National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation Report

Weather Information Dissemination

Accident Numbers:	CEN15FA044 and CEN15LA137
Operators:	Private pilots
Aircraft and Registration:	Mooney M20K (N231JF); Beechcraft A36 (N29AC)
Locations:	Clines Corners, New Mexico; Andrews, Texas
Dates:	November 12, 2014; February 5, 2015
Adopted:	October 27, 2016

The National Transportation Safety Board (NTSB) is providing the following information to urge the Federal Aviation Administration (FAA) to take action on the safety recommendations in this report. These recommendations address weather information dissemination and are derived from recent accident investigations, which revealed that some critical weather information is not being made available to air traffic controllers and, ultimately, to airborne pilots in need of timely, accurate weather information. Further, when weather information is not readily available to air traffic controllers, many air traffic controllers and their supervisors are unfamiliar with how to solicit alternate sources of weather information. As a result of these investigations, the NTSB is issuing four recommendations to the FAA.

Accidents

Clines Corners, New Mexico

On November 12, 2014, about 1735 mountain standard time (MST), a Mooney M20K, N231JF, collided with terrain in Clines Corners, New Mexico. The pilot died, and the airplane was destroyed by impact forces and a postimpact fire. The airplane was registered to KI Aircraft LLC and operated by the private pilot as a 14 *Code of Federal Regulations* (*CFR*) Part 91 personal flight; no flight plan was filed. Visual meteorological conditions (VMC) with localized instrument meteorological conditions prevailed for the flight, which originated from

Note: This report was reissued on April 13, 2017, with corrections to page 10.

Rick Husband Amarillo International Airport, Amarillo, Texas, about 1616 MST and was destined for Phoenix Sky Harbor International Airport, Phoenix, Arizona.[1]

About 1703 MST, the pilot checked in with the air route traffic control center (ARTCC) at Albuquerque (ZAB). About 1716 MST, the pilot reported that the airplane was starting to collect ice and asked for the altitude for cloud tops. The controller advised that he had no cloud tops reports; the pilot then responded that he needed to "turn around to go back down." The controller asked the pilot if he was interested in intermediate airports along the route of flight where he could land to wait for improved weather. About 1722 MST, the pilot advised, "it's getting worse up higher, I'm gonna have to turn around and reroute," and asked for the closest airport. The controller advised the pilot of the location of Santa Rosa Route 66 Airport (SXU), Santa Rosa, New Mexico; however, when the pilot asked about the SXU weather, the controller could not provide that information because it was not available to him in his system. The controller then advised the pilot that the closest airport in front of him was Moriarty Airport (0E0), Moriarty, New Mexico. After the pilot said that he would try for 0E0, the controller stated that weather information was unavailable for that airport (it also was not in the controller's system).

About 1728 MST, the pilot again asked the controller for a cloud tops report. The controller replied that he did not have a cloud tops report but solicited a pilot report (PIREP) from a Boeing 737 pilot at flight level (FL) 190 over 0E0. The 737 pilot reported that he saw overcast conditions on his descent to Albuquerque International Sunport Airport, Albuquerque, New Mexico; that a layer appeared to be between 16,000 ft and FL180; and that the ceiling was "way below" him. About 1729 MST, the accident pilot advised the controller that he would "just keep going and hopefully it'll break up here for me [and] open up"; the controller acknowledged the transmission. About 6 minutes later, the airplane crashed about 7 miles from an automated surface observing system (ASOS) in Clines Corners, New Mexico (station identifier KCQC).[2]

Although the pilot indicated his intent to divert to SXU and 0E0, both of which were equipped with automated weather observing systems (AWOS), no weather information was available to the controller for either airport because the weather observing stations for SXU and 0E0 had not been adapted, or incorporated, into the ZAB en route automation modernization system (ERAM).[3,4] (The industry term "adapted" means that the weather site is incorporated into

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[1] The probable cause of this accident was the noninstrument-rated pilot's decision to initiate the flight into known deteriorating weather conditions and his continued visual flight into instrument meteorological conditions, which ultimately resulted in a loss of airplane control. Contributing to the accident was the air traffic controller's failure to provide additional assistance to the pilot when it was apparent the pilot was having difficulties. More information about this accident, NTSB case number CEN15FA044, can be found in the Aviation Accident Database at www.ntsb.gov.

[2] FAA-H-8083-16A, *Glossary*, defines an ASOS as "a weather observing system that provides minute-by-minute weather observations, such as temperature, dewpoint, wind, altimeter setting, visibility, sky condition, and precipitation." FAA-H-8083-16A can be accessed online at www.faa.gov.

