PROVIDING AVIATION WEATHER SERVICES TO THE FEDERAL AVIATION ADMINISTRATION

HEARING

BEFORE THE

SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT

COMMITTEE ON SCIENCE AND TECHNOLOGY

HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

JULY 16, 2009

Serial No. 111–43

Printed for the use of the Committee on Science and Technology

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00001 Fmt 6011 Sfmt 6011 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

PROVIDING AVIATION WEATHER SERVICES TO THE FEDERAL AVIATION ADMINISTRATION

PROVIDING AVIATION WEATHER SERVICES TO THE FEDERAL AVIATION ADMINISTRATION

HEARING

BEFORE THE

SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT

COMMITTEE ON SCIENCE AND TECHNOLOGY

HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

JULY 16, 2009

Serial No. 111–43

Printed for the use of the Committee on Science and Technology

Available via the World Wide Web: http://science.house.gov

U.S. GOVERNMENT PRINTING OFFICE

50–747PDF WASHINGTON : 2010

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON SCIENCE AND TECHNOLOGY

HON. BART GORDON, Tennessee, *Chair*

JERRY F. COSTELLO, Illinois
EDDIE BERNICE JOHNSON, Texas
LYNN C. WOOLSEY, California
DAVID WU, Oregon
BRIAN BAIRD, Washington
BRAD MILLER, North Carolina
DANIEL LIPINSKI, Illinois
GABRIELLE GIFFORDS, Arizona
DONNA F. EDWARDS, Maryland
MARCIA L. FUDGE, Ohio
BEN R. LUJÁN, New Mexico
PAUL D. TONKO, New York
PARKER GRIFFITH, Alabama
STEVEN R. ROTHMAN, New Jersey
JIM MATHESON, Utah
LINCOLN DAVIS, Tennessee
BEN CHANDLER, Kentucky
RUSS CARNAHAN, Missouri
BARON P. HILL, Indiana
HARRY E. MITCHELL, Arizona
CHARLES A. WILSON, Ohio
KATHLEEN DAHLKEMPER, Pennsylvania
ALAN GRAYSON, Florida
SUZANNE M. KOSMAS, Florida
GARY C. PETERS, Michigan
VACANCY

RALPH M. HALL, Texas
F. JAMES SENSENBRENNER JR., Wisconsin
LAMAR S. SMITH, Texas
DANA ROHRABACHER, California
ROSCOE G. BARTLETT, Maryland
VERNON J. EHLERS, Michigan
FRANK D. LUCAS, Oklahoma
JUDY BIGGERT, Illinois
W. TODD AKIN, Missouri
RANDY NEUGEBAUER, Texas
BOB INGLIS, South Carolina
MICHAEL T. MCCAUL, Texas
MARIO DIAZ-BALART, Florida
BRIAN P. BILBRAY, California
ADRIAN SMITH, Nebraska
PAUL C. BROUN, Georgia
PETE OLSON, Texas

SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT

HON. BRAD MILLER, North Carolina, *Chair*

STEVEN R. ROTHMAN, New Jersey
LINCOLN DAVIS, Tennessee
CHARLES A. WILSON, Ohio
KATHY DAHLKEMPER, Pennsylvania
ALAN GRAYSON, Florida
BART GORDON, Tennessee

PAUL C. BROUN, Georgia
BRIAN P. BILBRAY, California
VACANCY
RALPH M. HALL, Texas

DAN PEARSON *Subcommittee Staff Director*
JAMES PAUL *Democratic Professional Staff Member*
TOM HAMMOND *Republican Professional Staff Member*
MOLLY O'ROURKE *Research Assistant*

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00006 Fmt 5904 Sfmt 5904 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

C O N T E N T S

July 16, 2009

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00007 Fmt 5904 Sfmt 5904 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Page

Appendix 2: Additional Material for the Record

PROVIDING AVIATION WEATHER SERVICES TO THE FEDERAL AVIATION ADMINISTRATION

THURSDAY, JULY 16, 2009

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, DC.

The Subcommittee met, pursuant to call, at 11:02 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Brad Miller [Chairman of the Subcommittee] presiding.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00009 Fmt 6633 Sfmt 6633 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

BART GORDON, TENNESSEE
CHAIRMAN

RALPH M. HALL, TEXAS
RANKING MEMBER

U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON SCIENCE AND TECHNOLOGY

SUITE 2320 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6301
(202) 225–6375
TTY: (202) 226–4410
http://science.house.gov

Subcommittee on Investigations and Oversight

Hearing on

Providing Aviation Weather Services to the Federal Aviation Administration

Thursday, July 16, 2009
11:00 a.m. – 1:00 p.m.
2318 Rayburn House Office Building

Witness List

Mr. David Powner
Director
Information Technology Management Issues
Government Accountability Office

Dr. Jack Hayes
Assistant Administrator
National Weather Service
National Oceanic and Atmospheric Administration

Mr. Richard Day
Senior Vice President for Operations
Air Traffic Organization
Federal Aviation Administration

HEARING CHARTER

SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

Providing Aviation Weather Services to the Federal Aviation Administration

THURSDAY, JULY 16, 2009
11:00 A.M.–1:00 P.M.
2318 RAYBURN HOUSE OFFICE BUILDING

Witnesses

- **Mr. David Powner,** Director, Information Technology Management Issues, Government Accountability Office
- **Dr. John L. (Jack) Hayes,** Assistant Administrator for National Weather Service, National Oceanic and Atmospheric Administration
- **Mr. Richard Day,** Senior Vice President for Operations, Air Traffic Organization, Federal Aviation Administration

Introduction: Aviation Weather Service Consolidation

The Subcommittee on Investigations and Oversight meets on July 16, 2009 to examine the Federal Aviation Administration (FAA)'s efforts to reorganize the aviation weather services provided by the National Weather Service (NWS). The Federal Aviation Administration has been pushing the National Weather Service to reorganize its aviation weather services by consolidating from the twenty-one regional centers, called Central Service Weather Units (CWSUs), down to one national center. The ostensible reasons for this request were a desire to reduce the costs to FAA, which reimbursed NWS for their aviation services, and to improve and make more consistent the weather products provided by NWS forecasters. However, no proposal from NWS to consolidate services has shown significant savings and the lack of metrics on the performance of the CWSUs or the quality of services from CWSUs as perceived by FAA makes it impossible to demonstrate reliably whether the proposed alternative organization would provide better forecast services or enhance air traffic management. Finally, any reorganization carries real risks to air traffic flow and public safety. In light of these risks, the lack of clear baseline metrics of the current systems' performance and assurance that the proposed reorganization will offer benefits in terms of safety, traffic management or costs, the decisions to reorganize the current system and to consider only one option for that reorganization are not well justified or supported.

The Current System for Providing Aviation Weather Services

The FAA and NWS have operated an aviation weather system in which NWS forecasters are co-located with air traffic controllers at the twenty-one Air Route Traffic Control Centers (ARTCC) around the country. Weather conditions have a significant impact on air transport. Many flight delays and disruptions to air traffic flow are attributable to unfavorable weather conditions and weather has been a factor in a number of accidents. The current system evolved out of recommendations from the National Transportation Safety Board (NTSB) that such regional distribution of forecasters would enable them to work directly with air traffic controllers to deal with severe or rapidly changing weather conditions and emergencies. This distributed approach to services was endorsed in a 1995 National Academy of Science report as well.

The ARTCCs handle planes as they traverse the country. Planes are managed by airport traffic control towers for take-offs and landings and then are passed to the Terminal Radar Approach Towers for the Departure and Approach phases of a flight. Aircraft en route between airports are managed by the ARTCCs. Each ARTCC has an NWS Center Weather Service Unit (CWSU) housed in the same building with four forecasters assigned to each of the 21 ARTCCs. The forecasters typically provide services 16 hours a day, seven days a week—which is the peak time for commercial and general aviation.

Aviation weather forecasts out of the CWSUs are not the sole source of weather information for the national air space. Weather Forecasting Offices (WFO) around the country provide continuous weather updates twenty-four hours a day and support local airports. However, aviation forecasting is a specialized application because of the specific needs of aviation. Winds and weather at different altitudes can make an enormous difference in aviation, but may be purely academic from the perspective of forecasting whether the local community will get showers or just clouds. Weather patterns vary enormously from region-to-region and from season-to-season. Aviation weather forecasters develop very specific local knowledge to help support the work of the air traffic controllers and the aviation community. The large airlines typically have their own weather service that they get under contract with private providers. These private providers use NWS data, but run the data through their own models designed to meet the specific needs of the commercial carrier.

