

Weather Study – Attachment 1

Email communication with the Federal Aviation Administration regarding sky condition reporting at SEE.

METEOROLOGY

WPR18FA084

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

Richards Michael

From: [REDACTED]
Sent: Wednesday, May 30, 2018 12:36 PM
To: Richards Michael <[REDACTED]>
Cc: [REDACTED]
Subject: NTSB Request 18-145

Hi Mike,

This is in response to NTSB Request 18-145. The FAA's Office of Weather Sensors and Display Systems looked at the initial data and came to the conclusion that they could not answer the questions. That office reached out to the manufacturer of the AWOS and they do not have detailed data for this particular site. However, the manufacturer is going to look into similar sites to see if the questions can be answered. This may take a few weeks to complete.

Regards,

Anne

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Richards Michael

From: [REDACTED]
Sent: Thursday, October 4, 2018 12:27 PM
To: Richards Michael <[REDACTED]>
Cc: [REDACTED]
Subject: NTSB Request 18-145

Hi Mike,

Sorry it has taken so long to get back to you on this request. Please see the information below in response to NTSB Request 18-145.

Question 1 Stated:

1. Where are the AWI (All Weather Incorporated) model 900 AWOS systems installed and operational; we would like to look at a sampling of those reports to see if there are any similarities.

FAA Response:

The AWI system at Gillespie Field, El Cajon, CA (KSEE) is their model 3000 AWOS, which includes the model 8339 ceilometer.

Based on this information, AWI was asked to identify several other sites in the west coast area that have the same model 3000 system and model 8339 ceilometer. AWI identified the following sites:

ID	Site	State
KC83	Byron	CA
KCIC	Chico	CA
KCVH	Marin County, Novato	CA
KFOT	Rohnerville	CA
KHAF	Half Moon Bay	CA
KO54	Weaverville	CA
KSQL	San Carlos	CA
K3S8	Grants Pass	OR
KS39	Prineville	OR
KAUN	Auburn	CA

For the purposes of this evaluation:

- The Iowa Environmental Mesonet web site was accessed to download archived METAR records from these sites for the period of 1/1/2018 to 10/1/2018.
- Only automated METARs (i.e. ones containing the word "AUTO") were considered. Manually generated METARs (i.e. ones that do not contain the word "AUTO") were not considered because there is no way of determining why the observer decided to not include the sky condition.
- Only automated METARs, as discussed above, containing at least one weather parameter were considered. Automated METARs that did not have at least one weather parameter were considered invalid because the lack of any weather parameters would indicate a data collection problem common to the entire sensor site. This is unrelated to the performance of the ceilometer.

The downloaded METARs from these sites were evaluated with the following results:

SITE*	TOTAL METARS	AUTO METARS	INVALID AUTO METARS (ALL SENSORS MISSING)	VALID AUTO METARS	VALID AUTO METARS, SKY CONDITION MISSING	PERCENT VALID METARS, SKY CONDITION MISSING	NOTES
FOT	19591	19591	1	19590	2	0.010%	
SQL	15411	11492	0	11492	5	0.044%	
S39	19647	19647	0	19647	9	0.046%	
AUN	19563	19563	237	19326	24	0.124%	
CIC	11885	8449	0	8449	22	0.260%	
3S8	19488	19488	31	19457	82	0.421%	
CVH	19442	19442	111	19331	108	0.559%	
HAF	29830	29830	76	29754	218	0.733%	
C83	4257	4257	0	4257	36	0.846%	(FIRST ENTRY 8/3/18)
O54	14143	14143	66	14077	102	0.725%	

* See below for column definitions.

By comparison, KSEE METARs from the same period showed the following results:

SITE*	TOTAL METARS	AUTO METARS	INVALID AUTO METARS (ALL SENSORS MISSING)	VALID AUTO METARS	VALID AUTO METARS, SKY CONDITION MISSING	PERCENT VALID METARS, SKY CONDITION MISSING	NOTES
SEE	11740	7870	0	7870	725	9.212%	

* See below for column definitions.

Column Definitions:

SITE: Site ID

TOTAL METARS: Number of METARs received from the Iowa Environmental Mesonet web site

AUTO METARS: Number of METARs containing the word "AUTO", indicating the METAR has not been modified by a weather observer

INVALID AUTO METARS (ALL SENSORS MISSING): Number of METARs containing the word "AUTO" and do not contain any weather information

VALID AUTO METARS: Number of METARs containing the word "AUTO" and containing at least one weather parameter [equals AUTO METARS minus INVALID AUTO METARS (ALL SENSORS MISSING)]

VALID AUTO METARS, SKY CONDITION MISSING: Number of METARs containing the word "AUTO", containing at least one weather parameter however the sky condition is missing

PERCENT VALID METARS, SKY CONDITION MISSING: Number of METARs containing the word "AUTO" containing at least one weather parameter however the sky condition is missing expressed as a percentage of the number of valid auto METARs [equals VALID AUTO METARS, SKY CONDITION MISSING divided by VALID AUTO METARS expressed as a percentage]

Conclusion:

Based on this comparison, it appears the ceilometer at KSEE is experiencing significantly more conditions causing the sky condition to go missing than ceilometers at the other sites.

Based on these findings, steps have been initiated to have the site's non-Federal technician of record provide the necessary information to AWI to help identify the root source of the issue. Once the root source is identified, an action plan can be formulated to resolve the issue.

Regards,

Anne

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Richards Michael

From: [REDACTED]
Sent: Wednesday, November 21, 2018 11:39 AM
To: Richards Michael [REDACTED]
Cc: [REDACTED]
Subject: NTSB Request 18-145

Hi Mike,

This is to close out the final action item identified in the second paragraph of the conclusion discussion from the May 30 response that I sent.

The manufacturer of the KSEE non-Fed AWOS, All Weather Inc. (AWI) was asked to provide an assessment of the KSEE non-Fed AWOS ceilometer diagnostic data.

This required making the necessary arrangements to allow AWI to access the site remotely to download the system logs, maintenance logs, diagnostic data, archives, etc. or to have the technician of record or the airport manager copy this information to a removable media and send it to AWI.

After several failed attempts to arrange remote access and/or access via the technician of record, AWI was able to gain access to the necessary diagnostics data with the help of the airport manager.

The ceilometer includes the sensors and logic necessary to determine when the glass window surface is significantly dirty as to interfere with the ceilometer's ability to evaluate the sky condition. The logic identifies alert and alarm conditions. An alert is issued when the ceilometer window is dirty; however, it is still able to function. An alarm is issued when the ceilometer window is so dirty that it is no longer able to function.

Once the data was downloaded, AWI was able to identify two possibilities:

- Activity (insect for example) that is happening on a regular basis causing the ceilometer to truly see a dirty window.
- The sensor used to detect the dirty window condition is no longer in calibration.

The dirty window detection levels can be recalibrated in the field by a knowledgeable technician. Beyond routine cleaning maintenance, recalibration is normally the first step when this type of issue is seen. Because this issue is indicated both in the logs as well as in the METARs the need for recalibration would normally be detected during regular maintenance.

Based on these findings, the FAA will be advising the KSEE sponsor to direct their authorized non-Fed technician to recalibrate the ceilometer dirty window sensor and logic during the next regular visit. Additionally, the sponsor or designee will be required to use the AWOS's RMM capability to monitor the maintenance logs for the recurrence of dirty window alarms and alerts and provide the FAA Non-Federal AWOS National Certification & Approval office with monthly summaries.

Have a Happy Thanksgiving.

Anne

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