAS Technical Report
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Pomona, New Jersey
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DR#132: WAAS set PRN 14 to Not Monitored Following the Conclusion of NANU #2016063

GPS Week/Day: Week 1914 Day 5 & Day 6 (9/16-17/16)

Discussion:
The subject NANU on GPS satellite PRN 14 started on 9/15/16 at 18:44 GMT and ended on 9/16/16 at 1:11 GMT. The WAAS set PRN 14 to monitored status with a UDREI of 6 at 1:30 GTM after the satellite ephemeris was set to healthy. The satellite PRN 14 went out of the WAAS service area at 8:15 GMT and was set to WAAS Not Monitored status. When PRN 14 returned to the WAAS service area at 14:30 GMT it was not tracked by the WAAS reference station A or B threads and remained in the not monitored state (UDREI = 14), as shown in figure 1 and 2 (red trace UDREI, green trace expected UDREI), until 9/17/16 at 8:00 GMT. WAAS reference station C threads tracked PRN 14 normally during the event.

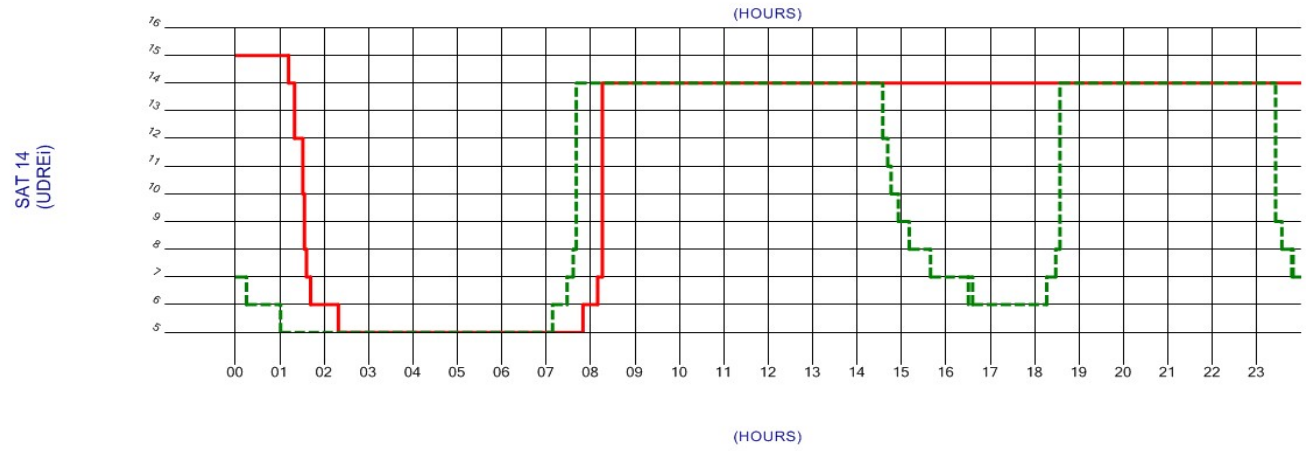

Figure 1 PRN 14 UDREI on 9/16/16

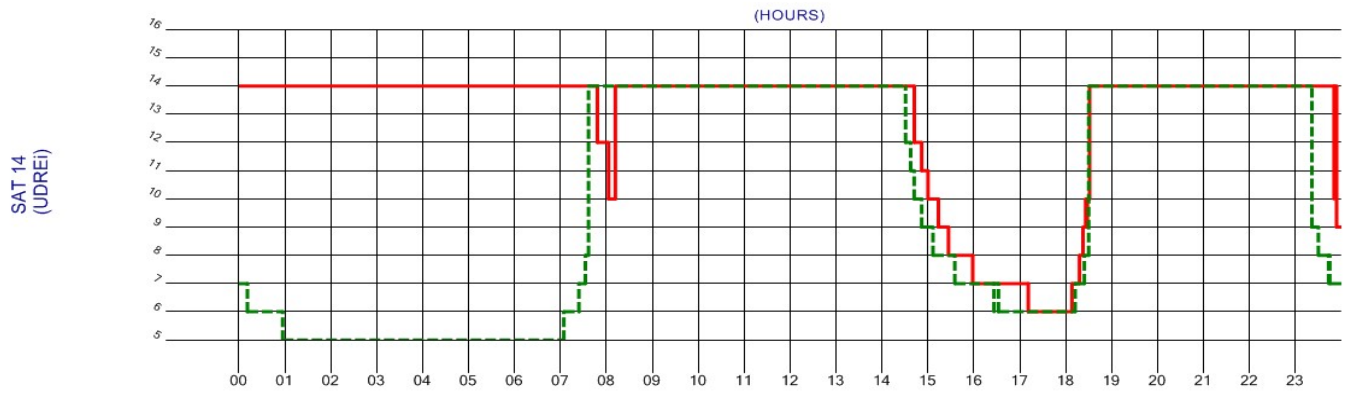

Figure 1 PRN 14 UDREI on 9/17/16

The WAAS LPV200 service was affected since PRN 14 was not monitored for an extended period, even though it was set GPS healthy, between 14:30 on 9/16/16 and 7:45 on 9/17/16. Figure 3 shows WAAS LPV200 service outage at 18:00 GMT for 25 - 35 minutes in North West Alaska on 9/16/16 and figure 4 shows WAAS LPV200 service outage at 2:55 GMT for 7 -25 minutes in the North West California and South West Oregon on 9/17/16.

The thread A and B reference receivers are programed to track all satellites in the broadcast GPS almanac and thread C reference receivers are programed to track all GPS satellites in view. The GPS almanacs collected were reviewed and PRN 14 was not included in the broadcast between 1:00 GMT and 16:30 GMT on 9/16/16. The WAAS thread A and B reference receivers began tracking PRN 14 normally at 7:50 GMT on 9/17/16 and the UDREI reduced to 10 at 8:00 GMT before the satellite went out of the WAAS service area. The GPS almanacs collected showed PRN 14 included starting at 16:30 GMT on 9/16/16 with a time of applicability (TOA) of 61440 GTOW (week = 891).