The Subcommittee has reviewed more than a dozen documented cases of air traffic controllers seeking emergency help from weather service forecasters to get a plane safely back on the ground. Frequently, those stories do not involve severe weather, but simple common occurrences such as a private aircraft losing instrumentation and finding itself stranded above endless cloud cover. Forecasters who can find the break in the clouds, work with the air traffic controller to get the heading right and work to bring the plane to the ground before it runs out of fuel make the difference between a safe return and potential tragedy.

The annual costs for running this distributed system are in the range of $12 million. This covers both the technology acquired for the CWSUs as well as the 84 weather forecasting positions assigned across the network.

FAA Pushes to Change this System and the NWS Responds

In 2005, FAA asked NWS to propose a consolidation of weather services down to one center with the goal of saving $2 million a year in aviation weather forecasting costs. NWS provided a proposal that would move the aviation weather forecasters back to local Weather Forecast Offices and would meet the $2 million savings goal. FAA rejected that proposal as well as a subsequent proposal that would have brought some consolidation, but not down to one center. As of July 2009, NWS has now submitted their third proposal to the FAA. FAA intends to respond to that proposal by early August.

The new NWS proposal would consolidate the CWSUs down to two centers (this is similar to their last, rejected proposal)—one in Kansas City to handle the Southern Tier of the U.S. and one in Silver Spring, Maryland to handle the Northern Tier. Staffing would be reduced from 84 forecasters to just 50 forecasters and managers split between the two centers as well as the one remaining ARTCC in Anchorage, Alaska. Coverage would be 24 hours a day, seven days a week.

FAA argues that consolidating to one center will provide a "single authoritative source" for aviation weather forecasts and eliminate variation in the quality of service and products that have been found across the current, distributed system. In the mid-2000s, FAA argued that some CWSUs were not as good as others and that the variation in products from one center to the next led to confusion. NWS took these criticisms to heart and has been working to improve and standardize the services provided by CWSUs across the country. However, according to the National Air Traffic Controllers Organization, air traffic controllers at the ARTCCs—the men and women who rely on the CWSUs—are very strong advocates for keeping the forecasters on site and available to them to deal with emergencies. Their view is that consolidation would negatively impact their ability to do their jobs of keeping the national airspace safe.

FAA also argues that such a consolidation should produce savings. However, the NWS proposal suggests that it will take a decade or more to realize any savings. The annual costs reimbursed to the NWS by FAA run on the order of $12 million. Under the new proposal, the annual costs of a consolidated system will be in the $11 million range. Transition costs for setting up two new centers, acquiring new technologies, running a demonstration test, and relocating staff will run $12 million. It would take a decade to earn back the costs of the transition.

The NWS proposes to set up a center to run a side-by-side test of the performance of a consolidated center for comparison with the performance of the 21 regional centers. They would ask the National Academy of Sciences to monitor and evaluate the outcome of the test. However, there are problems with the proposed test and challenges in designing any reliable test, especially within the time period currently allotted. The Government Accounting Office (GAO) highlights these challenges in their testimony.

Degraded Service and Safety Questions

One lost asset that would come from consolidation is the specialized local knowledge that currently informs aviation weather forecaster's work. The experts who currently work in the 21 regions have developed very precise knowledge of how weather patterns tend to emerge in each area. FAA hopes (as does NWS) that these experienced forecasters will be willing to relocate to the new centers. However, NWS admits that because of the turmoil and uncertainty surrounding the future of the existing 21 centers, the centers have been having trouble retaining staff in the last few years. Between projected retirements of more than 20 percent of the workforce and the uncertain fate of the CWSUs that has led many forecasters to seek other opportunities, the amount of local knowledge in the centers has been declining. These factors are making it more unlikely that the Kansas City and Silver Spring centers will be able to attract experienced aviation weather forecasters with a diverse mix of specialized, local information. One might argue that the national airspace has been made less safe simply because of the protracted efforts by FAA to force a consolidation of the CWSUs on the NWS.

GAO finds that neither FAA nor the NWS have established meaningful metrics for performance for the current 21 CWSUs. Further, GAO finds that FAA requirements for the weather service are in flux and not fully articulated. This makes it difficult, if not impossible, to run any meaningful test. If performance cannot be measured, one cannot accurately judge whether a new organizational approach is better or worse. Further, to staff up the center, NWS is proposing to take some of the most senior people out of the 21 CWSUs. This would leave CWSUs weaker and concentrate expertise in the consolidated center, leaving doubts about the fairness of the test results, especially if many of these senior staff are the same experienced people that the NWS projects to retire if they down-size from 84 forecasters to 50 staff.

Finally, there is a valid question about whether 50 staff would be sufficient to provide safe services. Each of the two centers will have five senior forecasters and 13 forecasters. Each center will operate 24 hours a day seven days a week for a total of 21 shifts. Projecting a morning and evening shift of six forecasters each and one forecaster on the midnight shift, the two centers together would have 12 forecasters for the entire lower-48 states on the morning shift as the national airspace swings into full flight. That compares to at least 20 forecasters on duty on any given morning shift right now. It is hard to see how the Nation's aviation system will be safer or how air traffic will be improved by cutting the people in weather forecasting by 40 percent. On a day where you have brush fires over L.A., fog in San Francisco, ash plumes over the Northwest, and thunder storms and tornadoes developing from the east face of the Rockies to the Great Lakes and the Gulf, that reduction in staffing could become a matter of life and death.

To his credit, the head of the National Weather Service is adamant that no change to the organization of the CWSUs will occur unless it can be clearly demonstrated that safety is not degraded. Given the lack of meaningful performance metrics, and the obvious decline in staffing that comes with the consolidation proposal, it appears on its face that this approach to aviation weather services will be impossible to convincingly demonstrate as being as safe or responsive to the needs of the Air Traffic Controllers and the aviation community. In light of the inevitable risks of moving from a proven system to an unproven system, the continued pressure from FAA for consolidation of NWS services is difficult to fathom.

Chairman MILLER. The hearing will now come to order. Good morning. Welcome to today's hearing, *Providing Aviation Weather Services to the Federal Aviation Administration*. This subcommittee has frequently struggled with the peculiar nonchalance of some government agencies in the face of the obvious dysfunction of critical programs.

Today we struggle with the equally-peculiar determination by the FAA to solve a problem that appears not to exist. To fix what ain't broke or appears not to be broke. The current system of delivering aviation weather products for air traffic controllers appears to work pretty well.

For 30 years the National Weather Service, the NWS, has provided support to the Federal Aviation Administration through aviation weather forecast units that are located at each of the 21 regional air centers. There are 84 weather forecasters spread among those 21 centers, offering 16 hours of service each day at an annual cost of $12 million. The system appears to be lean and well-suited to air traffic controllers' needs.

In 2006, Booz Allen Hamilton conducted a survey of air traffic controllers at seven of the regional air traffic centers under a contract with the FAA. Their conclusion was apparently not what FAA wanted to hear. Booz Allen found that air traffic controllers have a strong desire to have on-site weather forecasters and considered the services of the meteorologists highly valuable, and the air traffic controllers expressed "sensitivity"—that is the phrase of Booz Allen—to any actions that might terminate or severely alter the delivery method of those services.

This weather forecasting supports, by the FAA's own calculations, a $1 trillion aviation industry. Currently the FAA is spending approximately $1 billion a year on NextGen development, so the $12 million for aviation weather forecasting that FAA pays the NWS for seems like a bargain.

Now, still, FAA has pushed the National Weather Service to consolidate their aviation weather service to a single center since 2005. The FAA's determination to force the NWS to reorganize does not appear supported by any particular evidence of a significant problem with the current system that cannot be addressed within the system, or any evidence that there is substantial waste in the current system.

FAA's determination appears not supported by any evidence that a consolidated system would provide better service or even service as good as what the NWS now provides.