[3] FAA Advisory Circular (AC) 150/5220-16D, *Automated Weather Observing Systems (AWOS) for Non-Federal Applications*, defines an AWOS as a "computerized system that automatically measures one or more weather parameters, analyzes the data, prepares a weather observation that consists of the parameter(s) measured, provides dissemination of the observations and broadcasts the observation to the pilot in the vicinity of the airport…" The AC defines five types of AWOSs, with AWOS III and AWOS IV being the most advanced. The SXU AWOS and the 0E0 AWOS were both AWOS IIIs. AC 150/5220-16D can be accessed online at www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5220-16.

the ARTCC ERAM's database.) Aside from soliciting a PIREP, neither the controller nor his supervisor attempted to obtain additional weather information for the pilot, even though the pilot asked twice about cloud tops. The controller stated in a postaccident interview that he did not consider directing the pilot to the AWOS frequencies for the diversion airports or asking the supervisor for help obtaining airport weather.

In addition, the controller did not attempt to contact the AWOS stations directly at the diversion airports for weather information. The ZAB National Air Traffic Controllers Association (NATCA) representative indicated that phone numbers for all AWOS/ASOS sites within a ZAB sector are not instantly available on sector; controllers are not able to dial an AWOS/ASOS (outside line) from their position at ZAB. Unless pilots are in range to receive a given station's radio broadcast to obtain weather themselves, a controller without an outside telephone line available at his or her position would have to ask a supervisor to call an unadapted AWOS/ASOS site (such as SXU and 0E0) to obtain the current weather information.

The ZAB controller also did not obtain weather information from the KCQC ASOS, which was near where the airplane crashed, even though its data are adapted into the ZAB ERAM. The controller was unaware of the data because he had never requested weather in the ERAM from an ASOS not associated with an airport, and, according to the ZAB NATCA representative, "many controllers certified on the sector where the accident occurred are not aware and/or were not trained that the KCQC ASOS was an adapted weather site." Further, the controller did not request information from the National Weather Service (NWS) center weather service unit (CWSU) located within ZAB even though the ZAB CWSU could access weather information from one of the diversion airports and data on cloud top heights. The controller and his supervisor indicated that they did not consider the CWSU an asset for providing tactical weather assistance. The NTSB interviewed another ZAB supervisor who believed that weather information for all airports in ZAB airspace was available to controllers at the control positions. She was aware that she could call AWOS/ASOS phone numbers from the supervisor's desk but never thought to go to the CWSU for airport weather information.

Andrews, Texas

On February 5, 2015, about 0048 central standard time (CST), a Beechcraft A36, N29AC, collided with terrain while landing at Andrews County Airport (E11), Andrews, Texas. The commercial pilot and one passenger sustained serious injuries, and two passengers sustained minor injuries; the airplane was substantially damaged. The airplane was registered to and operated by a private pilot under the provisions of 14 *CFR* Part 91 as a personal flight; an instrument flight rules (IFR) flight plan was filed. The airplane impacted terrain about 3,000 ft short of the approach end of runway 16 at E11 and traveled about 1,000 ft before stopping. An initial postaccident examination of the airplane revealed 1/4 inch to 1/2 inch of ice on the leading

[4] As of March 27, 2015, ERAM replaced the en route host computer and backup system at 20 ARTCCs, including ZAB. According to the FAA, ERAM is a system of air traffic management designed to increase air traffic flow and improve automated navigation and conflict detection service.

edge of the wings, vertical stabilizer, horizontal stabilizer, windscreen, and several antennas on the fuselage.[5]

About 0013 CST, the pilot checked in with the Fort Worth ARTCC (ZFW). The controller issued the Midland International Airport (MAF), Midland, Texas, altimeter setting; asked the pilot if he was going to request the area navigation (RNAV) GPS runway 16 approach at E11; and later cleared the airplane to proceed directly to the initial approach fix.[6] About 0017 CST, the pilot asked for the weather observation for MAF.[7] The controller issued the weather observation for MAF but did not include the information in the remarks section.[8] The controller directed the pilot to descend and maintain 7,000 ft and then cleared the airplane for the RNAV GPS runway 16 approach to E11. About 0039 CST, the controller confirmed that the airplane was at the initial approach fix and advised the pilot that radar services were terminated, that he could change to the advisory frequency, and to cancel his IFR flight plan. There were no further communications between controllers and the pilot, and the pilot attempted to land about 9 minutes later.

