



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric
Administration
NATIONAL WEATHER SERVICE
1325 East-West Highway
Silver Spring, Maryland 20910-3283

MEMORANDUM FOR: Distribution

FROM: W/OPS2 – John Van Kuren (Signed January 30, 2008)

SUBJECT: Field Verification Test (FVT) Report for the Automated Surface
Observation System (ASOS) Version (V) 2.79W Acquisition
Control Unit (ACU) Software

The Test and Evaluation Branch (OPS24) conducted the V2.79W FVT in support of the Observing Systems Branch's (OPS22) ASOS Ice Free Wind (IFW) Problem Resolution Plan. During the FVT, V2.79W was installed and evaluated at 13 operational ASOS sites with a history of IFW problems. Installation of the software was straightforward and software performance was monitored by both OPS24 and site focal points for a minimum of two weeks at each site (a total of 370 site-days). During the FVT, satisfactory observations were consistently produced and transmitted; interfaces with other systems functioned as required; ASOS system stability was not degraded; IFW diagnostic data was available for analysis; and no operational problems were reported.

Based on its performance during the FVT, the V2.79W software is considered acceptable for continued use at the FVT sites. V2.79W is not intended for general distribution but installation at some additional sites with IFW problems may be approved by OPS22.

The V2.79W FVT report is attached and is also posted at:

http://www.nws.noaa.gov/ops2/ops24/documents/asos_v2-79W.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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**Field Verification Test (FVT) Report
for
Automated Surface Observing System (ASOS) Software Version (V) 2.79W**

Introduction and Background

In support of the Observing Systems Branch's (OPS22) ASOS Ice Free Wind (IFW) Problem Resolution Plan, diagnostic Acquisition Control Unit (ACU) software, Version (V) 2.79W, was installed at 13 operational ASOS sites to both mitigate problems associated with the IFW sensor and to archive diagnostic data for remote download and analysis. The purpose of the FVT was to confirm the operational acceptability of V2.79W (i.e., no negative impact on NWS or FAA operations) for use at field sites while archiving diagnostic data. The V2.79W software is expected to remain installed at the 13 FVT sites (and possibly others) for approximately one year.

The Test and Evaluation Branch (OPS24) System Test (ST) for V2.79W began on November 5, 2008. On November 15, 2008, the ST was completed successfully and installation of V2.79W for the FVT was authorized. The FVT successfully concluded on January 2, 2008. The ST report, FVT plan, and this report are posted at:

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

Conduct of the OAT

During the FVT, V2.79W software was installed and its performance evaluated at 13 sites where IFW sensor-related problems have been reported:

Atlantic City (KACY), NJ
Cleveland-Hopkins (KCLE), OH

Baton Rouge (KBTR), LA
Fort Stockton (KFST), TX
Melbourne (KMLB), FL

Detroit (KDET), MI
Louisville (KSDF), KY
Pueblo (KPUB), CO
Springfield (KSPI), IL

Maryville (KMYV), CA
Salinas (KSNS), CA
Santa Rosa (KSTS), CA
The Dalles (KDLS), OR

A table of characteristics and interfaces for the FVT sites is included as an appendix. It should be noted that the FVT sites were selected on the basis of IFW sensor-related problems rather than specific site configurations. As a result, some fielded configurations were not evaluated.

Since birds are believed to be responsible for many of the problems at IFW sites, additional tools to aid in resolution of the IFW problems will be installed at 12 of the sites as follows:

Site	FAA Bird Abatement Hardware	NWS Bird Perch Hardware	Data Logger and Video Camera
Atlantic City (KACY), NJ		X	
Cleveland (KCLE), OH	X		
Detroit (KDTW), MI	X		
Pueblo (KPUB), CO		X	
Louisville (KSDF), KY	X		
Springfield (KSPI), IL		X	X
Baton Rouge (KBTR), LA		X	X
Fort Stockton (KFST), TX	X		
Melbourne (KMLB), FL	X		X
The Dalles (KDLS), OR		X	
Maryville (KMYV), CA	X		X
Santa Rosa (KSTS), CA		X	

Note: The bird devices, data logger, and video camera were not evaluated as part of the FVT.

Results

Installation of V2.79W began on November 29, 2008, and all 13 FVT sites were operating with V2.79W on December 13, 2008.