Again, air traffic controllers like the NWS system just fine and don't want to change it. GAO concludes that the FAA settled for a solution for reorganizing aviation weather services before they could clearly articulate their own requirements for those services and before they had given any thought to how to measure existing performance. In other words, FAA decided on a solution before they figured out if they had a problem.

Only since the last GAO report of 2008 has the FAA and the National Weather Service begun to develop performance metrics for the aviation weather units. Now, for the first time, an exercise is underway by FAA and NWS to baseline the performance of existing units through these baselines—though these baselines are built on impressionistic interviews rather than a steady aggregation of hard performance numbers.

We all support performance-based decisions and a commitment to continuing improvement, two slogans the FAA and other government agencies frequently use, but the reality is that performance-based decisions-making—performance-based decision-making requires meaningful, rigorous performance metrics. The FAA does not have those but has determined that a new organizational structure is needed.

The FAA says that this consolidation will provide a solid platform to transition to the NextGen Air Transportation System, but we have—but they have not included NextGen's weather planning office in the discussion, about the requirements of the NWS, or in their evaluation of any of the proposed reorganizations.

The Federal Aviation Administration has claimed that the consolidation will save at least $2 million, but those savings can only come through reducing the number of weather forecasters who are dedicated to supporting the needs of aviation.

Ultimately, the FAA has pushed for a plan to consolidate aviation weather services that does not respond to a clearly-articulated need or problem and would change a system that has air traffic controllers' full support. A shift in how services are delivered will cost money to test, and if adopted, will create new risks that don't exist in the current system. Perhaps that will result in a greater mass, critical mass of expertise in one place, but the down-sizing of the staff will leave each forecaster responsible for more air space and deprive air traffic controllers of a forecaster to stand over their shoulder in a weather crisis, a critical mass of expertise that air traffic controllers care about a lot.

In preparing for this hearing the Subcommittee gathered information from the FAA, the NWS, the National Transportation Safety Board, the air traffic controllers' union,[1] the weather service employees' union,[2] and the Government Accountability Office. We also received the witnesses' testimony in recent days. The point of the exercise of this new structure is still hard to understand.

And with that I now recognize the Ranking Member, Dr. Broun from Georgia, for his opening statement.

[The prepared statement of Chairman Miller follows:]

PREPARED STATEMENT OF CHAIRMAN BRAD MILLER

Good morning.

This subcommittee has frequently struggled with the peculiar nonchalance of some government agencies in the face of that obvious dysfunction of critical programs. Today we struggle with the equally peculiar determination by the FAA to solve a problem that appears not to exist, to fix what ain't broke.

The current system for delivering aviation weather products for air traffic control appears to work pretty well. For thirty years, the National Weather Service (NWS) has provided support to the Federal Aviation Administration (FAA) through aviation weather forecast units that are located at each of the twenty-one regional air traffic centers. There are 84 forecasters spread among those 21 centers offering 16 hours of service each day at an annual cost of $12 million; the system appears to be lean and well suited to air traffic controllers' needs.

In 2006, Booz Allen Hamilton conducted a survey of air traffic controllers at seven of the regional air traffic centers under a contract with the FAA. Their conclusion

[1] The National Air Traffic Controllers Association
[2] The National Weather Service Employees Organization

was apparently not what FAA probably wanted to hear. Booz Allen found the air traffic controllers "have a strong desire to have on-site" weather forecasters and that they "considered the services of the . . . meteorologists highly valuable and expressed sensitivity to any actions that might terminate or severely alter the delivery method of these services."

This weather forecasting supports—by the FAA's own calculations—a one trillion dollar aviation industry. Currently, the FAA is spending approximately $1 billion a year on NextGen development, so the $12 million for aviation weather forecasting that the FAA pays the NWS seems like a bargain.

Still, FAA has been pushing the NWS to consolidate their aviation weather service to a single center since 2005. The FAA's determination to force the NWS to reorganize does not appear supported by any evidence of a significant problems with the current system that cannot be addressed within that system, or any evidence that there is substantial waste in the current system. FAA's determination appears not supported by any evidence that a consolidated system would provide better service, or even service as good as what the NWS now provides. Again, air traffic controllers like the NWS' service just fine and don't want to change it.

GAO concludes that the FAA settled on a solution for reorganizing aviation weather services before they could clearly articulate their own requirements for these services, and before they had given any thought to how to measure existing performance—in other words, FAA decided on a solution before they figured out if they had a problem. Only since the last GAO report of 2008 has the FAA and the National Weather Service begun to develop performance metrics for the aviation weather units. Now, for the first time, an exercise is finally underway by FAA and NWS to baseline the performance of the existing units-though these "baselines" are built on impressionistic interviews rather than a steady aggregation of hard performance numbers.

We all support performance-based decision-making and a commitment to continuous improvement—two slogans that the FAA likes to intone—but the reality is that performance-based decision-making requires meaningful, rigorous performance metrics. The FAA doesn't have those, but has already determined that a new organization structure is needed.

The FAA likes to claim that this consolidation will provide a solid platform to transition to the NextGen air management system. However, they have not included NextGen's weather planning office in the discussion about requirements for the NWS or in the evaluation of any of the proposed reorganizations.

The Federal Aviation Administration has claimed that consolidation will save at least $2 million, but those savings can only come through reducing the number of weather forecasters who are dedicated to supporting the needs of aviation.

Ultimately, the FAA has pushed for a plan to consolidate aviation weather services, that does not respond to a clearly articulated need or problem, and would change a system that has air traffic controllers' full support. A shift in how services are delivered will cost money to test and, if adopted, will create new risks that don't exist in the current system. Perhaps that will result in a greater "mass" of expertise in one place, but the down-sizing of the staff will leave each forecaster responsible for more air space, and deprives air traffic controllers of a forecaster to stand over their shoulder in a weather crisis.

In preparing for this hearing, the Subcommittee gathered information from the FAA, the NWS, the National Transportation Safety Board, the air traffic controllers union, the weather service employees union and the Government Accountability Office. We also received the witnesses' testimony in recent days. The point of the FAA's exercise is hard to understand.

Mr. BROUN. Thank you, Mr. Chairman. I want to welcome the witnesses here today and thank them for participating in this important hearing on the National Weather Service's aviation weather forecasting proposal to the FAA.

As an instrument-rated pilot myself, I understand that aviation weather forecasting is critically important. Aside from the obvious and primary concern of safety, the FAA estimates that weather-related delays have cost $41 billion in the socioeconomic impact on the U.S. economy. In order to ensure safety and mitigate these impacts, the Weather Service provides aviation weather information on a reimbursable basis to the FAA.

Since these organizations are tasked with providing aviation weather information and ensuring air traffic safety, coordination is imperative. Unfortunately, several reviews in recent years have found opportunities where coordination could be strengthened and services improved.

In an attempt to address these issues and decrease operating costs, the FAA requested the Weather Service to restructure its center, weather service units by consolidating offices, provide remote services, reduce personnel costs, and provide services 24 hours a day, seven days a week.

On June 3 the Weather Service issued its current plan after having two previous proposals rejected by the FAA. The proposal put forward in June by the Weather Service is far from perfect. I think they will even admit this. They clearly have to work—have work to do to establish performance baselines to ensure that service will not be degraded. They have challenges relating to infrastructure and technology. Questions remain about how this will fit within the FAA's NextGen initiative, if at all, and interagency collaboration remains a concern.

While it may seem that recent GAO reviews are critical of the Weather Service's proposals, one has to realize that the Weather Service is simply responding to the FAA's direction. This coordination process between the two entities is unique and perplexing. The FAA is acting as a customer for weather service products and has provided the Weather Service with its requirements. Because the FAA no longer considers private vendors an option for fulfilling these requirements, the Weather Service is in essence a sole source contractor for FAA; a situation vendors usually relish as it puts them in an advantageous negotiating position.

Instead, the Weather Service has put forth several proposals only to have them rejected, most recently because of cost. I hope the FAA realizes that new requirements are usually accompanied by new costs.

Sure, technological advancements improve processes, can achieve cost savings, but when a customer demands more from its vendor, it should be willing to pay for it. Similarly, if a customer wants to pay less for a product, they shouldn't be surprised when they get less in return.

