THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

September 23, 2011

The Honorable Carolyn Lerner
Special Counsel
U.S. Office of Special Counsel
1730 M Street, NW, Suite 218
Washington, DC 20036

Re: OSC File Nos. DI-08-2777, DI-08-3157, and DI-11-0165

Dear Ms. Lerner:

By letter dated February 28, 2011, Associate Special Counsel William Reukauf referred for investigation disclosures from Vincent Sugent, an Air Traffic Controller at the Detroit Metropolitan Wayne County Airport (DTW) Air Traffic Control Tower. Mr. Sugent alleged that: (1) Federal Aviation Administration (FAA) officials improperly attributed operational errors and deviations to DTW air traffic controllers for violating local orders or directives; (2) the Automated Surface Observing System (ASOS) and Wind Measuring Equipment (WME) at DTW continue to display significantly different wind measurements, resulting in an "unsafe and untenable situation for controllers and the flying public;" and (3) air traffic controllers are unable to electronically issue Standard Instrument Departures (SIDs) to aircraft departing DTW for several airports in Ohio, resulting in a "substantial and specific danger to public safety." I delegated investigation responsibility to the Office of Inspector General (OIG). Enclosed are the Report of Investigation and FAA Administrator Babbitt's response.

In summary, OIG was unable to substantiate Mr. Sugent's allegations. Specifically, OIG reports:

(1) Mr. Sugent's allegation that FAA officials improperly attributed operational errors and deviations to DTW controllers for violating local orders of directives was unfounded. The evidence indicates the facility issued operational errors and deviations based on definitions provided in FAA Order 7210.56C, a national order.

(2) Although the ASOS and WME continue to provide disparate wind measurements at times, these disparities do not result in an "unsafe and untenable situation for controllers and the flying public."

(3) Although the issuance of SIDs may increase the safety and efficiency of providing aircraft with departure information, providing such information verbally is not unsafe and remains an approved FAA procedure.

FAA Administrator Babbitt reviewed OIG's findings and agrees with them. Nonetheless, the FAA intends to complete a safety risk analysis to determine the hazards associated with

DTW's desire to change its primary wind source from the ASOS to the WME and collect data to isolate any technical reason for the divergent readings of the two devices and help eliminate random differences. The FAA also intends to improve the timely release of air traffic from DTW by changing published SIDs so they can be issued to aircraft departing to the Ohio airports.

I appreciate Mr. Sugent's diligence in raising these concerns.

Sincerely yours,

Ray LaHood

Enclosures

U.S. Department of Transportation
Office of Inspector General

REPORT OF INVESTIGATION	INVESTIGATION NUMBER #I11A001SINV	DATE Aug. 26, 2011
TITLE Air Traffic Management at Detroit Metropolitan Wayne County Airport	PREPARED BY: Brian Uryga Senior Attorney/Investigator Special Investigations, JI-3	STATUS FINAL
	DISTRIBUTION AJO-1, AAE-1	APPROVED BY: JI-3 RCE

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BACKGROUND

On approximately February 28, 2011, U.S. Secretary of Transportation Ray LaHood received a letter from the U.S. Office of Special Counsel (OSC) referring for investigation several disclosures made by an Air Traffic Control Specialist at Detroit Metropolitan Wayne County Airport (DTW). The complainant alleged a violation of Federal Aviation Administration (FAA) regulation, as well as on-going aviation safety concerns previously investigated by the Office of Inspector General (OIG). The Secretary delegated investigative responsibility to OIG. We conducted this investigation jointly with FAA's Air Traffic Safety Oversight Service (AOV). **Attachment 1** describes the methodology of our investigation.

Previously, in a letter dated December 19, 2008, OSC referred two complaints (DI-08-2777 and DI-08-3157) to OIG for investigation. Secretary LaHood issued a response dated January 14, 2010, that contained OIG's Report of Investigation dated December 14, 2009. The Department of Transportation Office of General Counsel provided supplemental responses to OSC dated May 21, 2010, and June 25, 2010. Among other things, the December 14 report and May 21 response found that a national order must be violated for a controller to receive an operational error or deviation. The complainant presently contends that between 2007 and November 2010, FAA improperly attributed operational errors and deviations to DTW controllers for violating local orders, while a DTW Front Line Manager was not similarly attributed an operational deviation for violating a local order on July 21, 2008.

Our December 2009 report also provided findings responding to the complainant's allegation that the two main wind speed measuring devices at DTW, the Automated Surface Observing System (ASOS) and Terminal Doppler Weather Radar (TDWR), reported significantly different wind measurements. DTW officials have assigned the ASOS as the facility's primary wind instrument for air traffic control purposes; the Wind Measuring Equipment (WME) serves as the secondary instrument. The TDWR, which is referenced in the complaints as the secondary wind instrument, is primarily responsible for reporting microbursts and wind shears. Although the TDWR-Integrated Terminal Weather System display screen in the DTW Air Traffic Control Tower shows wind speed measurements, the WME, a mechanical anemometer, provides those measurements. Consequently, this report will refer to the secondary wind instrument as the WME.

Although DTW Technical Operations personnel replaced the WME in March 2009, the complainant reported a continued disparity in the wind measurements provided by the ASOS and WME. As stated in the June 2010 supplemental response, FAA advised that, despite the continued discrepancy, the ASOS and WME were operating properly and that FAA would not fund DTW's Needs Assessment Program request attempting to address the discrepancy. The complainant presently alleges the disparate measurements continue and cites a December 6, 2010, report from an FAA Technical Operations Weather Sensors Meteorologist that nearby buildings are affecting the ASOS's measurements.

Additionally, during an OIG investigation conducted pursuant to letters from OSC dated March 12 (DI-08-0591) and May 20, 2008 (DI-08-1696), the complainant alleged DTW's inability to electronically provide aircraft departing to certain Ohio airports with Standard Instrument Departure (SID) information increased the risk to safety. A SID contains flight information, such as headings and waypoints, for departing aircraft. When electronically transmitted using the FAA Pre-Departure Clearance (PDC) system, the SID information is displayed in the aircraft's cockpit. In a May 18, 2009, Report of Investigation, OIG found that the inability of DTW to electronically provide SID information via the PDC system was not unsafe. Nonetheless, OIG reported that DTW personnel were developing a procedure to ensure, among other things, all departing aircraft, including those traveling to the Ohio airports, receive SIDs electronically using the PDC system.

In the present case, the complainant again contends that the lack of SIDs for departures to certain Ohio airports – and the corresponding inability to transmit that departure information using the electronic PDC system – creates a safety risk because the resultant verbal instructions between the tower and pilot could be misunderstood or copied in error by the pilot.

SYNOPSIS

In our opinion, complainant's allegation that FAA officials improperly attributed operational errors and deviations to DTW controllers for violating local orders or directives is unfounded. The evidence indicates the facility issued the operational errors and deviations based on definitions provided in FAA Order 7210.56C, a national order. Additionally, this report clarifies what constitutes an operational deviation when local orders or directives are implicated.

Although the ASOS and WME, at times, continue to provide disparate wind measurements, we were unable to substantiate the allegation that these disparities resulted in an "unsafe and untenable situation for controllers and the flying public."

Finally, we were unable to substantiate the allegation that the lack of SIDs for departures to certain Ohio airports constitutes a substantial and specific threat to public safety. Although the issuance of SIDs and use of the PDC system may increase the safety and efficiency of providing aircraft with departure information, providing such information verbally is not unsafe and remains an approved FAA procedure.

Below are the details of our investigation.

DETAILS:

Allegation 1: Federal Aviation Administration officials improperly attributed operational errors and deviations to air traffic controllers at Detroit Metropolitan Wayne County Airport for violating a local order.

FINDINGS

We found this allegation to be unfounded.

The complainant contends that if a violation of a national order is, as we previously reported, required for an operational error or deviation, on dozens of occasions from 2007 to 2010, FAA officials improperly attributed operational errors and deviations to DTW controllers for violating local order or directives. He noted that in each incident, the FAA Form 7210-3, "Final Operational Error/Deviation Report," used to memorialize operational errors and deviations, indicated the violation of a local order. (*See*, **Attachment 2**, Block 48) Because DTW allegedly attributed operational errors and deviations to controllers for violating local orders, the complainant maintains these events should be reclassified. The DTW Acting Air Traffic Manager, in a September 28, 2010, memorandum, previously denied complainant's request to reclassify as non-events all operational errors and deviations stemming from local orders.

