



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric
Administration
NATIONAL WEATHER SERVICE
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MEMORANDUM FOR: Distribution

FROM: W/OPS2 – John Van Kuren (Signed March 20, 2008)

SUBJECT: Operational Test and Evaluation (OT&E) Report for the Automated Surface Observation System (ASOS) Version (V) 2.79E Acquisition Control Unit (ACU) Software

V2.79W diagnostic ACU software has been installed at 20 operational ASOS sites to both mitigate problems associated with the Ice-Free Wind sensor and to archive diagnostic data for download/analysis. V2.79E (11/26/07), identical to V2.79W except for deletion of the diagnostic data archival capability, was developed to allow general deployment of the IFW problem mitigation fixes alone. The V2.79E OT&E occurred at 17 operational ASOS sites from January 8, 2008, through February 15, 2008. Based on the results of the OT&E, the V2.79E software is acceptable for continued use at the OT&E sites. General deployment of V2.79E, however, can take place only if the fixes are determined to be effective. This determination will be based on field experience with V2.79W and V2.79E and the deployment decision will be made by the ASOS Configuration Control Board (ACCB).

Since some fielded ASOS configurations were not evaluated during the OT&E, if the ACCB approves installation of V2.79E at additional sites, performance at those sites should be closely monitored after installation and the option to revert to the previous software version should be available if software-related problems are encountered.

The V2.79E OT&E report is attached and is also posted at:

http://www.nws.noaa.gov/ops2/ops24/documents/asos_v2-79E.htm

If you have any questions or comments, please contact the Test Director, Jerald Dinges, W/OPS24, at 301-713-0326 x160.



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March 2008

**Operational Test and Evaluation (OT&E) Report
for
Automated Surface Observing System (ASOS) Software Version (V) 2.79E**

Introduction and Background

In support of the Observing Systems Branch's (OPS22) ASOS Ice Free Wind (IFW) Problem Resolution Plan, Version (V) 2.79W diagnostic Acquisition Control Unit (ACU) software has been installed at 20 operational ASOS sites to both mitigate problems associated with the IFW sensor and to archive diagnostic data for download/analysis. The subject of this OT&E, V2.79E (11/26/07), is identical to V2.79W except for deletion of the diagnostic data archival capability, and was developed to allow general deployment of the IFW problem mitigation fixes alone. General deployment of V2.79E will take place only if, based on field experience with V2.79W and V2.79E, the fixes are determined to be effective. The deployment decision will be made by the ASOS Configuration Control Board (ACCB).

The purpose of the OT&E was to confirm the operational acceptability of V2.79E (i.e., no negative impact on NWS or FAA operations) for use at field sites. The effectiveness of the IFW problem mitigation fixes is being evaluated by OPS22.

The Test and Evaluation Branch (OPS24) System Test (ST) for V2.79E began on November 29, 2008. On January 2, 2008, the ST was completed successfully and installation of V2.79E for the OT&E was authorized. The OT&E began on January 8, 2008, with the installation of V2.79E at Green Bay (KGRB), WI, and was successfully concluded on February 15, 2008. The ST report, OT&E plan, and this report are posted at:

http://www.nws.noaa.gov/ops2/ops24/documents/asos_v2-79E.htm

Conduct of the OAT

During the OT&E, V2.79E software was installed and its performance evaluated at 17 operational field sites:

Windsor Locks (KBDL), CT
Boston (KBOS), MA
Frenchville (KDVE), ME
Greer (KGSP), SC
Richmond (KRIC), VA

Guadalupe Pass (KGDP), TX
Guymon (KGUY), OK
Memphis (KMEM), TN

Sault Ste. Marie (KANJ), MI
 Green Bay (KGRB), WI
 Grand Rapids (KGRR), MI
 Topeka (KTOP), KS

Spokane (GEG), WA
 San Francisco (KSFO), CA
 Salt Lake City (KSLC), UT

Anchorage (PANC), AK

Hilo (PHTO), HI

A table of characteristics and interfaces for the OT&E sites is included as an appendix. The OT&E sites were selected to provide a wide variety of operational scenarios and ASOS configurations. However, although all Data Collection Platform configurations (single, multiple; meteorological discontinuity and backup), all sensors, and all communications interfaces were represented, there inevitably are some fielded ASOS configurations which were not evaluated with V2.79E during the OT&E.

Results

Installation of V2.79E began on January 8, 2008, and all 17 OT&E sites were operating with V2.79E on January 31, 2008.

SID	Site Name	V2.79E Install Date	Days of Operation
KGRB	Green Bay, WI	01/08/08	38
KBDL	Windsor Locks, CT	01/10/08	36
KBOS	Boston, MA	01/10/08	36
KGUY	Guymon, OK	01/10/08	36
KSLC	Salt Lake City, UT	01/10/08	36
PANC	Anchorage, AK	01/14/08	32
KGEG	Spokane, WA	01/15/08	31
KSFO	San Francisco, CA	01/15/08	31
KRIC	Richmond, VA	01/16/08	30
KANJ	Sault Ste. Marie, MI	01/16/08	30
KGRR	Grand Rapids, MI	01/16/08	30
PHTO	Hilo, HI	01/17/08	29
KMEM	Memphis, TN	01/18/08	28
KGSP	Greer, SC	01/27/08	19
KTOP	Topeka, KS	01/30/08	16
KGDP	Guadalupe Pass, TX	01/30/08	16
KFVE	Frenchville, ME	01/31/08	15
Total site-days of operation		As of 02/15/08	489