SID	Site Name	V2.79W Install Date	Days of Operation
KFST	Fort Stockton, TX	11/29/07	34
KMLB	Melbourne, FL	11/29/07	34
KPUB	Pueblo, CO	11/29/07	34
KSDF	Louisville, KY	11/29/07	34
KBTR	Baton Rouge, LA	11/30/07	33
KCLE	Cleveland-Hopkins, OH	11/30/07	33
KDTW	Detroit, MI	12/04/07	29
KSPI	Springfield, IL	12/04/07	29
KDLS	The Dalles, OR	12/07/07	26
KMYV	Maryville, CA	12/11/07	22
KACY	Atlantic City, NJ	12/12/07	21
KSTS	Santa Rosa, CA	12/12/07	21
KSNS	Salinas, CA	12/13/07	20
Total site-days of operation		As of 01/02/08	370

At the completion of the FVT evaluation period (January 2, 2008), a total of 370 site-days of operation had been accumulated with V2.79W software installed. During the evaluation period, site focal points monitored ASOS performance for problems and none were reported.

Prior to and during the evaluation period, OPS24-developed script programs were used to remotely download observations (METARs, SPECIs, 5-minute), 12 hour data, sensor data, and SYSLOG messages for review and analysis. The SYSLOG messages for the 19-day V2.79W evaluation period (December 15 - January 2) were compared to the messages for a 15-day baseline period (November 1-15), during which all FVT sites had either V2.79C or V2.79D ACU software installed. Although the number of SYSLOG messages is an imprecise measure of software performance, the reduction in messages reported during the evaluation period (556) compared to the baseline period (670) indicates improved performance.

Since most of the changes in V2.79W are related to the IFW sensor, the SYSLOG messages associated with that sensor were of particular interest. For the following IFW-related SYSLOG messages:

		<u>Baseline</u> (V2.79C/D)	<u>Evaluation</u> (V2.79W)
ST 1785	Sensor Response Timeout	14	10
ST 1786	Data Quality Check Error	45	34
ST 1790	Sensor is Operational	49	33
ST 1791	Sensor is Inoperational Data Quality Error	51	33
Total		159	110

a reduction in the number of occurrences is an indication of improved performance.

For the other message associated with the IFW sensor (ST 1794 - Average Peak Direction/Speed Error), the increase in the number of messages (from 22 to 33) was expected with V2.79W because the criteria for the message and its content was revised to provide additional IFW sensor diagnostic data.

In summary, the operational acceptability of V2.79W was demonstrated and performance (based on the number of SYSLOG messages) was generally improved compared to previous versions (V2.79C/D).

Recommendation

Based on the results of the FVT, the V2.79W software is acceptable for continued use at the FVT sites. If V2.79W is to be installed at additional sites (to be selected by OPS22), performance at those sites should be monitored closely following installation since not all ASOS configurations were evaluated during the test.

Appendix

Table - ASOS V2.79W Field Verification Test Site Characteristics and Interfaces

SID	Name	FAA Service Level	Staffing	DCPs	Multiple Sensors	Comms	ZR	TSTM/ALDARS	GTA/ATIS	ACE	RVR	WSP	AWPAG	Current Software Version
KACY	Atlantic City, NJ	C	PT	1	---	DIAL	ZR	---	ATIS	ACE	---	WSP	AWPAG	2.79D
KCLE	Cleveland, OH	A	FT	2	M/B	H/W	ZR	---	ATIS	---	---	---	AWPAG	2.79C
KDTW	Detroit, MI	A	FT	3	B	ADAS	ZR	ALDARS	ATIS	---	RVR	---	AWPAG	2.79D
KPUB	Pueblo, CO	D	PT	1	---	ADAS	ZR	ALDARS	ATIS	---	---	---	AWPAG	2.79D
KSDF	Louisville, KY	A	FT	1	---	H/W	ZR	---	ATIS	---	RVR	---	AWPAG	2.79D
KSPI	Springfield, IL	C	PT	1	B	ADAS	ZR	ALDARS	ATIS	---	---	---	AWPAG	2.79D
KBTR	Baton Rouge, LA	B	FT	1	---	DIAL	--	---	ATIS	---	RVR	---	AWPAG	2.79D
KFST	Fort Stockton, TX	D	---	1	---	ADAS	---	ALDARS	GTA	---	---	---	---	2.79D
KMLB	Melbourne, FL	C	PT	1	---	ADAS	---	ALDARS	ATIS	---	---	---	---	2.79D
KDLS	The Dalles, OR	D	---	1	---	ADAS	ZR	ALDARS	GTA	---	---	---	---	2.79D
KMYV	Maryville, CA	D	---	1	---	ADAS	---	ALDARS	GTA	---	---	---	---	2.79D
KSNS	Salinas, CA	C	PT	1	---	ADAS	---	ALDARS	ATIS	ACE	---	---	---	2.79D
KSTS	Santa Rosa, CA	C	PT	1	---	ADAS	---	ALDARS	ATIS	ACE	---	---	---	2.79C

All sites have IFW sensors