The accident pilot had obtained the E11 weather on frequency before the approach, so he had the relevant weather information for his destination airport. However, the ZFW controller was unaware of this and did not issue or ensure that the accident pilot had the current E11 weather. In a postaccident interview, the controller stated that he provided MAF weather based on the pilot's request but did not provide E11 weather because it was not adapted into the ZFW ERAM. The controller further indicated that if a pilot needed weather for an airport weather station that was not adapted into the ZFW ERAM, the pilot was responsible for getting it and that numerous airports in the ZFW airspace did not have their weather information adapted into the ZFW ERAM.[9] The controller and his supervisor also indicated that they had never called an AWOS for additional weather information. Another ZFW controller indicated in postaccident interviews that he had never been trained on or witnessed someone using an outside line at the sector to call an AWOS/ASOS to obtain weather, and a third ZFW controller stated that some of the ZFW controllers were unaware of alternate weather sources beyond the weather stations included in the ERAM.

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[5] The probable cause of this accident was the pilot's failure to note that icing conditions existed in the airport area despite having received that information in a preflight briefing, which resulted in his flight into an area of icing and the subsequent loss of airplane control due to ice accumulation on the airplane. More information about this accident, NTSB case number CEN15LA137, can be found in the Aviation Accident Database at www.ntsb.gov.

[6] MAF is located about 29 miles south-southeast of E11. MAF provided approach control services for E11 until the facility closed at 0000, after which ZFW assumed responsibility for air traffic control (ATC) services within MAF's delegated airspace.

[7] The February 4, 2015, 2353 weather observation reported wind from 020° (true) at 15 knots, visibility 9 statute miles, overcast skies at 800 ft above ground level (agl), temperature 0° C, dew point -2° C, and altimeter 30.36 inches of mercury. Remarks included peak wind from 020° (true) at 27 knots at 2317 CST and a ceiling of 600 ft agl, variable 1,100 ft agl.

[8] Although the remarks were not relevant to the accident, the fact that the controller did not include them is indicative of a lack of complete weather dissemination. For more information on the importance of issuing weather observation remarks, see National Transportation Safety Board, *Crash During a Nighttime Nonprecision Instrument Approach to Landing, UPS Flight 1354, Airbus A300-600, N155UP, Birmingham, Alabama, August 14, 2013*, AAR-14/02 (Washington, DC: NTSB, 2014).

[9] According to the ZFW program operations field manager, the ZFW ERAM had the capacity for 500 weather stations but currently had only 142 stations available for access at the ATC positions.

Discussion

ERAM Programming

Even if a station's weather information is available throughout the national airspace system (NAS), availability of a weather station's data to en route controllers at their positions is not guaranteed unless the ERAM at the ARTCC has been appropriately programmed. According to the FAA, up to 500 surface weather stations can be adapted (programmed) into an ARTCC's ERAM, making their data available to controllers. Each ARTCC's local airspace and procedures office reviews a national list of adaptable stations, identifies airports within their airspace with at least one published approach, and directs the local facility automation support team (FAST) to adapt surface weather stations associated with those airports.[10] Once a station is adapted into the ARTCC's ERAM, the local airspace and procedures office then requests that the weather message switching center replacement (WMSCR), a publicly accessible (via subscription) database of weather and other information, transmit that station's weather data to the ARTCC.[11] The FAA can only include weather data in the WMSCR from type-certificated and commissioned AWOS III and AWOS IV because they are the most advanced and provide a complete meteorological aerodrome report. The ERAM system can only adapt weather data that is in the WMSCR.

The Clines Corners accident investigation revealed that weather station data from 0E0, one of the diversion airports, was available in the WMSCR but had not been adapted into ZAB's ERAM, so the controller was unable to access it. Data from the KCQC ASOS located about 7 miles from the accident location, but not associated with an airport, was adapted and available to the controller in the ERAM; however, the controller was unaware of the data because he had never requested weather in the ERAM from an ASOS not associated with an airport, and many controllers were unaware or were not trained that the KCQC ASOS was an adapted weather site.

After these accidents, on June 25, 2015, the FAA issued a memorandum to each ARTCC directing that "within 30 days of the date of this memo, each ARTCC is required to review the list of available weather stations for their airspace and direct the Facility Automation Support Team (FAST) to adapt any additional sites pertaining to them. FAST must adapt the additional weather stations on the next available chart date and by no later than August 20 [2015]. Each facility must review and update their list of weather stations quarterly." The memorandum also stated that a complete list of available weather information was available at www.aviationweather.gov and indicated that a list of all of the stations in United States, Mexico, and Canada, known as the "ADDS [aviation digital data service] station.txt file," can be requested via the Internet.[12] However, an AWC employee has advised the NTSB that the ADDS station.txt file is not a comprehensive list of all surface weather stations that are currently

[10] Every 28 days, an ARTCC receives a national list of adaptable stations derived from a station list on the Aviation Weather Center's (AWC) website (www.aviationweather.gov).