This may seem like trivial bureaucratic bickering, but it has real world implications to both commerce and airline passenger safety. I am happy to hear the coordination between the two entities is strengthening and hope that the partnership can find a solution that is amenable to both parties because ultimately the customers are our constituents and the vendor is the government.

As a pilot myself, I will do everything I can to make sure this transaction goes smoothly and that the pilots and passengers in the air have the information that they desperately need to perform safe operations in their aviation endeavors.

With that, Mr. Chairman, I yield back the balance of my time. Thank you.

[The prepared statement of Mr. Broun follows:]

PREPARED STATEMENT OF REPRESENTATIVE PAUL C. BROUN

Thank you, Mr. Chairman. I want to welcome the witnesses here today, and thank them for participating in this important hearing on the National Weather Service's (NWS) aviation weather forecasting proposal to the Federal Aviation Administration (FAA).

As an instrument rated pilot myself, I understand that aviation weather forecasting is critically important. Aside from the obvious and primary concern of safety, the FAA estimates that weather related delays have a $41 billion socioeconomic impact on the U.S. economy. In order to ensure safety and mitigate these impacts, the NWS provides aviation weather information on a reimbursable basis to the FAA. Since these organizations are tasked with providing aviation weather information and ensuring air traffic safety, coordination is imperative.

Unfortunately, several reviews in recent years have found opportunities where coordination could be strengthened and services improved. In an attempt to address these issues and decrease operating costs, the FAA requested that the NWS restructure its center weather service units by consolidating offices, provide remote services, reduce personnel costs, and provide services 24 hours a day, seven days a week. On June 3, the NWS issued its current plan after having two previous proposal rejected by the FAA.

The proposal put forward in June by the NWS is far from perfect—I think even they will admit this. They clearly have work to do to establish performance baselines to ensure that service will not be degraded; they have challenges relating to infrastructure and technology; questions remain about how this will fit in with the FAA's NextGen initiative—if at all; and interagency collaboration remains a concern.

While it may seem that recent GAO reviews are critical of the NWS proposals, one has to realize that the Weather Service is simply responding to the FAA's direction. This coordination process between the two entities is unique and perplexing. The FAA is acting as a customer for NWS products and has provided NWS with its requirements. Because the FAA no longer considers private vendors an option for fulfilling these requirements, the NWS is in essence a sole-source contractor for FAA—a situation vendors usually relish as it puts them in an advantageous negotiating position. Instead, the NWS has put forth several proposals, only to have them rejected—most recently because of cost. I hope that the FAA realizes that new requirements are usually accompanied by new costs. Sure, technological advancements and improved processes can achieve cost savings, but when a customer demands more from its vendor, it should be willing to pay for it. Similarly, if a customer wants to pay less for a product, they shouldn't be surprised when they get less in return.

This may seem like trivial bureaucratic bickering, but it has real world implications to both commerce and airline passenger safety. I am happy to hear that coordination between the two entities is strengthening, and hope that the partnership can find a solution that is amenable to both parties, because ultimately the customers are our constituents, and the vendor is the government. As a pilot myself, I'll do everything I can to make sure this transaction goes smoothly.

With that, Mr. Chairman, I yield back my time.

Thank you.

Chairman MILLER. Thank you, Dr. Broun. I am not a pilot, but I am a frequent passenger as are all Members of Congress.

I ask unanimous consent that all additional opening statements submitted by Members be included in the record, and without objection is so ordered.

It is now my pleasure to introduce our first panel of witnesses. First is Mr. David Powner, a fairly frequent witness here for the Subcommittee. He is the Director of Information Technology Management Issues at the Government Accountability Office, the GAO. Dr. Jack Hayes is the Assistant Administrator for National Weather Service at the National Oceanic and Atmospheric Administration, NOAA. And Mr. Richard Day is the Senior Vice President for Operations of the Air Traffic Organization at the U.S. Federal Aviation Administration, the FAA.

Each of our witnesses should know you will have five minutes for your spoken testimony. Your written testimony will be included in

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00018 Fmt 6633 Sfmt 6601 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

the record for the hearing. When you have completed your spoken testimony, you will be given—you will begin—we will begin with questions, and each Member will have five minutes to question the panel.

It is the practice of the Subcommittee to receive testimony under oath. Do any of you have any objection to taking an oath? The record will reflect that none of the witnesses expressed an objection.

You also have the right to be represented by counsel. Do any of you have counsel here? The record will reflect that all the witnesses indicated that they did not have counsel.

And will you now please stand and raise your right hand? Do you swear to tell the truth and nothing but the truth? The record will reflect that all of the witnesses took the oath.

We will now begin with Mr. Powner of GAO. Mr. Powner, please begin.

STATEMENT OF MR. DAVID A. POWNER, DIRECTOR, INFORMATION TECHNOLOGY MANAGEMENT ISSUES, U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Mr. POWNER. Chairman Miller, Ranking Member Broun, we appreciate the opportunity to testify on our aviation weather work.

The National Weather Service supports the Federal Aviation Administration by providing aviation-related forecasts and warnings at air traffic control and route centers across the country. These forecasts and warnings include information on thunderstorms, air turbulence, and icing. These services are provided through an interagency agreement, and FAA reimburses NWS approximately $12 million annually for them.

Last year I testified on the many issues with this arrangement, which included NWS providing inconsistent weather products across the 21 en route centers, FAA's inability to clearly define requirements or what it needs, both agencies' lack of performance measures to ensure quality of weather observations, and multiple proposals to restructure that were each rejected.

A brief history of these proposals is worth revisiting. In 2005, FAA requested that NWS restructure to a smaller number of sites to reduce costs. In 2006, a proposal was submitted which FAA rejected in 2007, because it did not reduce the number of sites or costs. In December, 2007, FAA provided NWS with a new set of requirements and requested a proposal for three operational concepts. NWS provided this proposal in May, 2008, but FAA rejected it because the costs were too high.

In September, 2008, NWS—FAA requested that NWS provide another restructuring proposal by December, 2008, to go to two sites. NWS submitted this proposal last month, six months later than when it was due. The proposal reduces the weather units from 20 to two locations, reduces NWS staff from 84 to 50, is planned to take three years, will cost almost $13 million, and is expected to reduce the annual cost by roughly $2 million per year. FAA plans to respond to this proposal by August 3.

So four years into this we are now on our third major restructuring proposal with no clear business case driving the potential change. In addition, there are many challenges FAA and NWS must address if they decide to move forward with the latest proposal.

Before getting into these challenges I would like to acknowledge that there has been some progress by NWS in improving the consistency of their weather products and defining and baselining certain performance measures, but much work still remains here on both fronts.

Turning to the challenges. My written testimony lays out several major challenges if the current weather aviation structure is modified. I would like to highlight five of these.

First, interagency collaboration. These agencies have not worked well together to resolve issues and to accomplish meaningful change. Since 2005, FAA has rejected all proposals, and we have had four years of very little action.

Second, solidifying requirements. FAA provided a comprehensive set of requirements in January, 2008, and these have not been updated despite the fact that modifications have been discussed by the two agencies. It is extremely important to formally update requirements given the historical working relationship.

Third, aligning restructuring with the Next Generation Air Transportation System. Neither agency has ensured that the restructuring aligns with the NextGen national vision for restructuring air traffic facilities.

Fourth, ensuring no degradation of service. In its proposal NWS plans to demonstrate the new two-site operational concept in a nine-month demonstration project. In addition, NWS has proposed that an independent evaluation team of both government and industry officials review this demonstration. While these are logical steps, the performance measures to demonstrate no degradation of service have not been defined, and as we have stated prior, baseline metrics are limited. Ensuring no degradation of service will be extremely difficult, if not impossible, without having a clear set of performance metrics.

Fifth, technology transition. To restructure aviation weather services, both agencies need to modify weather systems. Moving forward NWS and FAA need to improve performance measures and continue to baseline performance, improve interagency collaboration by agreeing to a future concept of operations, finalize and clearly document requirements for aviation weather services, ensure that any restructuring is aligned with the NextGen initiative, undertake a comprehensive demonstration that measures success against baseline performance measures to ensure that any restructuring does not result in degraded service and does not jeopardize safety.

And finally, NWS and FAA need to effectively transition the technologies to a new operational concept, if, in fact, this is pursued.