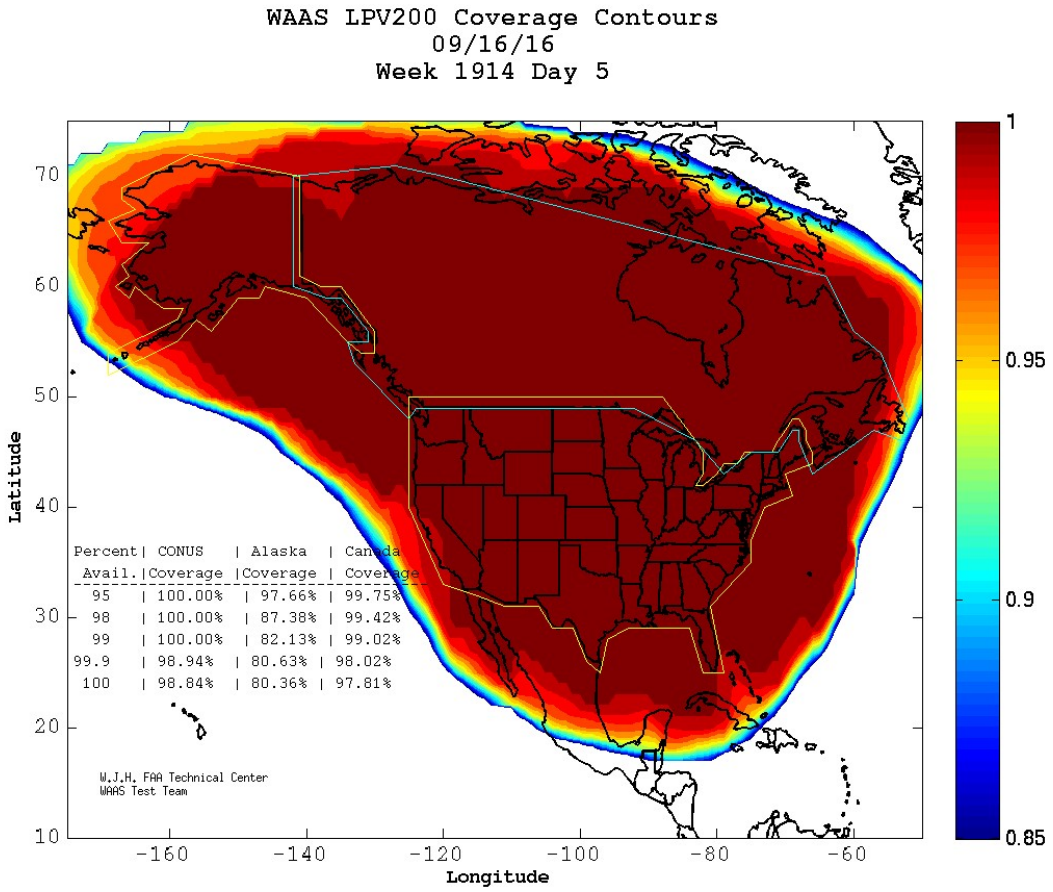

Figure 3 WAAS LPV 200 Coverage 9/16/16

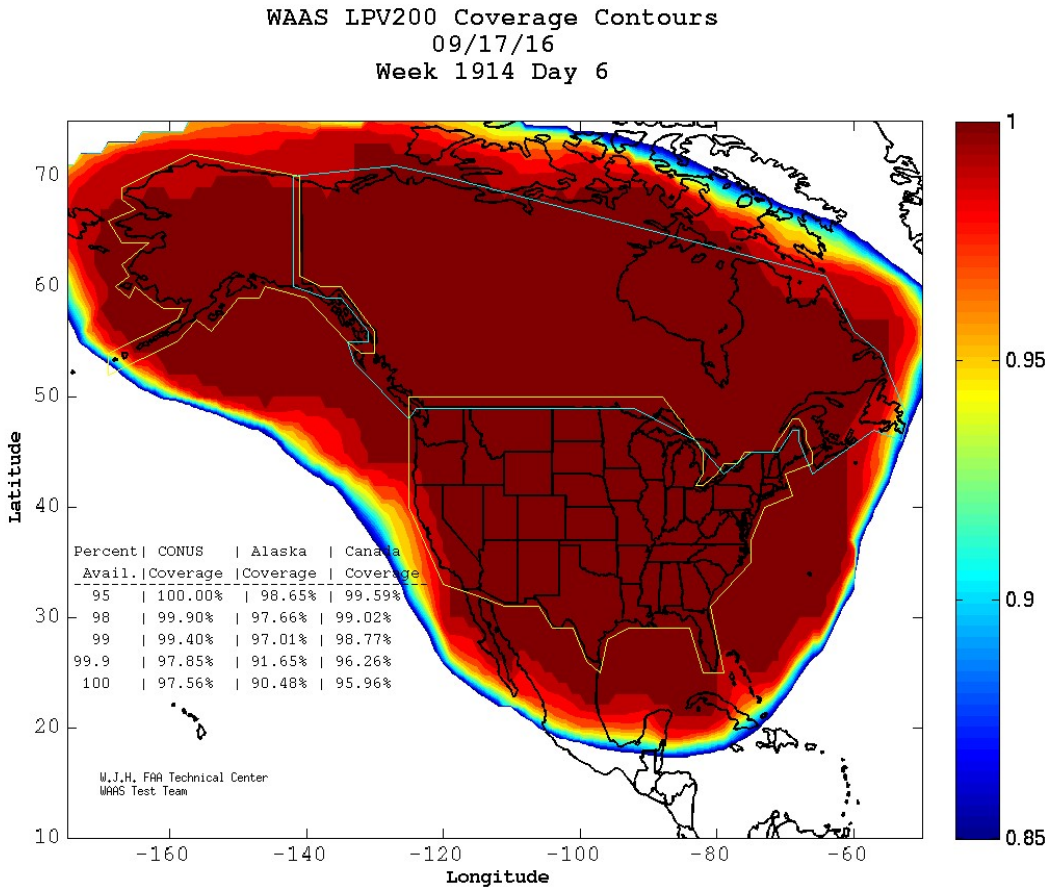

Figure 4 WAAS LPV 200 Coverage 9/17/16

Conclusion:

Following the subject NANU on PRN 14 on 9/16/16, WAAS thread A and B reference station receivers did not track PRN 14, even though the ephemeris data was healthy and after 16:30 GMT on 9/16/16 PRN 14 was included in the satellite almanac. WAAS LPV200 coverage was reduced in Alaska on 9/16/16 and in California on 9/17/16 due to PRN 14 being set to not monitored for an addition 24 hours after the satellite maintenance.