[11] The FAA uses the WMSCR to make aviation weather data available from various sources, including AWOSs, to pilots for forecasting, flight planning, and other purposes.

[12] The link provided in the memorandum was www.aviationweather.gov/adds/dataserver_current//httpparam?dataSource=stations&requestType=retrieve&format=csv&stationString=~mx%20~ca%20~us. The memorandum is in the public docket for NTSB case number CEN15FA044, which is available online at www.ntsb.gov.

available and that several web sites "have dozens, if not hundreds, more ASOS and AWOS observations than are on ADDS."[13]

Although the FAA attempted to address the issue of ERAM programming with its 2015 memorandum, the NTSB is concerned that the ADDS station.txt file referenced by the memorandum is not a complete list and is, therefore, inadequate in identifying all of the weather stations that the ARTCCs could adapt. As a result, ARTCCs may not be adapting all geographically applicable and available weather stations from the WMSCR into their ERAMs. We conclude that the lack of such available weather data at controllers' positions could mean that applicable and accurate weather data are not being relayed to pilots. Therefore, the NTSB recommends that the FAA require ARTCCs to adapt all applicable weather reporting stations available in the WMSCR into their ERAMs. Further, we are concerned that controllers and their supervisors might not be fully aware of all of the applicable stations that could be in their ERAMs. Therefore, the NTSB recommends that the FAA ensure that air traffic controllers and their supervisors are familiar with all surface weather stations within their area of responsibility, including surface weather stations not located at airports.

Acquiring Weather Information

These investigations revealed a lack of training for controllers on how to obtain certain weather information if it is not readily available to them at their positions. FAA Order 7110.65, *Air Traffic Control*, section 2-6-1, states that controllers should "become familiar with pertinent weather information when coming on duty, and stay aware of current weather information needed to perform ATC duties." FAA Joint Order 3120.4N, *Air Traffic Technical Training*, chapter 4, "Training Requirements for Air Traffic Control Specialists," provides general information for limited aviation weather reporting station weather observers and indicates that controllers should have recurrent training on "weather and other conditions that affect flight." However, these requirements do not offer any specific training for or guidelines about how controllers can obtain additional weather information if it is not readily available through regular channels.

In the accidents discussed in this report, the controllers were unfamiliar with how to solicit additional sources of useful weather information when such information was needed and not immediately available to them at their positions. The Clines Corners accident investigation revealed that the controller did not attempt to call the AWOS directly, ask for help obtaining weather information from his supervisor, or direct the accident airplane to the AWOS frequencies for the diversion airports.[14] Regarding the Andrews accident investigation, the E11 weather was not adapted into the ERAM, but neither the controller nor his supervisor called the AWOS directly to obtain weather information for E11, and interviews with other ZFW controllers revealed a lack of training or knowledge of how to obtain alternate sources of weather.

[13] The AWC employee further stated, "My understanding is that WMSCR is a superset of what's on ADDS for US observations." This document is in the public docket for NTSB case number CEN15FA044, which is available online at www.ntsb.gov.

[14] As stated earlier, ZAB controllers and supervisors may not be aware that AWOS/ASOS weather is available via telephone at most of these sites.

In addition, at no point during the two accidents did the controllers or their supervisors request additional weather information from a CWSU or the AWC. CWSUs can offer other types of weather information (especially regarding VMC, icing, and cloud height information) that AWOSs and ASOSs may not be able to provide. Thus, even if all geographically applicable AWOSs and ASOSs are adapted into an ARTCC's ERAM, as requested in Safety Recommendation A-16-47, additional weather information from the CWSUs can be necessary and valuable for controllers and pilots.

Regarding the Clines Corners accident, the CWSU was open and within about 100 ft of the controller's physical area inside the ARTCC, had computer access to surface weather observations not available at the controller's position, and would likely have been able to provide detailed information on cloud top heights, which would not have been available from an AWOS or ASOS.[15] During postaccident interviews, the controller working the accident airplane, his supervisor, and another ZAB supervisor indicated that the CWSU was not considered an option for immediate weather assistance; they were unaware of the value that the CWSU would have been able to provide. Regarding the Andrews accident, the ZFW CWSU was closed just before the accident; however, contact information for the AWC was available but unused.

