



ASOS Product Improvement Program Replacement Ceilometer System Integration Test (SIT) results

Presented to the ASOS
Test Review Board
September 4, 2008





ASOS Replacement Ceilometer SIT OVERVIEW



- Ceilometer System Integration Test (SIT)

Objective : Demonstrate that the sensor has been integrated into major ASOS configurations (Single Cabinet ASOS, ACU only as a local sensor, Multi-DCP remote sensor(s); test sensor interfaces; and demonstrate system stability.

- ACU only installation executed on 7/15/2008 using Test and Evaluation Branch system in Silver Spring HQ facility (SP0).
- SCA installation executed on 7/24/2008 using the Software Branch Single Cabinet system in Silver Spring HQ facility (1A0)
- Remote sensor installation executed on 8/12/2008 using Observing Systems Branch multi DCP system in Sterling, Va. (ST0).
- Remote sensor integration executed on 8/12/2008 using ST0.
- ACU only integration executed on 7/24/2008 using SP0.
- SCA integration executed on 7/24/2008 using 1A0.
- Stability test executed 8/12 thru 8/15/2008 using ST0.

Note: All SIT procedures executed using pre-production baseline sensors.



ASOS Replacement Ceilometer SIT OVERVIEW (Cont'd.)



- ACU-only local sensor procedure conducted with one pre-production CL31 ceilometer and ASENSE emulation of wind sensor.
 - Premise of test was no existing CT-12K at site.
- Single Cabinet sensor procedure conducted with one pre-production CL31 sensor and ASENSE emulation of full sensor suite.
 - Premise of test was existing CT-12K sensor to be replaced by CL31 replacement sensor.
- Multi-DCP remote sensor procedure conducted with three pre-production CL31 sensors, one legacy CT-12K sensor and full sensor suite.
 - One CT-12K legacy sensor installed on each of 3 DCPs. Meteorological discontinuity on DCP#2 and backup CT-12K on DCP#3 removed and replaced by CL31 replacement sensor, Primary CT-12K on DCP#1 re-configured as test sensor and CL31 installed on spare pedestal.
 - Concurrent operation of 3 CL31 configured as Official Primary, Meteorological discontinuity and Backup sensors demonstrated.
 - Concurrent operation of CL31 configured as Official Primary Sensor and legacy CT-12K configured as “test” sensor demonstrated.
- Stability procedure conducted with system configured as in Multi-DCP case with specific scenarios executed hourly and free play encouraged.
 - 48 hours of operation with three CL31 sensors configured
 - 24 hours of operation with one CL31 and one CT-12K configured.



ASOS Replacement Ceilometer SIT RESULTS



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- ACU-only tests
 - Installation and integration test procedures passed with no issues.
 - SCA tests
 - Installation and integration test procedures passed with no issues, minor corrections made to procedures.
 - Multi-DCP remote sensor tests
 - Installation and integraton test procedures passed, minor corrections made to procedures.
 - One legacy issue (non-ceilometer) was discovered during execution of both procedures. The version of CPU-A BOOT EPROM was incorrectly displayed as UNKNOWN.



ASOS Replacement Ceilometer SIT RESULTS (Cont'd.)



– Stability test

- Test procedure passed with four non-ceilometer legacy discovered during execution:
 1. The version of CPU-A BOOT EPROM was incorrectly displayed as UNKNOWN. (TTR183)
 2. OID2 was displayed as having an UNSIGNED user continuously on the port. (TTR186)
 3. The UPS in DCP #1 and DCP #2 were flagged as having a hardware failure due to communications/watchdog timer issues. (TTR184)
 4. Following a hard reset of DCP #3 sensor data (including ceilometer data) was missing and ceilometer status was inoperative. (TTR185)



ASOS Replacement Ceilometer SIT RESULTS (Cont'd.)



- Disposition of issues:
 1. CPU-A BOOT EPROM version – Reproducible with no operational impact - Converted to Operational Trouble Report OTR ASOSPI-001 – Recommend closing TTR.
 2. OID2 UNSIGNED user – Reproducible with no operational impact – Converted to OTR ASOS PI-002 – Recommend closing TTR.
 3. UPS in DCP flagged as failed – Not reproducible following re-installation of Version 2.79S (cold start) – Recommend converting to Watch Item during ST, OT&E – Converted to OTR ASOSPI-003. Recommend closing TTR.
 4. Missing sensor data resulting from DCP hard reset – System design limitation reproducible but not resolvable – Additional instruction added to Modification Note 80 to eliminate problem. Recommend closing TTR.



ASOS Replacement Ceilometer SIT RECOMMENDATION



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- ASOS PI program will examine limited production baseline sensors to determine if SIT must be re-accomplished.
 - If SIT acceptable, proceed with System Test pending availability of Limited production sensors (week of September 8).