In our December 14, 2009, report, we stated that an operational error or deviation must be a violation of the "national, not local, standard." The "national standard" is FAA Order JO 7110.65, "Air Traffic Control," frequently referred to as the "Controller's Handbook." Paragraph 2-1-14.a. of this Order requires controllers to, "Ensure that the necessary coordination has been accomplished before you allow an aircraft under your control to enter another controller's area of jurisdiction." (**Attachment 3**)

What constitutes "necessary coordination" is generally found in the specific requirements of FAA Order JO 7110.65. In some cases, however, the "necessary coordination" is found in FAA Order 7210.56C, "Air Traffic Quality Assurance." Paragraph 5-1-1.d.(3) of this Order, for example, defines the coordination as "direct coordination or as specified in a [letter of agreement], pre-coordination, or internal procedure" involved in a specific aircraft operation. (**Attachment 4**) Such a letter of agreement exists between the Detroit Air Traffic Control Tower and the Detroit Terminal Radar Approach Control (TRACON) facility, and it imposes requirements on controllers in both facilities. The letter of agreement states that under certain specific conditions, Detroit Tower controllers will assign specific headings to aircraft departing DTW. If a Detroit Tower controller failed to assign the departure heading required by the letter of agreement to an aircraft, and if that aircraft subsequently entered Detroit TRACON jurisdiction without the TRACON controller knowing the heading was not assigned, an operational deviation, as defined by FAA Order 7210.56C, would have occurred.

In his September 28, 2010, memorandum denying complainant's reclassification request, the DTW Acting Air Traffic Manager referenced FAA Order 7210.56C. The memorandum provided definitions for operational errors and operational deviations contained in Paragraph 5-1-1 of the Order and stated that the operational errors and deviations were "[b]ased on these definitions."

The complainant alleges that because the subject Final Operational Error/Deviation Reports identified only the specific requirements – from the Detroit letters of agreement, internal directives, or standard operating procedures orders – as the requirements that were violated, the relevant events should not have resulted in operational deviations. In his OIG interview, complainant acknowledged that all of the specific incidents reported were operational deviations as defined by FAA Order 7210.56C. He said, "There is no doubt in my mind they should be ODs (operational deviations)."

For operational deviations, the overarching national standard may be paragraph 2-1-14 of Order 7110.65; however, little value would be gained by citing this paragraph in Block 48 and elsewhere throughout the report. Instead, by management citing the specific local letter of agreement, directive, or standard operating procedure, the reports can be used to determine operational trends. In other words, although determining that operational safety events involve misapplication or failure to apply paragraph 2-1-14 is useful, it is more beneficial to know that the safety events involve the misapplication or failure to apply the specific requirements found in the facility's letter of agreement, directive, or standard operating procedures. With this knowledge, the facility and FAA can better focus and target appropriate corrective actions.

In summary, the assertion that the reported events were not operational deviations because their associated "Final Operational Error/Deviation Reports" did not specifically reference a national order is false. Accordingly, DTW management officials did not err when they refused complainant's request to reclassify the events.

Complainant additionally alleges that a DTW Front Line Manager received preferential treatment because FAA did not attribute an operational deviation to him for the safety events that occurred on July 21, 2008, and that were the subject of a previous OIG investigation.[1] AOV officials have again reviewed the specifics of these events. Because there is no requirement to coordinate Runway 22L departures with the Detroit TRACON Runway 27L final approach controller, the AOV officials did not find that the manager's actions or inactions met the definition of an operational deviation as defined in 7210.56C. Therefore, since no operational deviation occurred, there is no evidence the Front Line Manager received preferential treatment.

[1] In our December 14, 2009, report, we stated that then-AOV Air Traffic Investigator Scott Proudfoot confirmed that the events of July 21, 2008, did not constitute operational errors or deviations. This conclusion should have been attributed to another AOV official.

Allegation 2: The Automated Surface Observing System and Wind Measuring Equipment in Detroit continue to display significantly different wind measurements, resulting in an "unsafe and untenable situation for controllers and the flying public."

FINDINGS

We were unable to substantiate the allegation that different wind measurements result in "an unsafe and untenable situation for controllers and the flying public."

As stated in our December 14, 2009, report, we substantiated the complainant's allegation regarding the disparate readings of the ASOS and WME and found that this had occurred since at least 2006. The June 25, 2010, supplemental response stated, however, that the then-FAA Air Traffic Organization Office of Safety (ATO-Safety) Vice President of Safety advised that a previously-submitted DTW funding request to modify the ASOS and WME was not approved and no additional funding for the matter would be requested because the devices were operating properly.

Complainant and other controllers at DTW continue to report significantly different wind speed and direction readings from the ASOS and WME. For example, a March 26, 2011, Problem Report from DTW indicated the ASOS recorded winds of 9 knots – gusting to 16 knots – blowing from a direction of 030 degrees, while the WME recorded winds of 7 knots blowing from a direction of 120 degrees. (**Attachment 5**) Under DTW's current air traffic procedures, the measurements from the ASOS would require using a North Flow air traffic operation, while the WME measurements would require a South Flow. Such a discrepancy, and the underlying uncertainty it causes, lie at the heart of complainant's allegation.

In 2010, the Acting Eastern Michigan General National Airspace System Manager asked FAA Technical Operations personnel to examine the ASOS and WME. After conducting a site visit to DTW in October 2010, a Technical Operations Weather Sensors Meteorologist provided the December 6, 2010, report OSC referenced in its February 28, 2011, referral letter. The report found, among other things, that the ASOS wind sensor (anemometer) location violates the ASOS siting standard because five aircraft hangars to the east of the device "are likely causing sheltering." Consequently, the report recommended relocating the ASOS and WME to a mutual location near the southern edge of Runway 4R and mounting the devices on 33-foot poles.

The Meteorologist and his Section Manager, however, have since advised us that the ASOS does, in fact, meet the relevant siting standard, FCM-S4-1994. (**Attachment 6**) Under Chapter 2.5 of the Standard, wind instruments will be mounted between 30 and 33 feet above the average ground height within a 500-foot radius of the instruments. The Chapter further states, however, that, "if practical," the instruments shall be at least

10 feet higher than any obstruction, such as a building, outside the 500-foot radius, but within a 1,000-foot radius of the instruments. According to page 6 of the December 6, 2010, report, the five hangars lie between 561 and 750 feet to the east of the ASOS and range in height from 23 to 52 feet. Because the hangars are located more than 500 feet from the device, and given the use of the term "if practical," the ASOS is not required to be 10 feet above the highest hangar. Therefore, the ASOS meets the siting criteria of FCM-S4-1994.

Nevertheless, the Meteorologist and his Section Manager maintain that although the ASOS meets the siting criteria of FCM-S4-1994, the ASOS is indeed affected by sheltering from the hangars. Consequently, they still recommend that FAA move the ASOS and WME to a mutual location near Runway 4R.

The Meteorologist also informed us that in March 2011, Technical Operations personnel changed the WME's gust algorithm software to more closely match the gust algorithm used by the ASOS. Previously, the WME reported wind gusts only when the gusts reached 9 knots above the average wind speed. Now, the WME mirrors the ASOS by reporting gusts once they reach 5 knots above the average. As before, both devices produce a 2-minute average wind speed. The ASOS and WME, however, continue to, at times, report significantly different measurements, including the direction of the wind.

We witnessed the difference in directional readings from the ASOS and WME during our site visit to DTW. On May 20, 2011, at 3:26 p.m., for example, the ASOS recorded winds of 5 knots at 150 degrees, while the WME recorded winds of 5 knots at 190 degrees. We also observed the proximity of the hangars that are likely causing sheltering of the ASOS and caused the Meteorologist to conclude in his December 6, 2010, report that the ASOS was improperly sited.

Shortly after the December 6, 2010, report was issued, Technical Operations officials in Detroit updated a Needs Assessment Program request to fund the relocation of the ASOS to a site nearer the WME. According to the request, the relocation would move the ASOS from its current site 6,970 feet from the WME to a site approximately 2,000 feet away. Various officials – including FAA personnel from DTW, the Central Service Area, Technical Operations, and FAA Headquarters – have discussed the ASOS-WME discrepancy and the need for funding to address the issue. These discussions included several teleconferences between officials from the National Weather Service – which owns the ASOS – and FAA, including a teleconference on July 19, 2011, in which the complainant participated.

We provided the current FAA ATO-Safety Vice President of Safety with our investigative findings, including the likely sheltering caused by the hangars. We also provided him with the December 6, 2010, report. On August 8, 2011, we met with a Senior Analyst assisting the Vice President of Safety, as well as the FAA Senior Advisor for Technical Operations Safety and Operations Support and the FAA Director of Terminal Operations for the Central Service Area.

After this meeting, ATO-Safety officials undertook an analysis of data from the ASOS and WME. The analysis included a review of facility logs (Form 7230-4), pilot safety reports (Aviation Safety Reporting System), air traffic controller safety reports (Air Traffic Safety Action Program and Air Traffic Quality Assurance) for the months of October 2010 and April 2011. ATO-Safety officials selected October 2010 and April 2011 because these months represent seasonal transition periods when rapid changes in wind direction and speed due to frontal passages and convective extremes were noted. The analysis found only one air traffic event directly related to wind and none that involved a discrepancy between the ASOS and WME. Based upon this analysis, the ATO-Safety officials found that, although the two devices sometimes provide significantly divergent measurements, this discrepancy would rarely affect DTW's selection of air traffic control flow. Consequently, we are unable to conclude that the ASOS and WME discrepancies have resulted in an "unsafe and untenable situation for controllers and the flying public."