Mr. Chairman, this concludes my statement. I would be pleased to respond to questions.

[The prepared statement of Mr. Powner follows:]

PREPARED STATEMENT OF DAVID A. POWNER

Mr. Chairman and Members of the Subcommittee:

Thank you for the opportunity to participate in today's hearing on the proposed changes to the aviation weather services provided at the Federal Aviation Administration's (FAA) en route centers. The National Weather Service (NWS) plays a significant role in providing weather services to the aviation community. NWS's weather products and data are vital components of FAA's air traffic control system, providing weather information to local, regional, and national air traffic management, navigation, and surveillance systems. NWS aviation weather products include forecasts and warnings of meteorological conditions that could affect air traffic, including thunderstorms, air turbulence, and icing. In addition to providing aviation weather products that are developed at its own facilities, NWS also provides staff on-site at each of FAA's en route centers—the facilities that control high-altitude flight outside the airport tower and terminal areas. This group of NWS meteorologists—called a center weather service unit—provides air traffic staff with forecasts, advisories, and periodic weather briefings on regional conditions.

Over the last few years, FAA and NWS have been exploring options for enhancing the efficiency of the aviation weather services provided at en route centers. In September 2005, FAA asked NWS to restructure its services to be more efficient. Since then, NWS has developed and submitted two proposals to FAA, both of which were rejected. NWS subsequently submitted another proposal. As requested, this statement summarizes our draft report that (1) determines the status and plans of efforts to restructure the center weather service units, (2) evaluates efforts to establish a baseline of the current performance provided by the center weather service units so that FAA and NWS can ensure that any operational changes do not degrade aviation weather services, and (3) evaluates challenges to restructuring the center weather service units.

In preparing our draft report and this testimony, we reviewed NWS's proposals and transition plans for restructuring the service units and FAA's response to NWS's proposals. We identified both agencies' efforts to establish a baseline of current performance and compared these efforts to government guidance and best practices of leading organizations in performance management. To identify challenges, we compared the agencies' plans with best practices of leading organizations in system development, interagency collaboration, and architecture planning. We also interviewed relevant agency officials. All of our work for this report was performed in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. A more detailed description of the scope and methodology of our draft report is provided in Attachment 1.

Background

FAA is responsible for ensuring safe, orderly, and efficient air travel in the national airspace system. NWS supports FAA by providing aviation-related forecasts and warnings at air traffic facilities across the country. Among other support and services, NWS provides four meteorologists at each of FAA's 21 en route centers to provide on-site aviation weather services. This arrangement is defined and funded under an interagency agreement.

FAA's Mission and Organizational Structure

FAA's primary mission is to ensure safe, orderly, and efficient air travel in the national airspace system. FAA reported that, in 2007, air traffic in the national airspace system exceeded 46 million flights and 776 million passengers. In addition, at any one time, as many as 7,000 aircraft—both civilian and military—could be aloft over the United States. In 2004, FAA's Air Traffic Organization was formed to, among other responsibilities, improve the provision of air traffic services. More than 33,000 employees within FAA's Air Traffic Organization support the operations that help move aircraft through the national airspace system. The agency's ability to fulfill its mission depends on the adequacy and reliability of its air traffic control systems, as well as weather forecasts made available by NWS and automated systems. These resources reside at, or axe associated with, several types of facilities: air traffic control towers, terminal radar approach control facilities, air route traffic control centers (en route centers), and the Air Traffic Control System Command Center. The number and functions of these facilities are as follows:

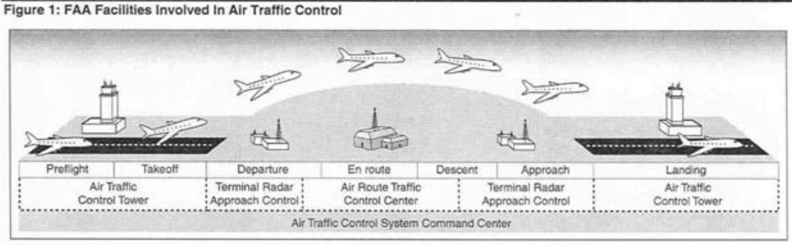
- 517 air traffic control towers manage and control the airspace within about five miles of an airport. They control departures and landings, as well as ground operations on airport taxiways and runways.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00021 Fmt 6633 Sfmt 6621 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- 170 terminal radar approach control facilities provide air traffic control services for airspace within approximately 40 miles of an airport and generally up to 10,000 feet above the airport, where en route centers' control begins. Terminal controllers establish and maintain the sequence and separation of aircraft.
- 21 en route centers control planes over the United States—in transit and during approaches to some airports. Each center handles a different region of airspace. En route centers operate the computer suite that processes radar surveillance and flight planning data, reformats it for presentation purposes, and sends it to display equipment that is used by controllers to track aircraft. The centers control the switching of voice communications between aircraft and the center, as well as between the center and other air traffic control facilities. Three of these en route centers also control air traffic over the oceans.
- The Air Traffic Control System Command Center manages the flow of air traffic within the United States. This facility regulates air traffic when weather, equipment, runway closures, or other conditions place stress on the national airspace system. In these instances, traffic management specialists at the command center take action to modify traffic demands in order to keep traffic within system capacity.

See Figure 1 for a visual summary of the facilities that control and manage air traffic over the United States.

Figure 1: FAA Facilities Involved In Air Traffic Control



Source: GAO analysis of FAA data.

NWS's Mission and Organizational Structure

The mission of NWS—an agency within the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA)—is to provide weather, water, and climate forecasts and warnings for the United States, its territories, and its adjacent waters and oceans to protect life and property and to enhance the national economy. In addition, NWS is the official source of aviation- and marine-related weather forecasts and warnings, as well as warnings about life-threatening weather situations.

The coordinated activities of weather facilities throughout the United States allow NWS to deliver a broad spectrum of climate, weather, water, and space weather services in support of its mission. These facilities include 122 weather forecast offices located across the country that provide a wide variety of weather, water, and climate services for their local county warning areas, including advisories, warnings, and forecasts; nine national prediction centers[1] that provide nationwide computer modeling to all NWS field offices; and 21 center weather service units that are located at FAA en route centers across the Nation and provide meteorological support to air traffic controllers.

NWS Provides Aviation Weather Services to FAA

As an official source of aviation weather forecasts and warnings, several NWS facilities provide aviation weather products and services to FAA and the aviation sector. These facilities include the Aviation Weather Center, weather forecast offices

[1] These centers include the National Centers for Environmental Prediction Central Operations, Aviation Weather Center, Environmental Modeling Center, Hydrometeorological Prediction Center, Ocean Prediction Center, Storm Prediction Center, Tropical Prediction Center/National Hurricane Center, Climate Prediction Center, and Space Environment Center.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00022 Fmt 6633 Sfmt 6621 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

located across the country, and 21 center weather service units located at FAA en route centers across the country.

Aviation Weather Center

The Aviation Weather Center located in Kansas City, Missouri, issues warnings, forecasts, and analyses of hazardous weather for aviation. Staffed by 65 personnel, the center develops warnings of hazardous weather for aircraft in flight and forecasts of weather conditions for the next two days that could affect both domestic and international aviation. The center also produces a Collaborative Convective Forecast Product, a graphical representation of convective occurrence at two-, four- and six-hours. This is used by FAA to manage aviation traffic flow across the country. The Aviation Weather Center's key products are described in Table 1.

Table 1: Key Weather Products Produced by the Aviation Weather Center

Weather product	Description
Significant Meteorological Information	An advisory concerning the occurrence or expected occurrence of potentially hazardous weather conditions that may affect the safety of aircraft operations in the en route environment.
Convective Significant Meteorological Information	A text product describing the occurrence or expected occurrence of thunderstorms and related weather conditions over the contiguous United States within 2 hours of issuance time.
Airman's Meteorological Information	An advisory concerning the occurrence or expected occurrence of certain weather conditions that may affect the safety of aircraft in the en route environment, but at intensities that do not meet the criteria to develop a Significant Meteorological Information product.
Collaborative Convection Forecast Product	A graphical convection forecast developed for strategic planning and management of en route air traffic. It is produced every 2 hours through collaboration – by way of an online chat room – among the Aviation Weather Center, the Meteorological Services of Canada, airline meteorology departments, FAA's Air Traffic Control System Command Center, and the center weather service units. These collaborative forecasts are produced between March 1 and October 31 every year.