When requested by ATC, CWSUs have supported tactical weather needs during emergency situations for years. For example, in September 2011, a noninstrument-rated pilot became caught on top of clouds near Lamoni, Iowa. The pilot had very little flying experience and needed to be talked down by ATC. A CWSU meteorologist provided detailed weather updates regarding airports in VMC, and the pilot successfully landed 45 minutes later in Kirksville, Missouri. In addition, on June 13, 2003, at the Denver ARTCC, the CWSU was advised by an area supervisor that a general aviation pilot was in trouble because of icing conditions. The CWSU meteorologist advised that the pilot should descend the aircraft to at or below 12,000 ft, which led the pilot to exit the icing hazard.

The NTSB interviewed meteorologists-in-charge (MICs) at CWSUs throughout the country to determine how often ATC calls upon them to provide tactical weather assistance to controllers who are assisting pilots. The MIC at the CWSU located within the Minneapolis ARTCC indicated that requests for tactical support come about once per month; on one occasion, the MIC indicated that he stayed on the phone listening to an ASOS broadcast, updating the weather conditions while a controller tried to help a pilot land safely.[16] The MIC at the CWSU located within the Boston ARTCC also indicated that they have an average of one flight assist per month, which we attribute to a positive relationship between the CWSU and the local ARTCC. The MIC at the ZFW CWSU indicated that they receive an average of three aircraft-in-distress calls per year from controllers requesting assistance.

The NTSB is concerned that the controllers in the Clines Corners and Andrews accidents were not aware of how to obtain additional useful weather information. Further, we are concerned that despite the established capabilities and success of CWSUs in performing immediate weather support functions to help controllers, the option to request support from the

[15] The accident pilot had requested cloud top data twice from the controller.
[16] Further documentation on this event was not available.

CWSUs may not be known or considered by some controllers and supervisors in the ATC workforce (or may not be a standard procedure in some sectors).

With today's technology, controllers should not tell a pilot that no weather information is available; additional weather information is available through the proper channels if the controllers are aware of how to obtain it.[17] The NTSB concludes that obtaining additional sources of weather information is critical for controllers when pilots encounter potentially significant weather situations, and some sectors may not emphasize the importance of this task to their controllers. Therefore, the NTSB recommends that the FAA require training for all air traffic controllers and their supervisors on all available methods and procedures for acquiring surface weather information at airports and other weather reporting stations in the controllers' areas of jurisdiction. This training should include the CWSUs' capabilities in providing immediate tactical weather support to ATC; when CWSU support can and should be requested; and how to acquire NWS support when CWSUs are closed.

Availability of Weather Data

These investigations and subsequent research revealed that although a weather station meets FAA type-certification standards and is available via radio and/or telephone to pilots, its data may not be available to controllers because the data is not being transmitted to the WMSCR. Data from AWOSs that are federally maintained are automatically transmitted to the WMSCR, but nonfederal AWOS data need to be transmitted via a third-party vendor or service provider.[18] The NTSB is concerned that some nonfederal AWOS III and AWOS IV installations in the NAS, such as the AWOS III at SXU, may meet FAA type-certification and commissioning standards but do not disseminate their weather information to the WMSCR.[19] While data may be available via ground-to-air radio, telephone, or websites providing "advisory only" weather information, these data may be unavailable for flight planning via approved FAA sources; may be unavailable to the NWS for weather forecasting, computer modeling, and advisory issuance; and cannot be adapted into an ARTCC ERAM's database because the ERAM can only receive data that are in the WMSCR.

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[17] An additional capability that would likely assist CWSU tactical weather support for ATC in the en route environment is CWSU access to laptop computers or other mobile Internet-connected devices that would allow a CWSU meteorologist to deliver real-time graphical weather products in person to supervisors and controllers throughout the ARTCC. Such a capability would be dependent upon an available Internet connection (such as wireless capabilities on the control room floor). We believe that as widespread prioritization of the understanding of CWSU weather support functions is made, capabilities such as mobile platforms (and the required Internet connectivity), which meteorologists can use to deliver even better weather service to ATC, should be prioritized as well.