Because discrepancies between the ASOS and WME measurements do, at times, occur, FAA officials continue to review the matter and are considering action that would reduce the number of discrepancies and increase air traffic controller confidence in the instruments. For example, in an attempt to address the current distance between the two devices, FAA officials are considering the recommendation to co-locate the ASOS and WME. According to ATO-Safety's Senior Analyst, such co-location, however, may not provide accurate wind measurements for all runway thresholds, particularly during periods of rapidly changing weather.

An alternative under consideration is to designate the WME as DTW's primary wind-measuring device. FAA officials believe this would reduce controller concerns because Technical Operations personnel have inspected the WME and found it to be operating and sited correctly, the WME is more centrally located than the ASOS and is not exposed to possible sheltering, the WME provides six individual wind readings per minute for every one wind reading provided by the ASOS, and all other major airports with multiple wind sensors use the WME as their primary wind-measuring device. DTW is considering a Safety Risk Management analysis panel to study the hazards and safety actions that may result from changing the facility's primary wind sensor from the ASOS to the WME and to devise potentially necessary mitigations.

On August 26, 2011, OIG requested that FAA's Audit and Evaluation Office track FAA action to reduce the number of wind measurement discrepancies and report back to OIG.

Allegation 3: Air Traffic Controllers are unable to electronically issue Standard Instrument Departures to aircraft departing Detroit for several airports in Ohio, resulting in a "substantial and specific danger to public safety."

FINDINGS

We were unable to substantiate this allegation.

As stated in our May 18, 2009, report, a controller at DTW currently provides departure information verbally to pilots travelling to certain Ohio airports who, in turn, manually input the information into their aircraft and read the information back to the controller to confirm accuracy. The affected airports are: Cincinnati/Northern Kentucky International, Cleveland Hopkins International, Port Columbus International, and Toledo Express. Complainant contends that the lack of SIDs for departures to those Ohio airports – and the corresponding inability to transmit that departure information using the electronic PDC system – creates a safety risk because the resultant verbal instructions between the tower and pilot could be misunderstood or copied in error by the pilot. We were unable to conclude from the evidence, however, that verbally providing the departure information constitutes a substantial and specific danger to aviation safety.

During OIG's current investigation, none of the interviewed witnesses, including the complainant, stated that the lack of SIDs and the use of verbal communication of departure information – instead of using PDC – is unsafe. Rather, the witnesses and the complainant stated that the use of SIDs and PDC is safer. This is a significant distinction and is the basis for our finding.

As stated in our previous report, verbally issuing departure information is the approved back-up procedure if the PDC system fails, and controllers verbally provide departure information at airports throughout the country, including DTW, every day. Nevertheless, DTW officials have attempted to address the lack of SIDs for departures to the Ohio airports.

DTW did not adopt the proposal developed by a DTW controller in the summer of 2008 to address the SID issue that we referenced in our May 2009 report. As recently as August 18, 2011, however, the Acting Detroit TRACON Support Manager met with officials from the FAA Operations Support Group within the Central Service Area and FAA Aeronautical Products in Oklahoma City concerning test language amending the wording of the "Fort Wayne Four Departure" SID that could be issued to departures to Cincinnati. The language is currently under review by DTW officials and, if approved, DTW controllers will issue the amended SID to pilots during a test period. If the test proves successful, the proposed SID amendment will be submitted to and reviewed by the Operations Support Group, as well as the Regional Airspace and Procedures Team (RAPT). The RAPT, which is comprised of interested stakeholders within the region, such as officials from other facilities whose airspace would be affected, review changes to published air traffic procedures such as SIDs. If both the Operations Support Group and RAPT agree upon the amended SID, officials from FAA Aeronautical Products will then officially amend the SID, conduct a flight check to ensure the SID does not conflict with existing departure requirements such as ground obstacles, and publish the final procedure.

On August 26, 2011, OIG formally requested that FAA's Audit and Evaluation Office track FAA action on the SID issue and report back to OIG.

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INDEX OF ATTACHMENTS

1. Methodology
2. FAA Form 7210-3, – Block 48, *"Final Operational Error/Deviation Report,"* September 2006
3. FAA Order JO 7110.65 – Paragraph 2-1-14, "*Air Traffic Control*," February 14, 2008.
4. FAA Order 7210.56C – Paragraph 5-1-1, *"Air Traffic Quality Assurance,"* July 20, 2009
5. Problem Report, March 26, 2011
6. FCM-S4-1994, *"Federal Standard for Siting Meteorological Devices at Airports,"* August 1994

ATTACHMENT 1: METHODOLOGY OF INVESTIGATION

This investigation was conducted by the OIG Director of Special Investigations, an OIG Senior Attorney-Investigator, and an OIG Senior Investigator, with technical assistance from an FAA Air Traffic Investigator. To address the whistleblower's concerns, we interviewed and held discussions with numerous individuals, including:

- Vice President of Safety, FAA
- Senior Advisor for Technical Operations Safety and Operations Support, FAA
- Director of Terminal Operations for the Central Service Area, FAA
- Acting Detroit Air Traffic Manager, FAA
- Acting Detroit TRACON Support Manager, FAA
- Detroit Tower Support Manager, FAA
- Five Detroit Air Traffic Control Specialists, FAA
- Acting Eastern Michigan General National Airspace System Manager, FAA
- Technical Operations Section Manager, FAA
- Technical Operations Wind Sensors Meteorologist, FAA

In addition, our investigative team analyzed numerous records and documents obtained from the whistleblower, witnesses, DTW, and FAA including memoranda, emails, and FAA regulations, orders, and notices.

ATTACHMENT 2: FAA FORM 7210-3 – BLOCK 48, *"FINAL OPERATIONAL ERROR/DEVIATION REPORT,"* SEPTEMBER 2006

Final Operational Error/Deviation Report	Report Number	D T W [redacted]

37. Was an OSIC or CIC on duty at the time of the incident?

Enter A for OSIC
Enter C for CIC
A

38. Was the assigned OSIC/CIC present in the operational area at the time of the incident?

[X] Yes [ ] No

39. Did the employee require OSIC/CIC assistance prior to the incident?

[ ] Yes [ ] No

40. Did the assigned OSIC/CIC provide assistance?

[ ] Yes [ ] No

(Explain in Block 65, Summary of Incident.)

41. If sectors were combined, did the OSIC/CIC approve the combination?

[ ] Yes [ ] No [X] Not combined [ ] N/A

42. If the positions were combined, did the OSIC/CIC approve the combination?

[X] Yes [ ] No [ ] Not combined

43. In what activity was the assigned OSIC/CIC engaged at the time of the incident?

[X] General Supervision
[ ] Direct operational supervision
[ ] Working a position of operation
[ ] Administering training
[ ] Receiving training
[ ] Other

44. Was the OSIC/CIC certified in the area of specialization where the incident took place?

[X] Yes [ ] No [ ] N/A (If no, explain here)

45. Traffic complexity? 3

1	2	3	4	5
Low		Avg.		High

46. Indicate which factors were associated with traffic complexity.

[ ] Weather
[ ] Terrain
[ ] Airspace configuration
[X] Number of aircraft
[X] Experience level
[ ] Emergency situation
[ ] Runway configuration
[ ] Runway condition
[ ] Flow control
[ ] Special Event
[ ] Other

47. Type of Control Provided

[ ] Radar
[X] Tower
[ ] Oceanic
[ ] Non-radar
[ ] AFSS/FSS
[ ] TFM

48. Required separation was by:

[ ] FAA Order
[X] Facility Letter of Agreement (LOA) or Directive

FAA Order:
Facility LOA/Directive: D21/DTW

Paragraph:
Paragraph: 9

49. Were any deficient procedures noted as a result of the incident?

[ ] Yes [X] No

(If yes, explain here)

50. Were any special procedures in effect at the time of the incident (e.g. Traffic Management Program)?

[ ] Yes [X] No

(If yes,explain here)

ATTACHMENT 3: FAA ORDER JO 7110.65 – PARAGRAPH 2-1-14, "*AIR TRAFFIC CONTROL*," FEBRUARY 14, 2008

6. Upon break-up of the formation flight, the controller initiating the break-up shall ensure that all aircraft or flights are assigned their proper equipment suffix.