Source: GAO analysis of NWS data.

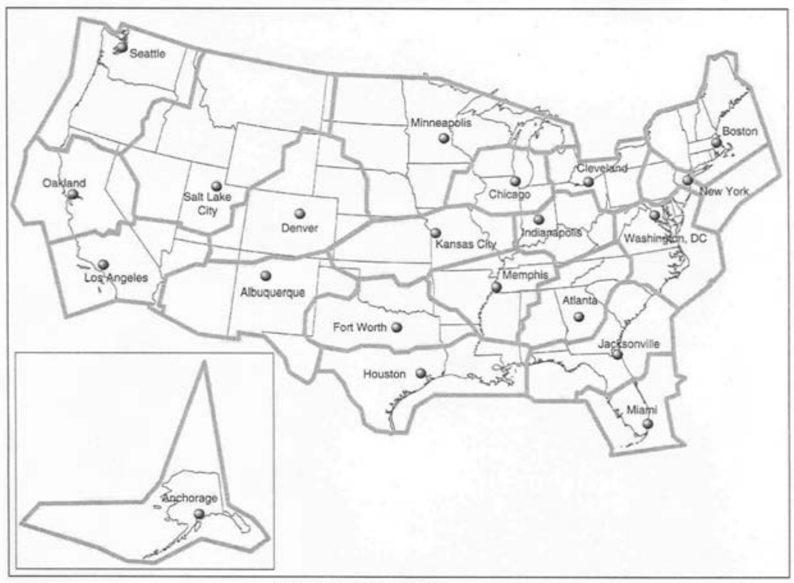
Weather Forecast Offices

NWS's 122 weather forecast offices issue terminal area forecasts for approximately 625 locations every six hours or when conditions change, consisting of the expected weather conditions significant to a given airport or terminal area and are primarily used by commercial and general aviation pilots.

Center Weather Service Units

NWS's center weather service units are located at each of FAA's 21 en route centers and operate 16 hours a day, seven days a week (see Fig. 2). Each center weather service unit usually consists of three meteorologists and a meteorologist-in-charge who provide strategic advice and aviation weather forecasts to FAA traffic management personnel. Governed by an interagency agreement, FAA currently reimburses NWS approximately $12 million annually for this support.

Figure 2: Center Weather Service Unit Locations and Service Areas



Sources: NWS (data), Map Resources (map).

Center Weather Service Units: An Overview of Systems and Operations

The meteorologists at the center weather service units use a variety of systems to gather and analyze information compiled from NWS and FAA weather sensors. Key systems used to compile weather information include FAA's Weather and Radar Processor, FAA's Integrated Terminal Weather System, FAA's Corridor Integrated Weather System, and a remote display of NWS's Advanced Weather Interactive Processing System. Meteorologists at several center weather service units also use NWS's National Center Advanced Weather Interactive Processing System. Table 2 provides a description of selected systems.

Table 2: Systems Used in the Center Weather Service Units

System	Description
Weather and Radar Processor	FAA's Weather and Radar Processor is used in en route centers and receives NWS products an data, information from automated weather sensors located at airports and data from other sources such as weather satellites and radars. It compiles the information and provides current weather and forecasts to air traffic supervisors, traffic flow managers, and the center weather service unit meteorologists.
Advanced Weather Interactive Processing System—Remote Display	NWS's Advanced Weather Interactive Processing System integrates hydrometeorological data from a variety of sources and produces graphical displays at NWS weather forecast offices, river forecast centers, and national centers. This system aids forecaster analysis and decision making. Meteorologists at the en route centers have access to this system through a remote display system, which provides a dedicated connection to the supporting weather forecast office. The Remote Display is funded by FAA, and maintenance is provided by NWS
Integrated Terminal Weather System	FAA's Integrated Terminal Weather System furnishes air traffic controllers and meteorologists with full-color graphic displays of weather information concerning airport terminal airspace within a 60-mile radius. The system also projects movement of severe weather systems up to 1 hour in the future and has been installed at 39 airports.
Corridor Integrated Weather System	FAA's Corridor Integrated Weather System is a prototype decision support tool that gathers weather information to help controllers select the most efficient routes for diverting traffic to avoid severe weather conditions. This system provides traffic flow managers with comprehensive convective weather data needed for tactical modifications, occurring within 2 hours, to the operational plan. These tactical modifications to the operational plan may include the weather impacts on air traffic control capacity, a need to modify the mitigation plan, and the execution of a modified mitigation plan.
National Center Advanced Weather Interactive Processing System	NWS's National Center Advanced Weather Interactive Processing System is the meteorological data visualization and integrated product generation system that provides a national scope of weather information. It is comprised of software that ingests, analyzes, displays, and integrates various types of hydrometeorological data including numerical model, surface, upper-air, satellite, radar, and text data. This system is only used in a few center weather service units.

Source: GAO analysis of FAA and NWS data.

NWS meteorologists at the en route centers provide several products and services to the FAA staff, including meteorological impact statements, center weather advisories, periodic briefings, and on-demand consultations. These products and services are described in Table 3. In addition, center weather service unit meteorologists receive and disseminate pilot reports, provide input every two hours to the Aviation Weather Center's creation of the Collaborative Convective Forecast Product, train FAA personnel on how to interpret weather information, and provide weather briefings to nearby terminal radar approach control facilities and air traffic control towers.

Table 3: Key Products and Services Provided by Center Weather Service Units

Product or service	Description
Meteorological impact statement	An unscheduled forecast of weather conditions that are expected to adversely impact the flow of air traffic in the en route center's area of responsibility within 4 to 12 hours.
Center weather advisory	A short-term, unscheduled warning of hazardous weather conditions used primarily by air crews to anticipate and avoid adverse weather conditions in the en route and terminal environments. It describes current weather conditions or adverse weather conditions – such as moderate to severe icing or turbulence, thunderstorms, low-level wind shear, and low ceilings and visibility—beginning within the next 2 hours.
Briefings	Short updates provided by NWS meteorologists to FAA supervisors twice a day; these briefings include current weather warnings and advisories, a summary of forecasted weather across the national airspace, terminal forecasts, and other pertinent meteorological information.
On-demand consultation	Unscheduled verbal presentations regarding ongoing or expected weather conditions provided to FAA traffic control personnel, supervisors, and other FAA facilities.

Source: GAO analysis of FAA and NWS data.

FAA Seeks to Improve Aviation Weather Services Provided at En Route Centers

In recent years, FAA has undertaken multiple initiatives to assess and improve the performance of the center weather service units.[2] Studies conducted in 2003 and 2006 highlighted concerns with the lack of standardization of products and services at NWS's center weather service units. To address these concerns, the agency spon-

[2] FAA is also involved in a longer-term initiative to increase the efficiency of the national airspace system and to improve its overall safety. This initiative, called the Next Generation Air Transportation System, is a joint effort of the Department of Transportation, the National Aeronautics and Space Administration, the White House Office of Science and Technology Policy, and the Departments of Homeland Security, Defense, and Commerce. FAA anticipates that this initiative may lead to major changes in the aviation weather program that would supersede its current efforts.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00025 Fmt 6633 Sfmt 6621 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

sored studies that determined that weather data could be provided remotely using current technologies, and that private sector vendors could provide these services. In 2005, the agency requested that NWS restructure its aviation weather services by consolidating its center weather service units to a smaller number of sites, reducing personnel costs, and providing products and services 24 hours a day, seven days a week. NWS subsequently submitted a proposal for restructuring its services, but FAA declined the proposal citing the need to refine its requirements.

In December 2007, FAA issued revised requirements and asked NWS to respond with proposals defining the technical and cost implications of three operational concepts. The three concepts involved (1) on-site services provided within the existing configuration of offices located at the 21 en route centers, (2) remote services provided by a reduced number of regional facilities, and (3) remote services provided by a single centralized facility. NWS responded with three proposals, but FAA rejected these proposals in September 2008, noting that while elements of each proposal had merit, the proposed costs were too high. FAA requested that NWS revise its proposal to bring costs down while stating a preference to move towards a single center weather service unit with a back-up site.

