

Factual Report – Attachment 8

Record of conversation with the Maintenance Manager for ASOS Program at the National Weather Service.

METEOROLOGY

WPR19FA084

*Submitted by: Mike Richards
NTSB, AS-30*



RECORD OF CONVERSATION

Date:	September 12, 2019
Time:	1300-1350 eastern daylight time
Location:	Telephone
Person Contacted:	Mr. Joseph Devost, Maintenance Manager for ASOS Program, National Weather Service
Persons Present:	Mr. Mike Richards, National Transportation Safety Board Mr. Art Patrick, National Weather Service Ms. Lora Wilson, National Weather Service
Subject:	Accident Investigation WPR19FA084

On September 12, 2019, at 1300 eastern daylight time (EDT), Mr. Mike Richards of the National Transportation Safety Board, Mr. Art Patrick of the National Weather Service (NWS) and Ms. Lora Wilson of the NWS had a telephone conversation with Mr. Joseph Devost from the NWS. During the conversation Mr. Devost reported the following (*italicized content and Table 3-1 were provided by Mr. Devost following the conversation*):

He is the Maintenance Manager for the NWS' ASOS program. The "ASOS Maintenance Note 18, Revision A" found in section 2.6 of Engineering Handbook 11 and its "Attachment A – List of ASOS Spares Kits" have not been revised since 2008. *The spares kit consists of parts that are most likely to fail and will most likely interrupt Air Port Operations. The National Logistics Support Center (NLSC) carries 655 parts in the warehouse to support the Automated Surface Observing System (ASOS). Most of these parts are available to Electronics Technicians via emergency order overnight shipment. Large parts such as wind towers cannot be flown overnight.* He has not heard of a "limited" list of spare ASOS parts and Attachment A is the only spare ASOS parts list he is aware of. It is expected that all NWS Weather Forecast Offices (WFO) have every part listed in Attachment A on hand at their facilities, however sometimes there are issues back-ordering parts. He does not know if any NWS regions have made changes to the spare parts list, but Attachment A (from ASOS Maintenance Note 18 Revision A) is the only list from NWS headquarters and *changes to the parts list are not allowed. Every spare part used in ASOS is part of a baseline. Technicians are not allowed to use any repair parts that are not part of the baseline. Technicians are expected to order replacements when spares are installed.*¹ ASOS parts must be delivered by the National Logistics Support Center.

¹ Mr. Devost referenced the following source: *Maintenance Note 56 Unauthorized Modifications to ASOS. Posted*

Source: NOAA8102 Contingency Plan v4.0 2019

Service Level D locations are "stand-alone" sites and have no observer interface. ASOS provides an automated report that includes wind speed and direction, visibility, precipitation and obstructions to vision, cloud height and sky cover, temperature and dew point, and altimeter. Some sites have freezing rain and lightning sensors. The AOMC can access the entire system at all levels for remote maintenance and diagnostics. For a cold start, the configuration data is downloaded from the AOMC using a dial-up connection.

An ASOS performs continuous monitoring of its sensors. If a wind sensor goes down (for example), a "\$" will appear in the METAR and the ASOS Monitoring Center (AOMC) is notified. The AOMC will poll the ASOS and look for the problem in the maintenance page and trace down the failed sensor. At this point a ticket is opened and the clock starts on resolution (as described in NWS Instruction 30-2111 – Appendix B). The ticket is closed when an ASOS technician goes to the site within 36 hours (in the case of a safety-related failure for a Service Level D airport) and calls or e-mails the AOMC stating the problem has been fixed.

Source: NOAA8102 Contingency Plan v4.0 2019

The following activities occur during recovery of NOAA8102:

Built into each ASOS are automated self-diagnostics and QC algorithms. These QC algorithms operate on raw sensor data; they prevent questionable data from being included in the One-Minute-Observation (OMO) or the transmitted METAR/SPECI. When the ASOS detects either a qualifying degree of system degradation, component failure, or data error, the relevant data are excluded from report processing and a Maintenance Check Indicator (\$) is appended to the METAR/SPECI report. If sufficient raw data are not available for report processing, the element is not included in the OMO or METAR/SPECI report. The \$ is used to indicate that maintenance may be needed but does not necessarily mean that the data are erroneous. Onsite observers may also augment and/or backup the ASOS METAR/SPECI data at selected locations. These observers provide an immediate data check and often catch problems before the observation is transmitted (Ft Nt ASOS USER Guide).