2-1-14. COORDINATE USE OF AIRSPACE

a. Ensure that the necessary coordination has been accomplished before you allow an aircraft under your control to enter another controller's area of jurisdiction.

b. Before you issue control instructions directly or relay through another source to an aircraft which is within another controller's area of jurisdiction that will change that aircraft's heading, route, speed, or altitude, ensure that coordination has been accomplished with each of the controllers listed below whose area of jurisdiction is affected by those instructions unless otherwise specified by a letter of agreement or a facility directive:

1. The controller within whose area of jurisdiction the control instructions will be issued.

2. The controller receiving the transfer of control.

3. Any intervening controller(s) through whose area of jurisdiction the aircraft will pass.

c. If you issue control instructions to an aircraft through a source other than another controller (e.g., ARINC, AFSS/FSS, another pilot) ensure that the necessary coordination has been accomplished with any controllers listed in subparas b1, 2, and 3, whose area of jurisdiction is affected by those instructions unless otherwise specified by a letter of agreement or a facility directive.

REFERENCE-
FAAO JO 7110.65, Para 2-1-15, Control Transfer.
FAAO JO 7110.65, Para 5-5-10, Adjacent Airspace.
FAAO JO 7110.65, Para 5-4-5, Transferring Controller Handoff.
FAAO JO 7110.65, Para 5-4-6, Receiving Controller Handoff.

2-1-15. CONTROL TRANSFER

a. Transfer control of an aircraft in accordance with the following conditions:

1. At a prescribed or coordinated location, time, fix, or altitude; or,

2. At the time a radar handoff and frequency change to the receiving controller have been completed and when authorized by a facility directive or letter of agreement which specifies the type and extent of control that is transferred.

REFERENCE-
FAAO JO 7110.65, Para 2-1-14, Coordinate Use of Airspace.
FAAO JO 7110.65, Para 5-4-5, Transferring Controller Handoff.
FAAO JO 7110.65, Para 5-4-6, Receiving Controller Handoff.

b. Transfer control of an aircraft only after eliminating any potential conflict with other aircraft for which you have separation responsibility.

c. Assume control of an aircraft only after it is in your area of jurisdiction unless specifically coordinated or as specified by letter of agreement or a facility directive.

2-1-16. SURFACE AREAS

a. Coordinate with the appropriate nonapproach control tower on an individual aircraft basis before issuing a clearance which would require flight within a surface area for which the tower has responsibility unless otherwise specified in a letter of agreement.

REFERENCE-
FAAO JO 7210.3, Para 4-3-1, Letters of Agreement.
14 CFR Section 91.127, Operating on or in the Vicinity of an Airport in Class E Airspace.
P/CG Term- Surface Area.

b. Coordinate with the appropriate control tower for transit authorization when you are providing radar traffic advisory service to an aircraft that will enter another facility's airspace.

NOTE-
The pilot is not expected to obtain his/her own authorization through each area when in contact with a radar facility.

c. Transfer communications to the appropriate facility, if required, prior to operation within a surface area for which the tower has responsibility.

REFERENCE-
FAAO JO 7110.65, Para 2-1-17, Radio Communications Transfer.
FAAO JO 7110.65, Para 3-1-11, Surface Area Restrictions.
FAAO JO 7110.65, Para 7-6-1, Application.
14 CFR Section 91.129, Operations in Class D Airspace.

ATTACHMENT 4: FAA ORDER 7210.56C – PARAGRAPH 5-1-1, *"AIR TRAFFIC QUALITY ASSURANCE,"* JULY 20, 2009

CHAPTER 5. AIR TRAFFIC OPERATIONAL ERRORS AND DEVIATIONS, INVESTIGATION AND REPORTING

5-1-1. DEFINITIONS

a. Closest Proximity. The closest proximity is defined as the point at which the combined lateral and vertical separation results in the lowest slant range, regardless of geometry, as determined by the separation conformance calculator. Closest proximity is entered into Block 7 of the Preliminary OE/OD Report (Form 7210-2) and Block 8 of the Final OE/OD Report (Form 7210-3), and the appropriate block of the Proximity Event Report (new), Form 7210-6.

b. Final Report. Refers to FAA Form 7210-3, "Final Operational Error/Deviation Report."

c. No Conformance. Refers to losses of the separation minima that do not qualify for a separation conformance rating; e.g., minimum vectoring altitude (MVA), oceanic, surface, non-radar, and military formation flights.

d. Operational Deviation (OD). An occurrence attributable to an element of the air traffic system which did not result in an Operational Error (OE) as defined in this Notice, but:

(1) Less than the applicable separation minima existed between an aircraft and adjacent airspace without prior approval; or

(2) An aircraft penetrated airspace that was delegated to another position of operation or another facility without prior coordination and approval; or

(3) An aircraft penetrated airspace that was delegated to another position of operation or another facility at an altitude or route contrary to the altitude or route requested and approved in direct coordination or as specified in a letter of agreement (LOA), precoordination, or internal procedure; or

(4) An aircraft is either positioned and/or routed contrary to that which was coordinated individually or; as specified in a LOA/directive between positions of operation in either the same or a different facility; or

NOTE-
This does not apply to inter/intra-facility traffic management initiatives.

(5) An aircraft, vehicle, equipment, or personnel encroached upon a landing area that was delegated to another position of operation without prior coordination and approval.

e. Operational Error (OE). An occurrence attributable to an element of the air traffic system in which:

(1) Less than 90% of the applicable separation minima results between two or more airborne aircraft, or less than the applicable separation minima results between an aircraft and terrain or obstacles (e.g., operations below minimum vectoring altitude (MVA); aircraft/ equipment / personnel on runways), as required by FAA Order 7110.65 or other national directive; or

(2) An aircraft lands or departs on a runway closed to aircraft operations after receiving air traffic authorization, or

(3) An aircraft lands or departs on a runway closed to aircraft operations, at an uncontrolled airport and it was determined that a NOTAM regarding the runway closure was not issued to the pilot as required.

f. Performance. Human conduct including actions (or inactions) leading to, during, and after an OE/PE/OD.

g. Preliminary Report. Refers to FAA Form 7210-2, "Preliminary Operational Error/Deviation Report."

h. Proximity Event. A loss of separation minima between two aircraft where 90 percent or greater separation is maintained in either the horizontal or vertical plane. This does not include any violation of wake turbulence separation minima or losses of separation that are classified under the No Conformance minima.

i. Proximity Event Report. Refers to FAA Form 7210-6, "Proximity Event Report."

j. Regional Operations Center (ROC). One of nine communications center serving the FAA's local Regional offices and the ATO's Service Area and Service Center offices.

k. Remaining hazards. Primary and/or contributing causes of operational errors identified

ATTACHMENT 5: PROBLEM REPORT, MARCH 26, 2011

10/17/10 BD

PROBLEM REPORT

DATE: 3/26/11 TIME (Z): 21:18:24 INITIALS: MB POSITION: LNW

* STARS EFSTS ETVS ASDE-X FREQ SSCS ROUTING (OTHER)
(circle appropriate problem/s) (similar call signs)

DUPLICATE FLIGHT PLANS – Provide flight progress strips if able.

STARS CONFIG: FIXED PAIRS (multi func. D, slew & enter)

ACID: COMBINED Y / N WITH

EFSTS CONFIG:

	* TRAN		* RECV		TYPE AC
FREQ: ________	MAIN	STBY	MAIN	STBY	LOCATION

PROBLEM:

TDWR WINDS "03009G16"

ASOS WINDS "120/07"

The problem is one of them ain't right, and one or both should be turned off. Reference point → 7210.3 2-10-1

ATTACH FLIGHT STRIP HERE WHEN APPLICABLE
(STARS – EFSTS – SSCS – ROUTING must be accompanied with a flight strip)

Duplicate Flight Plans – FLMs fax to airline ASAP and then forward form to front office.
DELTA: 404 715-1527, COMAIR: 859 767-2081, PINNACLE: 901 348-4375, MESABA: 651 367-5388
COMPASS: 612 713-6829 (Please circle airline to whom you faxed)

CONTROLLERS - FORWARD TO FLM/CIC.