As a separate initiative, NWS initiated an improvement program for the center weather service units in April 2008. The goal of the program was to improve the consistency of the units' products and services. This program involved standardizing the technology, collaboration, and training for all 21 center weather service units and conducting site visits to evaluate each unit. NWS reported that it has completed its efforts to standardize the service units and plans to complete its site visits by September 2009. Table 4 provides a chronology of the agencies' assessment and improvement efforts.

Table 4: Chronology of Efforts by FAA and NWS

Time Frame	Activity
November 2003	FAA performed a functional audit of center weather service units and found that the services provided at different en route locations were inconsistent, the products were not standardized, and there was little communication and collaboration between neighboring service units.
September 2005	FAA requested that NWS restructure its aviation weather services to provide improved services more efficiently. Specifically, FAA requested that NWS consolidate 20 of the center weather service units (excluding the unit in Alaska) to a smaller number of sites, reduce NWS personnel costs by 20 percent, and deliver forecast products and services 24 hours a day, 7 days a week.
January 2006	FAA initiated an analysis of the value of different activities performed by the center weather service units. Similar to the 2003 study, the results of this analysis noted the lack of standardization of products, services, tools, and procedures. In addition, the report found that quality assurance was provided on an informal basis, there was no formal feedback process for products and services, and meteorological training was not standardized.
August 2006	NWS conducted a prototype in which center weather service unit products and services were completed and delivered remotely from the closest weather forecast office. This prototype showed that remote operations were possible and effective, but that they would be difficult to implement because of the need for cultural change, technology upgrades, and communication stability. Specifically, forecasters in the prototype were not able to provide dedicated support for the aviation mission because their other duties – including forecasting severe weather at the weather forecast office – took precedence. In addition, a collaboration technology used during the prototype was not operationally ready to use, servers were unstable, critical radar data were inconsistent with weather forecast office data, and communications lines were unstable throughout the prototype.
September 2006	An FAA study confirmed that it is possible to deliver weather information, products, and services from one or many remote locations with currently available state-of-the-art technology platforms.
October 2006	FAA administered a market survey to determine whether the private sector could provide remote weather services at a lower cost than currently provided. Ten organizations, including private sector firms and government-funded laboratories, responded that they could provide the services that FAA wanted. Separately, NWS presented its proposal for restructuring its aviation weather services to FAA. In this proposal, NWS suggested moving meteorologists from the en route centers to regional weather forecast offices, and providing remote aviation weather services from the weather forecast offices.
April 2007	FAA declined NWS's proposal. Instead, FAA reported that it would redefine its requirements for the functions provided by the center weather service units.
December 2007	FAA transmitted its redefined requirements to NWS and requested a written response detailing three different operational concepts.
April 2008	NWS initiated a short-term improvement program for the center weather service units. The goal of this program was to standardize the technology and training for the units to improve the consistency of products and services.
May 2008	In response to the new requirements, NWS provided FAA with three proposals to restructure the center weather service units.
September 2008	FAA rejected NWS's three proposals, stating that while elements of each proposal had merit, the agency could not accept them because the proposed costs were too high. Additionally, FAA requested that NWS deliver a revised proposal by December 2008, stating a preference to move toward a single center weather service unit with a back-up site.

Source: GAO analysis of NWS and FAA data.

Prior GAO Report Identified Concerns With Center Weather Service Units; Recommended Steps to Improve Quality Assurance

In January 2008, we reported on concerns about inconsistencies in products and quality among Center Weather Service Units.[3] We noted that while both NWS and FAA have responsibilities for assuring and controlling the quality of aviation weather observations, neither agency monitored the accuracy and quality of the aviation weather products provided at center weather service units. We recommended that NWS and FAA develop performance measures and metrics for the products and services to be provided by center weather service units, perform annual evaluations of aviation weather services provided at en route centers, and provide feedback to the center weather service units. The Department of Commerce agreed with our recommendations, and the Department of Transportation stated that FAA planned to revise its requirements and that these would establish performance measure and evaluation procedures.

Proposal to Consolidate Center Weather Service Units Is Under Consideration

NWS and FAA are considering plans to restructure the way aviation weather services are provided at en route centers. After a six-month delay, NWS sent FAA its latest proposal for restructuring the center weather service units in June 2009.[4] NWS's proposal involves consolidating 20 of the 21 existing center weather service units into two locations, with one at the Aviation Weather Center in Kansas City, Missouri and the other at a new National Centers for Environmental Prediction office planned for the DC metropolitan area of Maryland.[5] The Missouri center is expected to handle the southern half of the United States while the Maryland center is expected to handle the northern half of the United States. NWS plans for the two new units to be staffed 24 hours a day, seven days a week, and to function as backup sites for each other. These new units would continue to use existing forecasting systems and tools to develop products and services. See Figure 3 for a visual summary of the proposed consolidated center weather service unit facilities that control and manage air traffic over the United States.

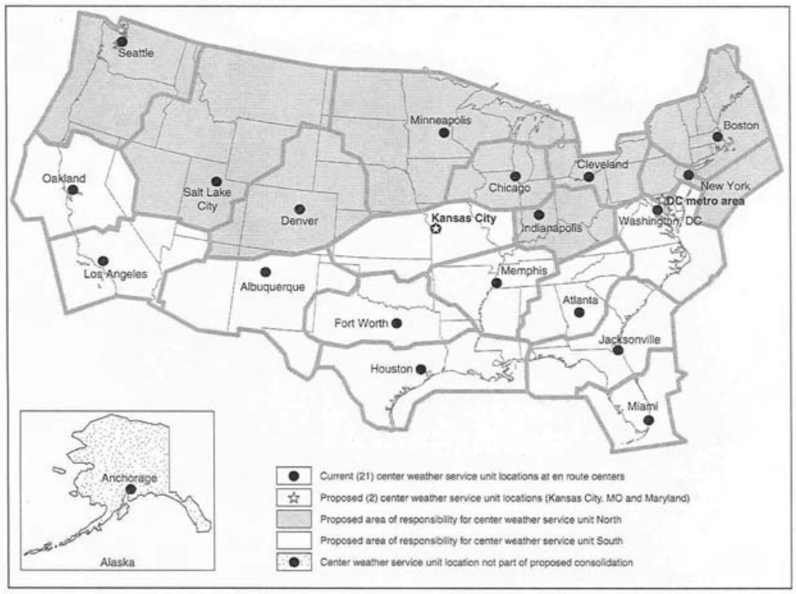
---

[3] GAO, *Aviation Weather: FAA Is Reevaluating Services at Key Centers; Both FAA and the National Weather Service Need to Better Ensure Product Quality,* GAO–08–258 (Washington, D.C.: Jan. 11, 2008).

[4] NWS sought two extensions to the December 2008 deadline in order to allow NWS and FAA a chance to address public misperceptions and to brief the incoming administration and to arrange discussions between the appropriate NWS and FAA executives.

[5] NWS proposed that the center weather service unit located in Anchorage, Alaska remain unchanged.

Figure 3: Proposed Center Weather Service Unit Structure



Sources: NWS (data), Map Resources (map).

While these new units would continue to use existing forecasting systems and tools to develop products and services, NWS has also proposed new products, services, and tools. Two new products are the collaborative weather impact product and the terminal radar approach control forecast. The former is expected to expand the Aviation Weather Center's existing Collaborative Convective Forecast Product to include convection, turbulence, icing, wind, ceiling/visibility, and precipitation type/intensity. The latter is expected to extract data from the Collaborative Weather Impact Product and include precipitation, winds, and convection for the terminal area; the display will allow the forecaster to layer this information on air traffic management information such as jet routes. In addition, NWS plans to create a web portal to allow FAA and other users to access its advisories, forecasts, products as well as national, regional, and local weather briefings. To support on-demand briefings at the new center weather service units, NWS plans to use collaboration tools, such as instant messaging and online collaboration software.

Given the reduced number of locations in the revised organizational structure, NWS also proposed reducing the number of personnel needed to support its operations from 84 to 50 full time staff—a reduction of 34 positions. Specifically, the agency determined that it will require 20 staff members for each of the new center weather service units; four staff members at the Alaska unit; five additional forecasters at the Aviation Weather Center to help prepare the Collaborative Weather Impact Product; and a quality assurance manager at NWS headquarters. NWS anticipates the staff reductions will be achieved through scheduled retirements, resignations, and reassignments. However, the agency has identified the transition of its existing workforce to the new centers as a high-impact risk because staff may decline to move to the new locations.