At the completion of the OT&E evaluation period (February 15, 2008), a total of 489 site-days of operation had been accumulated with V2.79E software installed. During the evaluation period, site focal points monitored ASOS performance for problems and only one operational problem was reported. The ASOS at Salt Lake City (KSLC), UT, experienced an unexplained system lockup on February 13. When a coldstart was

performed, the processor "lost" the V2.79E software. After replacement of the processor board and reloading of V2.79E, the system was successfully returned to service and has continued to perform normally. Coldstarts performed on test systems at the Sterling Research and Development Center, Sterling, VA, did not exhibit the problem noted at KSLC. This problem is documented in Test Trouble Report #175 as a watch item.

Prior to and during the evaluation period, OPS24-developed script programs were used to remotely download SYSLOG messages for review and analysis. For nine sites (those for which "baseline" data for January 1-14 was available), the SYSLOG messages for the 14-day V2.79E evaluation period (February 1-14) were compared to the messages for the baseline period, during which all OT&E sites had V2.79D ACU software installed. The total number of messages increased slightly (+8%) with V2.79E. The total number of messages, however, is an imprecise and often misleading measure of performance. For example, 22 messages associated with a dewpoint sensor problem at one site accounted for more than 9% of the total. A review of the messages related to the IFW sensor provided results as follows:

		<u>Baseline</u> (V2.79C/D)	<u>Evaluation</u> (V2.79E)
ST 1785	Sensor Response Timeout	2	0
ST 1786	Data Quality Check Error	2	0
ST 1790	Sensor is Operational	4	0
<u>ST 1791</u>	<u>Sensor is Inoperational Data Quality Error</u>	<u>6</u>	<u>0</u>
Total		14	0

For the other message associated with the IFW sensor (ST 1794 - Average Peak Direction/Speed Error), the increase in the number of messages (from 1 to 4) was expected with V2.79E because the criteria for the message and its content was revised to provide additional IFW sensor diagnostic data.

When queried regarding ASOS performance with V2.79E, the site focal points reported either "no change", "no problems", or, in two cases, improved wind sensor performance.

In summary, the operational acceptability of V2.79E was demonstrated.

Recommendation

Based on the results of the OT&E, the V2.79E software is acceptable for continued use at the OT&E sites. Since some fielded ASOS configurations were not evaluated during the OT&E, if the ACCB approves installation of V2.79E at additional sites, performance at those sites should be closely monitored after installation and the option to revert to the previous software version should be available if software-related problems are encountered.

Appendix

ASOS V2.79E OT&E Site Characteristics and Interfaces

SID	Name	Staffing	DCPs	Multiple Sensors	ZR	IFW	AWPAG	Comms	TSTM/ALDARS	GTA/ATIS	ACE	RVR	WSP	S/W Version
BDL	Windsor Locks, CT	FT	2 DCP	M/B	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	---	RVR	WSP	2.79D
BOS	Boston, MA	FT	3 DCP	M/B	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	ACE	RVR	---	2.79D
FVE	Frenchville, ME	---	1DCP	---	ZR	IFW	---	ADAS	ALDARS	GTA	---	---	---	2.79D
GSP	Greer, SC	PT	2 DCP	remote wind	ZR	---	AWPAG	ADAS	ALDARS	ATIS	---	---	---	2.79D
RIC	Richmond, VA	FT	1 DCP	---	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	ACE	RVR	---	2.79D
GRB	Green Bay, WI	PT	1 DCP	B	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	---	---	---	2.79D
GRR	Grand Rapids, MI	FT	2 DCP	M	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	---	---	WSP	2.79D
TOP	Topeka, KS	PT	1 DCP	---	ZR	IFW	AWPAG	ADAS	ALDARS	GTA	----	---	---	2.79D
GDP	Guadalupe Pass, TX	---	SCA w/DCP&OID	---	ZR	IFW	AWPAG	DIAL	---	---	---	---	---	2.83
GUY	Guymon, OK	---	SCA	---	---	IFW	AWPAG	ADAS	ALDARS	GTA	---	---	---	2.79D
MEM	Memphis, TN	FT	3 DCP	M	---	---	AWPAG	ADAS	ALDARS	ATIS	---	RVR	---	2.79D

SID	Name	Staffing	DCPs	Multiple Sensors	ZR	IFW	AWPAG	Comms	TSTM/ALDARS	GTA/ATIS	ACE	RVR	WSP	S/W Version
GEG	Spokane, WA	FT	1 DCP	---	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	---	RVR	WSP	2.79D
SFO	San Francisco, CA	FT	3 DCP	M/B	---	IFW	AWPAG	ADAS	ALDARS	ATIS	ACE	RVR	---	2.79D
SLC	Salt Lake City, UT	FT	2 DCP	B	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	---	RVR	---	2.79D
PANC	Anchorage, AK	FT	2 DCP	M	ZR	IFW	AWPAG	ADAS	ALDARS	ATIS	---	RVR	---	2.79D
PHTO	Hilo, HI	FT	1 DCP	---	---	IFW	AWPAG	ADAS	ALDARS	ATIS	ACE	---	---	2.79B