Mandatory Information – Date, Time, Initials

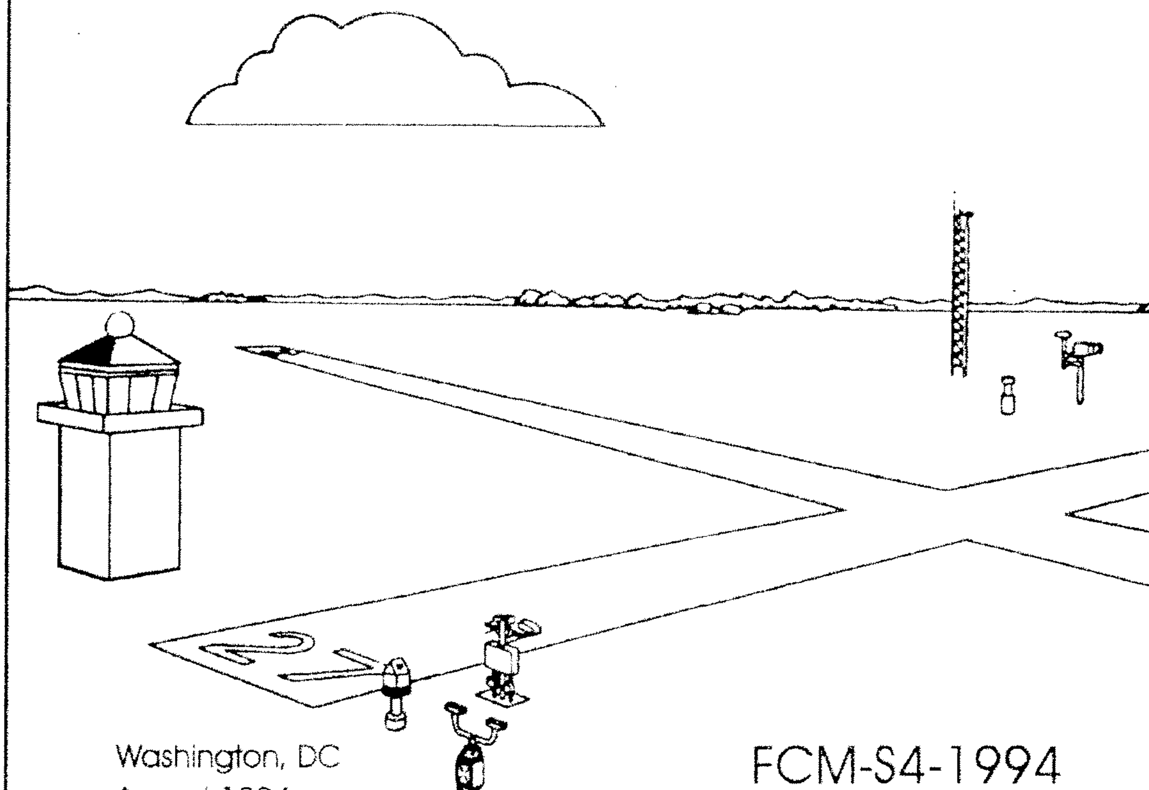
ATTACHMENT 6: FCM-S4-1994, *"FEDERAL STANDARD FOR SITING METEOROLOGICAL DEVICES AT AIRPORTS,"* AUGUST 1994

U.S. DEPARTMENT OF COMMERCE/ National Oceanic and Atmospheric Administration

OFCM

OFFICE OF THE FEDERAL COORDINATOR FOR
METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

Federal Standard for Siting Meteorological Sensors at Airports



Washington, DC
August 1994

FCM-S4-1994

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FEDERAL COORDINATOR
FOR
METEOROLOGICAL SERVICES AND
SUPPORTING RESEARCH

6010 EXECUTIVE BLVD., SUITE 900
ROCKVILLE, MARYLAND 20852

FEDERAL STANDARD FOR SITING

METEOROLOGICAL SENSORS AT AIRPORTS

FCM-S4-1994
Washington, D.C.
August 1994

CHANGE AND REVIEW LOG

Use this page to record changes and notices of reviews.

Change Number	Page Numbers	Date Posted	Initial
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Changes are indicated by a vertical line in the margin next to the change.

Review Date	Comments	Initial

FOREWORD

The coordination of weather observing activities in the United States is complex. In addition to the Departments of Commerce (DOC), Defense (DOD), and Transportation (DOT), this effort requires the participation of commercial aviation interests who represent a large segment of the users of meteorological information.

This diversity mandates that the meteorological information distributed among Federal agencies and commercial users comply to established standards.

The Office of the Federal Coordinator for Meteorology (OFCM) through the Working Group for Surface Observations' Task Group for Surface Instrumentation Standards (TG/SIS) has developed standards for siting automated weather observing systems used at airports and heliports. This document addresses siting characteristics for exposure and placement of sensors. Siting characteristics are essential for the establishment of a standardized meteorological data network and necessary for aviation and other weather forecasting purposes.

While these siting standards define and establish specifications and guidelines, they contain sufficient flexibility for agencies to achieve the requirements through agency specific procedures.

To provide for an orderly transition to metric units, this document includes both English and metric dimensions. Until there is an official conversion to the metric system, English units will prevail.

Julian M. Wright, Jr.
Federal Coordinator for Meteorological
Services and Supporting Research

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CHAPTER 1

INTRODUCTION

1.1 PURPOSE.

This document establishes the Federal standard for siting meteorological sensors of automated weather observing systems at airports/heliports to collect meteorological data in support of aircraft operations as well as aviation and other weather forecasting. It will be used by Federal agencies as a basis for developing and implementing specific regulatory or technical documents. The standard applies to all Federally-owned and Federally-funded systems, as well as non-Federal systems that are to be approved by the Department of Transportation's (DOT) Federal Aviation Administration (FAA) or the Department of Commerce's (DOC) National Weather Service (NWS). Multiple users of meteorological data exist, and to the greatest practical extent, they have been considered in the development of this standard.

In Chapter 2, the standard provides criteria for proper and representative exposure of sensors to assure that data are meteorologically sound. Chapter 3 provides criteria for selecting locations for sensors at airports; Chapter 4 addresses heliport installations.

1.2 SCOPE.

This standard is intended to serve as the most fundamental reference for sensor siting. While this document is not of itself regulatory in nature, it is to be implemented through appropriate agency orders. Likewise, this standard may be modified or enhanced by agency directives. This document does not require agencies to change existing sensor installations solely to comply with this standard. It will be applied as new stations are established. The inclusion and description of a particular sensor in this document does not imply that such sensors will be used in all system applications.

In applying this document to the planning of an automated weather observing system site at an airport with a control tower, no site shall be finalized without consulting with representatives of both NWS and FAA.

Sensor siting in accordance with this standard meets the requirements of Section 77.15(c) of the Federal Aviation Regulations (FAR) and is exempt from further Part 77 study. Any exceptions to the standard or special situations will require an FAA Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) study in accordance with Part 77 of the FAR to determine if a substantial adverse effect would be created for aircraft operations.

The standard covers the following weather elements:

- Surface wind speed and direction
- Ambient air temperature
- Dew point temperature
- Atmospheric pressure
- Visibility
- Sky condition
- Precipitation type discrimination (rain, snow, drizzle, etc.)
- Precipitation occurrence (Yes/No)
- Freezing precipitation detection
- Precipitation accumulation
- Snowfall-snow depth
- Lightning detection

The standard does not address:

- Details of installation for individual manufacturers' sensors
- Shielding and/or venting of sensors, except in general terms
- Special application systems such as those designed to detect low-level wind shear
- Details of lightning protection

CHAPTER 2

SENSOR EXPOSURE

2.1 GENERAL.

Sensor siting shall not violate runway or taxiway object free areas, runway or taxiway safety areas, obstacle free zones, or instrument flight procedures surfaces as defined in FAA Advisory Circular (AC) 150/5300-13, Airport Design, or FAA Handbook 8260.3, TERPS. Notwithstanding these constraints, the sensor exposure will strive to minimize or eliminate the effects of manmade or geographical obstructions. The tower used to mount the wind sensor is not considered an obstruction to the sensor collection system, but it will (with the exception of the temperature, dew point, and pressure sensors) be at least 10 feet (3 meters) away from the other sensors. Sensors should be located as far as practicable from cultivated land to reduce contamination by dust and dirt. It may be necessary to increase the heights of some sensors based on the average maximum snow depth for the location, which will be determined by averaging the maximum annual snow depths over the period of record.

2.2 PRESSURE SENSOR.

The pressure sensor will be installed on the airfield, usually in a weatherproof facility (building, shelter, enclosure, etc.). When the pressure sensor is vented to the outside, a vent header will be used. In most cases, internal venting of the pressure sensors may be satisfactory. However, if it is determined that internal venting will affect the altimeter setting value by $\pm$ 0.02 inches of mercury or more, outside venting will be used. A portable transfer standard will be used to resolve any questions regarding the need for external venting. Siting that will cause pressure variations due to air flow over the venting interface should be avoided. The venting interface will be designed to avoid and dampen pressure variations and oscillations due to "pumping" or "breathing" of the pressure sensor venting and porting equipment. Each sensor will have an independent venting interface from separate outside vents (if outside venting is required) through dedicated piping to the sensors. The sensors should also be located in an area free of jarring, vibration, and rapid temperature fluctuations (i.e., avoid locations exposed to direct sunlight, drafts from open windows, and air currents from heating or cooling systems). If the pressure sensors are sited outdoors, the height of the vent header shall not be less than one foot above the average maximum snow depth, or 3 feet (1 meter) above ground level, whichever is higher.

Pressure sensor derived values are of critical importance to aviation safety and operations. Great care shall be taken to ensure that pressure sensor siting is suitable and accurate. The field and sensor elevations above Mean Sea Level (MSL) elevation shall be determined to the nearest whole foot in accordance with agency procedures. The distance between the elevation of the pressure sensors and the field elevation will not exceed 100 feet (30 meters).