Source: NOAA8102 Contingency Plan v4.0 2019

ASOS Trouble Monitoring: The AOMC monitors all ASOS METAR's through an NWS computer system known as the gateway. If a particular ASOS maintenance flag (\$) in METAR or if the AOMC fails to receive a METAR during the proper time period, the AOMC notes hardware problem with that ASOS site. The AOMC operator then uses a remote maintenance monitor to further investigate the problem and then notifies the appropriate maintenance personnel. In the event the problem cannot be fixed remotely, a trouble ticket is created and the WFO is notified to take corrective action by dispatching an Electronics Technician to the problem site.

Human weather observers at Service Level A and B airports can augment observations if they do not agree with what the ASOS is reporting. If a sensor fails at a Service Level D airport the ASOS will give no data. It is better to have no data than bad data. Meteorologists at NWS WFOs do not perform ASOS technician functions, and ASOS technicians can't alter (augment) observations. He is not aware of policy related to NWS WFO meteorologists having access to turn off report processing for working ASOS sensors, or any negotiation between meteorologists and ASOS technicians on turning off report processing. *However, he referenced Table 3-1 below that illustrates the individual user permissions² and indicated that sensor report processing can be turned off and on by Observers, Air Traffic Controllers, Technicians, and System Managers, and that Version 3.10 software added a Critical Password to the permissions structure. Parameters that could affect aviation safety require entry of a Critical Password.* His personal opinion is that if there is a discrepancy in an observation, turn it off, replace the sensor and then take a look at repairing the sensor, but no data is better than bad data. If a human weather observer is present at the site, they can augment the observation.

² Mr. Devost referenced the following source: *Software User's Manual for the Automated Surface Observing System. Posted on the ASOS Technicians Home Page.*

Table 3-1. ASOS Function / User Cross Reference

Function	UNS	OBS	ATC	TEC	SYS
SIGN Function	X	X	X	X	X
Review Capability	X	X	X	X	X
Print Capability (except remote users)	X	X		X	X
Review METAR/SPECI Reports	X	X	X	X	X
Review SHEF Messages	X	X		X	X
Review 5-Minute Observations	X	X	X	X	X
Review Daily Summary Products and Messages	X	X		X	X
Review Monthly Summary Products and Messages	X	X		X	X
Review 1-minute sensor data archived for the last 12 hrs	X	X		X	X
Review 1-minute current sensor data	X	X		X	X
Review Edit Log		X	X	X	X
Review System Maintenance Log	X	X		X	X
Review Communications Log	X	X		X	X
Print the 1-Minute Screen with auxiliary data	X	X		X	X
Activate and deactivate the audible alarms	X	X	X	X	X
View auxiliary parameters	X	X	X	X	X
Examine which sensors/parameters are in manual mode because of user editing of weather data	X	X	X	X	X
Examine the release number and date of the installed operational software	X	X		X	X
Access the system HELP function	X	X	X	X	X
Generate SPECI reports using the current 1-minute observation		X	X		
Generate tornadic SPECI reports		X	X		
Transmit a SPECI Early/Transmit Corrected Reports		X			
Enter a tower visibility		X	X		
Cancel a pending SPECI report		X			
Edit and/or augment automatically generated weather products (1-minute observation)		X	X†		
† Limited to present weather and remarks fields.					

Table 3-1. ASOS Function/User Cross Reference (Continued)

Function	UNS	OBS	ATC	TEC	SYS
Turn sensor report processing on or off.		X	X	X	X
Add/change elements in daily and monthly summary products during the time periods the summaries are available for changing.		X			
Request 2-hour archive of 5-minute observations		X	X	X	X
Select automated voice output for dial-in telephone and radio			X	X	
Manually record a 90-second message, i.e., NOTAM, at the end of the automated voice with the OID handset.			X	X	
Erase manually recorded 90-second voice message, i.e., NOTAM, just recorded.			X	X	
Playback manually recorded 90-second voice message, i.e., NOTAM, over the OID speaker.			X	X	
Change system configuration of sensors/display devices.				X	X
Execute/review results of system diagnostic/tests.				X	X
Change selected physical site constants.				X	X
Change selected hardware configuration constants.				X	X
Change selected external communications configuration constants.				X	X
Change selected sensor configuration constants.				X	X
Change selected ACU serial communications configuration.				X	X
Make entries in the system maintenance log.				X	X
Reset system hardware and software.				X	X
Reset DCPs.				X	X
Assign/change remote access code and passwords.					X
Change selected site parameters: Special, local and SHEF alert criteria Site pressure data					X
Process Hot Keys			X		

Conversation ended at approximately 1350 EDT.

Mike Richards
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National Transportation Safety Board