[18] According to FAA Order 6700.20B, *Non-Federal Navigational Aids, Air Traffic Control Facilities, and Automated Weather Systems*, a nonfederal AWOS is owned by an entity other than the federal government. FAA Order 6700.20B can be found online at www.faa.gov/documentLibrary/media/Order/FAA_Order_6700.20B.pdf. FAA AC 150/5220-16D indicates that an AWOS that has been manufactured, installed, and maintained according to the criteria in AC 150/5220-16D "may be eligible (subject to additional criteria) to transmit its weather information, directly or indirectly, to the FAA for subsequent national dissemination and may be eligible for funding under Federal grant programs."

[19] The Director of the Civil Aeronautics Program at the University Research Foundation in Greenbelt, Maryland, estimated that there are about 400 nondisseminating commissioned nonfederal AWOS systems. According to the FAA, currently 955 nonfederal AWOS III or AWOS IV installations provide weather information to the WMSCR, with another 20 nonfederal AWOS III or AWOS IV installations whose weather information is reported manually by an FAA facility for subsequent transmission to the WMSCR.

The Clines Corners accident investigation revealed that weather data from SXU, the closest airport to the pilot when he first indicated that he wanted to divert, was not disseminated to the WMSCR because of a lack of local funding to support the FAA-required third-party vendor to transmit the data to the WMSCR.[20] After NTSB investigators discussed this issue with New Mexico state officials, the state of New Mexico decided that 90% of third-party vendor subscription costs to a local airport authority would be reimbursed under an existing aviation maintenance grant beginning July 1, 2015. State officials indicated that the Clines Corners and other accidents influenced this decision. Several other states have allocated funds to relieve the financial burden for local entities to provide their nonfederal AWOS weather data to the WMSCR and the public, and some states have funded the development and implementation of an FAA-approved interface to facilitate dissemination of their state's nonfederal AWOS III and AWOS IV data. According to the National Association of State Aviation Officials (NASAO), "funding at the state-level has demonstrated significant differences directly to improving aviation safety through the dissemination of non-federal weather data into the national system."[21]

While the NTSB is pleased with the actions that some state aviation officials have taken to increase the volume of nonfederal AWOS III and AWOS IV data transmitted to the WMSCR, we are concerned that nonfederal AWOS III and AWOS IV installations in other states may meet FAA type-certification and commissioning standards but do not disseminate their weather information to the WMSCR. We note that these nonfederal AWOS III and AWOS IV installations have already been established, maintained by the local and state authorities, and maintained to required commissioning standards; however, their data are not being fully utilized to aid controllers because the data are not disseminated to the WMSCR. We conclude that not making all commissioned nonfederal AWOS III and AWOS IV data available in the WMSCR limits the safety benefit from the investments these nonfederal organizations have made; making this data available would benefit aviation safety and allow ATC to access additional weather information to help pilots. Therefore, the NTSB recommends that the FAA modify its equipment, systems, and/or procedures to ensure that data from all commissioned, nonfederal AWOS III and AWOS IV systems nationwide are directly and timely available to the WMSCR and to air traffic controllers at their work stations for providing real-time assistance to pilots requesting weather information along their route of flight.

[20] According to AC 150/5220-16D, type-certified and commissioned AWOS III and AWOS IV data may be nationally disseminated by the FAA via an FAA-approved third-party vendor or state agency, which is responsible for all costs associated with moving the AWOS data to the WMSCR. The owner of the nonfederal AWOS must pay for any fees and/or additional equipment associated with the third-party service.

[21] For more information, see the June 24, 2015, letter from NASAO to the NTSB, which is available in the public docket for NTSB case number CEN15FA044 at www.ntsb.gov.

Recommendations

To the Federal Aviation Administration:

Require air route traffic control centers to adapt all applicable weather reporting stations available in the weather message switching center replacement into their en route automation modernization systems. (A-16-47)

Ensure that air traffic controllers and their supervisors are familiar with all surface weather stations within their area of responsibility, including surface weather stations not located at airports. (A-16-48)

Require training for all air traffic controllers and their supervisors on all available methods and procedures for acquiring surface weather information at airports and other weather reporting stations in the controllers' areas of jurisdiction. This training should include the center weather service units' (CWSU) capabilities in providing immediate tactical weather support to air traffic control; when CWSU support can and should be requested; and how to acquire National Weather Service support when CWSUs are closed. (A-16-49)

Modify your equipment, systems, and/or procedures to ensure that data from all commissioned, nonfederal automated weather observing system (AWOS) III and AWOS IV systems nationwide are directly and timely available to the weather message switching center replacement system and to air traffic controllers at their work stations for providing real-time assistance to pilots requesting weather information along their route of flight. (A-16-50)

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Adopted: October 27, 2016