The above criteria are applicable to altimeter-only systems, except: (1) the pressure sensor will be installed within 6 miles (9.6 kilometers) of the instrument runway threshold, (2) a temperature correction is used in the algorithm to compute altimeter setting, and (3) the elevation difference between the height of the pressure sensors and the field elevation may be increased to 500 feet (150 meters).

2.3 CLOUD HEIGHT SENSOR.

The cloud height sensor will be mounted on a platform/pedestal with the sensor optics a minimum of 4 feet (1.2 meters) above ground level or above maximum snow depth, whichever is higher. The sensor should be located as far as practicable from strobe lights and other modulated light sources.

2.4 VISIBILITY SENSOR.

The visibility sensor will be mounted on a platform/pedestal as free as possible from jarring and vibration. Unless otherwise specified by the manufacturer, the receiver will be pointed in a northerly direction. The sensor should be located as far as practicable from strobe lights and other modulated light sources. It should neither be located in an area that is subject to localized obstructions to vision (e.g., smoke, fog, etc.) nor in an area that is usually free of obstructions to vision when they are present in the surrounding area. It will be mounted so the optics are 10 $\pm$ 2 feet (3 $\pm$ 0.6 meters) above ground or 6 feet (2 meters) above the average maximum snow depth, whichever is higher. Ten feet (3 meters) above the ground is the preferred height. The area within 6 feet (2 meters) of the sensor should be free of all vegetation and well-drained. Any grass or vegetation within 100 feet (30 meters) of the sensor should be clipped to a height of about 10 inches (25 centimeters). These precautions are necessary to reduce the probability of carbon-based aerosols (e.g., terpenes) and insects from interfering with sensor performance. In addition, backscatter-type sensors must have a clear area for 300 feet (90 meters) in the forward (north) octant. Some sensors may require additional clear areas. The clear line of sight requirement for the sensor optics will be as specified by the sensor manufacturer.

2.5 WIND SENSOR.

The wind sensors (wind direction and wind speed) will be oriented with respect to true north. The system software will be used to make required adjustments to magnetic north. The site should be relatively level, but small gradual slopes are acceptable. It will be mounted 30 to 33 feet (9 to 10 meters) above the average ground height within a radius of 500 feet (150 meters). The sensor height shall not exceed 33 feet (10 meters) except as necessary to: (a) be at least 15 feet (4.5 meters) above the height of any obstruction (e.g., vegetation, buildings, etc.) within a 500 foot (150 meters) radius, and (b), if practical, be at least 10 feet (3 meters) higher than the height of any obstruction outside the 500 foot (150 meter) radius, but within a 1,000 foot (300 meter) radius of the wind sensor. An object is considered to be an obstruction if the included lateral angle from the sensor to the ends of the object is 10 degrees or more.

<u>Exception</u>: The height of a wind sensor installed on the Instrument Landing System (ILS) glide slope antenna tower or on a separate tower in area "A", Figure 1 will be reduced, as necessary, such that the height of the complete wind sensor installation (i.e., to include any required air terminal(s) and obstruction lights) does not exceed the height of the glide slope antenna installation. The minimum acceptable height for the wind sensor in this situation is 20 feet (6 meters). If side mounting (i.e., perpendicular to a tower) is necessary, a boom will be used to permit installation of the sensor at a minimum of 3 feet (1 meter) laterally from the tower. Side mounting is to be utilized only if top mounting is not practicable and the tower is of open design to allow for free air flow.

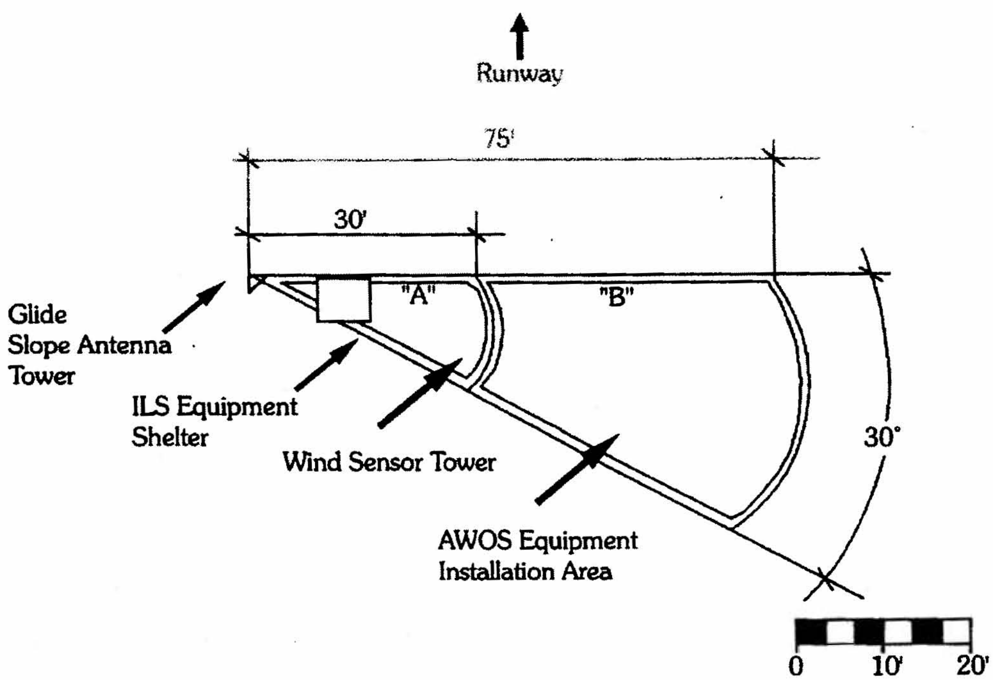

Figure 1. Precision Instrument Runway Siting

2.6 TEMPERATURE AND DEW POINT SENSORS.

The temperature and dew point sensors will be mounted so that the aspirator intake is 5 $\pm$ 1 feet (1.5 $\pm$ 0.3 meters) above ground level or 2 feet (0.6 meters) above the average maximum snow depth, whichever is higher. Five feet (1.5 meters) above ground is the preferred height. The sensors will be protected from radiation from the sun, sky, earth, and any other surrounding objects but at the same time be adequately ventilated. The sensors will be installed in such a position as to ensure that measurements are representative of the free air circulating in the locality and not influenced by artificial conditions, such as large buildings, cooling towers, and expanses of concrete and tarmac. Any grass and vegetation within 100 feet (30 meters) of the sensor should be clipped to height of about 10 inches (25 centimeters) or less.

2.7 LIGHTNING DETECTION (THUNDERSTORM) SENSOR.

The lightning detection (thunderstorm) sensor will be sited and mounted in accordance with the manufacturer's recommendations/specifications. For a single station sensor, metal obstructions will be no closer than two times their height above the sensor.

2.8 PRECIPITATION TYPE DISCRIMINATION SENSOR.

The precipitation type discrimination sensor detects precipitation and discriminates type (e.g., rain, snow). It will be mounted so that the optics are 10 $\pm$ 2 feet (3 $\pm$ 0.6 meters) above ground or 6 feet (2 meters) above the average maximum snow depth, whichever is higher. Ten feet (3 meters) above ground is the preferred height. If the system is double ended, the optical axis will be oriented generally north-south with the receiver facing north. The terrain between the receiver and transmitter should be relatively flat.

2.9 PRECIPITATION OCCURRENCE (YES/NO) SENSOR.

The precipitation occurrence sensor will be mounted in accordance with the manufacturer's specifications at a convenient height but not less than 6 feet (2 meters) above ground level or 4 feet (1.2 meters) above the average maximum snow depth, whichever is higher. Care must be taken to avoid shielding of the sensor by structures, buildings, and other obstacles.

2.10 FREEZING RAIN DETECTION SENSOR.

The siting requirements for the freezing rain sensor are the same as for the precipitation occurrence sensor.

2.11 PRECIPITATION ACCUMULATION (LIQUID OR LIQUID EQUIVALENT) SENSOR.

The precipitation accumulation sensor will be mounted so that the orifice is horizontal and in an area where the terrain is relatively flat. The orifice is defined as the upper rim edge of the collector mouth. The height of the orifice will be as close to ground level as practicable. In determining the height of the orifice, consideration will be given to keeping the orifice above accumulated/drifting snow and minimizing the potential for splashing into the orifice. Surrounding objects will be no closer to the sensor than a distance equal to two times their height above the gage orifice. An object is considered an obstruction if the included lateral angle from the sensor to the ends of the object is 10 degrees or more. In order to reduce losses due to wind, an alter-type windshield is recommended to be installed on gages in areas where 20 percent or more of the annual average precipitation falls as snow. The surrounding ground can be covered with short grass or be of gravel composition, but a hard flat surface, such as concrete, gives rise to splashing and should be avoided. Separate sensors may be used to measure liquid and frozen precipitation accumulation (e.g., rain and snow) in which case the above criteria will be followed for each installation.

2.12 SNOWFALL-SNOW DEPTH SENSOR.

The snowfall-snow depth sensor will be mounted at least 15 feet (4.5 meters) away from the wind tower over an area which would be expected to have snow cover and is representative of the area of interest. It will be mounted in accordance with manufacturer's specifications and recommendations.

2.13 COMBINATION VISIBILITY, PRECIPITATION OCCURRENCE, AND PRECIPITATION ACCUMULATION SENSOR.

The siting requirements for the visibility sensor apply to this combination sensor or any other combinations of the precipitation parameters and visibility.

CHAPTER 3

SITING CRITERIA FOR SENSOR PLACEMENT AT AIRPORTS

3.1 GENERAL.

This Chapter provides criteria for placement of sensors at airports based upon runway category (i.e., visual/nonprecision, precision without Runway Visual Range (RVR) instrumentation, and precision with RVR instrumentation). Special care is necessary in selecting appropriate locations for installation of sensors to assure that the resultant observations are representative of the meteorological conditions affecting aviation operations. Users, in applying these criteria, should consider future plans for the airport that could impact placement of sensors, e.g., installation of an Instrument Landing System (ILS), Microwave Landing System (MLS), runway construction, etc.

The site chosen for locating backup sensors shall be within 11,000 feet (3.4 kilometers) of the primary sensor array and shall have exposure and terrain equivalent to the primary sensor array site.

3.2 CLOUD HEIGHT, VISIBILITY, WIND, TEMPERATURE, DEW POINT, AND PRECIPITATION SENSORS.

3.2.1 General. No sensor siting shall violate runway or taxiway object free areas, runway or taxiway safety areas, obstacle free zones, or instrument flight procedures surfaces as described in AC 150/5300-13, Airport Design, or FAA Handbook 8260.3, TERPS. These sensors (cloud height, visibility, wind, temperature, dew point, and precipitation) should be located together near available power and communications. However, the temperature, dew point, and precipitation sensors can be placed at any convenient location on the airport that meets the sensor exposure criteria outlined in Chapter 2. FAA Sector Manager approval is required for the use of any FAA facilities, such as power, communications, shelters, towers, etc.

3.2.2 Airports with Only Visual and/or Nonprecision Runways. The preferred siting of the cloud height, visibility, and wind sensors and associated data collection platform (DCP) is adjacent to the primary runway 1,000 feet (300 meters) to 3,000 feet (900 meters) down the runway from the threshold. The primary runway is considered to be the runway with the lowest minimums. The minimum distance from the runway centerline shall be 500 feet (150 meters); the maximum distance shall not exceed 1,000 feet (300 meters). The minimum distance of 500 feet (150 meters) assumes flat terrain. If the elevation of the wind sensor site is above or below the runway elevation, then the minimum distance is adjusted by 7 feet (2.1 meters) for every foot (0.3 meters) of elevation difference. The adjustment is negative (i.e., the minimum distance is less than 500 feet [150 meters]) if the sensor site elevation is less than the runway elevation. The adjustment is positive (i.e., the minimum distance is greater than 500 feet [150 meters]) if the sensor site elevation is greater than the runway elevation.

The preferred siting should be appropriate for most airports with only visual and/or nonprecision runways. If this siting proves to be unnecessarily restrictive, the cloud height, visibility, and wind sensors and associated DCP may be sited at an alternate location on the airport provided the alternate location: (1) will assure that the resultant observations are representative of the touchdown zone of the primary runway, and (2) meets the sensor exposure criteria outlined in Chapter 2. In no case shall the site selected result in a violation of a runway or taxiway object free area, runway or taxiway safety area, obstacle free zone or instrument flight procedures surfaces described in AC 150/5300-13, Airport Design, or FAA Handbook 8260.3, TERPS.

3.2.3 Airports with Precision Instrument Runways and Without RVR Instrumentation. There are two preferred options for siting at these airports.

3.2.3.1 Option #1.

The cloud height, visibility, and wind sensors and associated DCP shall be located adjacent to the primary instrument runway 1,000 feet (300 meters) to 3,000 feet (900 meters) down the runway from the threshold. The minimum distance from the runway centerline shall be 750 feet (230 meters); the maximum distance shall not exceed 1,000 feet (300 meters). The minimum distance of 750 feet (230 meters) assumes flat terrain. If the elevation of the wind sensor site is above or below the runway elevation, the minimum distance is adjusted by 7 feet (2.1 meters) for every foot (0.3 meters) of elevation difference. The adjustment is negative (i.e., the minimum distance is less than 700 feet [213 meters]) if the sensor site elevation is less than the runway elevation. The adjustment is positive (i.e., the minimum distance is greater than 750 feet [230 meters]) if the sensor site elevation is greater than the runway elevation. In no case shall the site result in a violation of a runway or taxiway object free area, runway or taxiway safety area, obstacle free zone, or instrument flight procedures surfaces as described in AC 150/5300-13, Airport Design, or FAA Handbook 8260.3, TERPS.

3.2.3.2 Option #2.

The cloud height and visibility sensors and associated DCP shall be located behind the glide slope shelter/MLS elevation station used for the primary precision instrument runway (area "B", Figure 1).

The wind sensor shall be located either on the glide slop antenna tower or on a separate tower. The preferred location is on the glide slope antenna tower as this eliminates the potential safety concerns caused by a separate wind sensor tower. This option shall be implemented at airports that have FAA Airway Facilities technicians available and who will not be relocated as a result of remote maintenance monitoring. Under no conditions shall anyone have access to an FAA glide slope antenna tower without an FAA technician being present.

When mounted on the glide slope antenna tower, the wind sensor shall: (1) not extend above the top of the tower, (2) be mounted on a boom a minimum of 3 feet (1 meter) laterally from the tower, (3) be a minimum of 3 feet (1 meter) vertically from any antenna, and (4) be mounted on the side of the tower opposite from the glide slope antenna face.

If joint use of the glide slope antenna tower is not practical, a separate wind sensor tower shall be installed immediately behind the glide slope antenna tower (area "A", Figure 1). The height of the complete installation (i.e., tower plus air terminal(s) and obstruction lights) shall not exceed the height of the glide slope antenna tower when installed in this area.

Exceptions: Sensors shall not be sited in area "A" or "B", Figure 1, if the glide slope installation is in violation of a runway or taxiway object free zone, runway or taxiway safety area, obstacle free zone, or instrument flight procedures surfaces as defined in AC 150/5300-13, Airport Design, or FAA Handbook 8260.3, TERPS. An OE/AAA study shall be performed if the glide slope installation is decommissioned or relocated subsequent to the siting of the sensors in areas "A" and "B", Figure 1.

One of the above options should be appropriate for most airports with precision instrument runways and without RVR instrumentation. If both options prove to be unnecessarily restrictive, then the cloud height, visibility, and wind sensors and associated DCP may be sited at an alternate location on the airport provided the alternate location: (1) will assure that the resultant observations are representative of the touchdown zone of the primary instrument runway and (2) meets the sensor exposure criteria outlined in Chapter 2. In no case shall the site selected result in a violation of a runway or taxiway object free area, runway or taxiway safety area, obstacle free zone, or instrument flight procedures surfaces as described in AC 150/5300-13, Airport Design, or FAA Handbook 8260.3, TERPS.

3.2.4 Airports with Precision Instrument Runways and With RVR Instrumentation.

The cloud height, visibility, and wind sensors and associated DCP shall be sited at a location on the airport that will assure the resultant observations are representative of the meteorological conditions affecting aviation operations, and that meets the sensor exposure criteria outlined in Chapter 2. No sensor siting shall violate runway or taxiway object free areas, runway or taxiway safety areas, obstacle free zones, or instrument flight procedures surfaces as described in AC 150/5300-13, Airport Design, or FAA Handbook 8260.3, TERPS.

3.3 PRESSURE, LIGHTNING DETECTION SENSORS.

3.3.1 Pressure. The pressure sensors are not functionally constrained to be at any specific location and may be located anywhere that meets the exposure requirements in paragraphs 2.2 and 2.2.1.

3.3.2 Lightning Detection (Thunderstorm). The single station detection sensor shall be installed at any convenient location on the airport and in accordance with requirements described in paragraph 3.3.2.

CHAPTER 4

HELIPORT SITING CRITERIA

4.1 NON-AIRPORT HELIPORT SITING CRITERIA.

Installation of automated weather observing systems at non-airport, heliport locations shall place the sensors in the vicinity of the takeoff and landing area, and where helicopter operations will not induce transient sensor performance (e.g., rotor downwash and blowing dust causing spurious wind and visibility observations). However, no installation shall penetrate the approach and departure surfaces defined in FAA Handbook 8260.3, TERPS, or the surfaces defined in AC 150/5390-2, Heliport Design. In choosing a location, consideration will be given to both Visual Flight Rules and Instrument Flight Rules approach and departure paths and hover/taxi operations. Testing has shown no significant effect on sensors located as close as 100 feet (30 meters) from a medium weight helicopter. Another prime concern is the need to locate the sensors so as to avoid, to the maximum extent possible, conditions (sheltering and other local influences) which may result in non-representative weather observations. This may be a particular problem for heliports located in urban areas and on rooftops. The sensors, except the pressure sensors, should be located no more than 700 feet (213 meters) from the edge of the takeoff and landing area. The pressure sensor is not constrained to be at any specific location on the heliport, except to be free of rotor-induced or other pressure variations. The other sensors should be clustered for ease of installation and maintenance, but problems with non-representative sensor data or other factors may necessitate a separated location of a sensor(s).

Specific criteria for the siting of individual sensors follows (siting at airports refers to Chapter 2):

4.2 PRESSURE SENSORS.

Same as for siting at airports, except the height above or below MSL shall be determined for the heliport takeoff and landing area.

4.3 SENSORS IN VICINITY OF TAKEOFF AND LANDING AREA.

Cloud height, visibility, wind, temperature/dew point, precipitation, lightning detection (thunderstorm) sensors shall be sited as indicated in paragraphs 4.3.1 through 4.3.6.

4.3.1 Cloud Height Sensor.

The cloud height sensor location is the same as for siting at airports, except the height is with respect to the heliport takeoff and landing area.

4.3.2 Visibility Sensor.

The visibility sensor location is the same as for siting at airports, except the height is with respect to the takeoff and landing area. To reduce the influence of dust due to rotorwash on the reported visibility, the visibility sensor should not be sited in a location which is downwind (considering the prevailing wind direction) from the takeoff and landing area.

4.3.3 Wind Sensor.

The wind sensor will be oriented with respect to true north. The system software will be used to make required adjustments to magnetic north. The sensor will be mounted 20-33 feet (6-10 meters) above the heliport takeoff and landing area. If side mounting on a tower is necessary, a boom will be used to permit installation of the sensor a minimum of 3 feet (1 meter) laterally from the tower. Side mounting is to be utilized only if top mounting is not practicable and the tower is of open design to allow for free air flow.

4.3.3.1 Wind Sensor at Ground Level Heliports.

The wind sensor should be located to the side of the preferred approach and departure track should be away from the sheltering influence of buildings or large trees.

4.3.3.2 Wind Sensor at Rooftop Heliports.

The wind sensor on a building or other elevated structure should be located at least 20 feet (6 meters) above the highest structure to minimize the Bernoulli effect. Rooftop size may require siting of the wind sensor elsewhere to preclude penetration of an obstacle identification surface(s). In these situations, siting on an adjacent building may be a viable or even preferred option. It should be noted that many buildings are constructed to the maximum height that would not constitute a hazard to air navigation. Therefore, the above described siting may not be acceptable from an obstruction evaluation standpoint. In these cases, alternatives such as siting on an adjacent building may be necessary.

4.3.4 Temperature and Dew Point Sensors.

The temperature and dew point sensor location is the same as for siting at airports, except the height is with respect to the heliport takeoff and landing area.

4.3.5 Precipitation Sensor(s).

The precipitation sensor location is the same as for siting at airports, except the height is with respect to the heliport takeoff and landing area.

4.3.6 <u>Lightning Detection (Thunderstorm) Sensor</u>.

The lightning detection (thunderstorm) sensor location is the same as for siting at airports.

4.4 <u>AIRPORT HELIPORT SITING CRITERIA</u>.

When an automated weather observing system is to be sited at an airport which has, or is planned to include a heliport, a site should be chosen which will provide service to both runway and heliport users. The following options, in priority order, will be considered under such circumstances:

4.4.1 <u>Option #1</u>.

If siting in accordance with the applicable airport siting criteria (Chapter 3) would also comply with the criteria of paragraph 4.1, the system will be sited in accordance with the applicable airport siting criteria.

4.4.2 <u>Option #2</u>.

If siting in compliance with Option 1 is not appropriate, consideration will be given to an alternate location if such a location would enhance the representativeness of the data at the heliport without degrading the representativeness of the data at the primary airport runway. If such an alternate site is selected, a deviation will be processed in accordance with the directives of the responsible agency.

4.4.3 <u>Option #3</u>.

If siting in compliance with Option 1 or 2 is not possible, the system will be sited in accordance with Chapter 3, or paragraph 4.1, taking into consideration such factors as volume of fixed-wing versus helicopter traffic. If siting in conformance with paragraph 4.1 is more appropriate, a deviation to use the non-airport siting will be processed in accordance with the directives of the responsible agency.

APPENDIX A

ACRONYMS

AC	Advisory Circular
AWOS	Automated Weather Observing System
DCP	Data Collection Package
DOC	Department of Commerce
DOD	Department of Defense
DOT	Department of Transportation
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
ILS	Instrument Landing System
MLS	Microwave Landing System
MSL	Mean Sea Level
NWS	National Weather Service
OE/AAA	Obstruction Evaluation/Airport Airspace Analysis
OFCM	Office of the Federal Coordinator for Meteorological Services and Supporting Research
TERPS	Terminal Instrument Approved Procedures

Federal Aviation Administration

Memorandum

Date:	SEP 9 2011
To:	Robert Westbrooks, Deputy Assistant Inspector General for Investigations
From:	J. Randolph Babbitt, Administrator
Prepared by:	H. Clayton Foushee, Director, Office of Audit & Evaluation, x79440
Subject:	Response to Office of the Inspector General (OIG) Investigation Case No. # I11A001SINV at Detroit Metropolitan Wayne County Airport (DTW) ref: your report dated August 26 2011

This memo responds to your Report of Investigation regarding Detroit Wayne County Metropolitan Airport (DTW) dated August 26, 2011. Our response complements the information submitted by the Director, Office of Audit & Evaluation, on August 18, 2011, in response to your investigator's questions.

Allegation 1:

"Federal Aviation Administration officials improperly attributed operational errors and deviations to air traffic controllers at Detroit Metropolitan Wayne County Airport for violating a local order."

Your investigation determined this allegation to be unfounded.

Allegation 2:

"The Automated Surface Observing System and Wind Measuring Equipment in Detroit continue to display significantly different wind measurements, resulting in an "unsafe and untenable situation for controllers and the flying public."

Response: Although you were unable to substantiate the allegation that different wind measurements result in "an unsafe and untenable situation for controllers and the flying public," we recognize the differences have not been adequately explained to the employees that depend on these two systems to provide information to pilots, and to make decisions regarding the proper runway configurations.

DTW has expressed a desire to select the center-field wind measuring equipment as the primary wind source (making the Automated Surface Observing System (ASOS) a secondary wind source). Safety risk analysis is underway to determine if any hazards need to be addressed as part of this change. As the air traffic policy governing services at each airport permits selection of the wind measuring system, this change will bring DTW into alignment with most every other large airport in the National Airspace System.

Since changing the primary wind measuring system does not eliminate any differences between the two systems, we plan to collect data around the time that different wind readings are noticed. With data from both systems just before and just after each recorded difference, we are seeking a pattern or trend that will help isolate any technical reason for the differences. We hope to eliminate random differences and explain the documented wind readings to raise confidence in our systems essential to air traffic services. The Federal Aviation Administration (FAA) continues a cooperative relationship with the National Weather Service (NWS) and will share all findings and issues with the NWS since they manage the ASOS.

Allegation 3:

> *"Air Traffic Controllers are unable to electronically issue Standard Instrument Departures to aircraft departing Detroit for several airports in Ohio, resulting in a "substantial and specific danger to public safety."*

Response: Although you were unable to substantiate this allegation, we feel that there are both safety and efficiency benefits to publishing standard instrument departures (SID) to airport locations that are frequent destinations. Our airspace and procedures specialists are just beginning the steps necessary to implement changes. It will take several months to complete the processes covered by our existing policy, FAA Order 8260.43, "Flight Procedures Management Program," and to bring about a published change in a SID that has been flight-checked.

We agree with your conclusion that neither the SIDs to Ohio airports or wind sensor readings constitute a substantial or specific danger to public safety, but we are committed to the actions described here to improve the timely release of aircraft from DTW and raising the confidence of controllers that depend on our wind systems necessary to improve safety and efficiency. We will provide quarterly updates to your office until all of the above actions are completed, beginning with our next update in December 2011.

If additional information is needed, please contact Mr. Clay Foushee, Director, Office of Audit & Evaluation, at (202) 267-9440.

Attachment
AAE memo to OIG dated August 18, 2011

cc: Chief Operating Officer (AJO)
Vice President, ATO Safety (AJS)
Vice President, ATO Terminal Services (AJT)