NWS also proposed tentative time frames for transitioning to the new organizational structure over a three-year period. During the first year after FAA accepts the proposal, NWS plans to develop a transition plan and conduct a nine-month demonstration of the concept in order to ensure that the new structure will not degrade its services. Agency officials estimated that initial operating capability would be achieved by the end of the second year after FAA approval and full operating capability by the end of the third year.

NWS estimated the transition costs for this proposal at approximately $12.8 million, which includes approximately $3.3 million for the demonstration. In addition, NWS estimated that the annual recurring costs will be about 21 percent lower than current annual costs. For example, using 2009 prices, NWS estimated that the new structure would cost $9.7 million—about $2.6 million less than the current $12.3 million cost. See Table 5 for the estimated costs for transitioning the centers.

Table 5: Approximate Costs (in millions) for the Transition

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total Cost
Legacy centers	$12.3	$12.7	$11.7	$1.6	$0	**$38.2**[a]
Transition costs	$4.6	$4.0	$3.0	$1.1	$0	**$12.8**[a]
New centers	$0	$0	$4.8	$10.8	$11.0	**$26.6**
Total	**$16.9**	**$16.7**	**$19.5**	**$13.5**	**$11.0**	**$77.6**

Source: GAO analysis of NWS data.

[a] Numbers do not add correctly due to rounding.

However, it is not clear when and if the agencies will move forward with the proposal. While FAA plans to respond in early August 2009, the agency could decide to reject the proposal or to modify its requirements, thereby triggering another NWS proposal. One consideration that may affect the proposal involves the current interagency agreement. The most recent agreement between the two agencies, signed in December 2007, is to expire at the end of September 2009. Before it expires, the two agencies could choose to exercise an option to continue this agreement for another year, terminate the agreement, or sign a new agreement. An FAA official reported that the agency wanted to create a new agreement that includes key dates from the proposal, such as those related to the concept demonstration. This official added that such agreements typically take time to develop and coordinate between the agencies.

NWS and FAA Are Working to Establish a Baseline of Current Performance, But Are Not Assessing Key Measures

According to best practices in leading organizations, performance should be measured in order to evaluate the success or failure of programs.[6] Performance measurement involves identifying performance goals and measures, establishing performance baselines, identifying targets for improving performance, and measuring progress against those targets. Having a clear understanding of an organization's current performance—a baseline—is essential to determining whether new initiatives (like the proposed restructuring) result in improved or degraded products and services.

In January 2008, we reported that NWS and FAA lacked performance measures and a baseline of current performance for the center weather service units and recommended that they develop performance measures.[7] In response to this recommendation, FAA established five performance standards for the center weather service units. FAA also recommended that NWS identify additional performance measures in its proposal for restructuring the center weather service units. While NWS subsequently identified eight additional performance measures in its proposal, FAA has not yet approved these measures. However, FAA has not yet approved these measures. All 13 performance measures are listed in Table 6.

[6] Department of the Navy, Office of the Chief Information Officer, *Guide for Developing and Using Information Technology (IT) Performance Measurements* (Washington, D.C.: Oct. 2001); General Services Administration, Office of Government-wide Policy, *Performance Based Management Eight Steps To Develop and Use Information Technology Performance Measures Effectively,* (Washington, D.C.: 1996).

[7] GAO–08–258.

Table 6: Performance Measures Identified by FAA and NWS

Performance measure	Description	Source
Service provision (organizational)	A measure of the hours and days per week that the unit is operating	Required by interagency agreement
Product participation	A measure of the frequency of the unit's participation in the development of the Collaborative Convective Forecast Product	Required by interagency agreement
Format consistency	A measure of the consistency of product formats, content, and procedures for the issuance of key existing products	Required by interagency agreement
Service provision (briefings)	A measure of the unit's provision of twice-daily stand up briefings	Required by interagency agreement and proposed by NWS
Forecast accuracy	A measure of the accuracy of forecasts used in traffic management decisions	Required by interagency agreement and proposed by NWS
Customer satisfaction	A measure of satisfaction with product quality, timeliness, accuracy, and customer service, as well as the number of complaints received	Proposed by NWS
Service delivery conformity	A measure of the conformity of both standardized and customized services to a checklist of components.	Proposed by NWS
Timeliness of on-demand services	A measure of the time taken to respond to requests for on-demand service	Proposed by NWS
Training completion	A measure of completion of standardized training	Proposed by NWS
Product consistency	A measure of the consistency of the proposed Collaborative Weather Impact Product with other products	Proposed by NWS
Timeliness of information updates	A measure of NWS's ability to provide timely updates to the proposed Collaborative Weather Impact Product	Proposed by NWS
Product availability	A measure of the availability of products via a proposed web portal	Proposed by NWS
Timeliness of management reports on the restructuring	A measure of NWS's ability to provide timely management reports associated with the restructuring.	Proposed by NWS

Source: GAO analysis of NWS and FAA data.

NWS officials reported that they have historical data for one of the 13 performance measures—participation in the Collaborative Connective Forecast Product—and are working to obtain a baseline for three other performance measures.[8] Specifically, in January 2009, NWS and FAA began evaluating how the center weather service units are performing and, as part of this initiative, are collecting data associated with organizational service provision, format consistency, and briefing service provision. As of June 2009, the agencies had completed evaluations of 13 service units and plan to complete evaluations for all 21 service units by September 2009.

However, the agencies have not established a baseline of performance for the nine other performance measures. NWS officials reported that they are not collecting baseline information for a variety of reasons, including that the measures have not yet been approved by FAA, and that selected measures involve products that have not yet been developed. A summary of the status of efforts to establish baselines and reasons for not establishing baselines is provided in Table 7.

[8] The agencies are working to obtain a baseline of the 21 center weather service units' performance in organizational service provision, format consistency, and briefing service provision.

Table 7: Status of Efforts to Identify Baseline Performance

Performance measure	Status of efforts to identify baseline performance	NWS reason for not capturing a performance baseline
Service provision (organizational)	Performance at 21 sites is being documented during site visits	Not applicable—is being measured
Product participation	Historical performance is being captured	Not applicable—is being measured
Format consistency	Performance at 21 sites is being documented during site visits	Not applicable—is being measured
Service provision (briefings)	Performance at 21 sites is being documented during site visits	Not applicable—is being measured
Forecast accuracy	Not measured	More work is needed to determine how to measure accuracy.
Customer satisfaction	Not measured	FAA has not approved this measure; in addition, NWS officials stated they do not currently have the resources to develop and implement this measure.
Service delivery conformity	Not measured	FAA has not approved this measure.
Timeliness of on-demand services	Not measured	FAA has not approved this measure.
Training completion	Not measured	FAA has not approved this measure.
Product consistency	Not measured	This product has not yet been developed.
Timeliness of information updates	Not measured	This product has not yet been developed.
Product availability	Not measured	This product has not yet been developed.
Timeliness of management reports on the restructuring	Not measured	These reports involve an initiative that has not yet been approved.

Source: GAO analysis of NWS and FAA data.

While four of the potential measures are tied to new products or services under the restructuring, the other five could be measured using current products and services. For example, accuracy and customer satisfaction axe measures that could be tracked for current operations. NWS continually measures the accuracy of a range of weather products—including hurricane and tornado forecasts. Customer satisfaction measures could be determined by surveying the FAA managers who receive the aviation weather products.

It is important to obtain an understanding of the current level of performance in these measures before beginning any efforts to restructure aviation weather services. Without an understanding of the current level of performance, NWS and FAA will not be able to measure the success or failure of any changes they make to the center weather service unit operations. As a result, any changes to the current structure could degrade aviation operations and safety—and the agencies may not know it.

NWS and FAA Face Challenges in Efforts to Modify the Current Aviation Weather Structure

NWS and FAA face challenges in their efforts to modify the current aviation weather structure. These include challenges associated with (1) interagency collaboration, (2) defining requirements, and (3) aligning any changes with the Next Generation Air Transportation System (NextGen))—along-term initiative to increase the efficiency of the national airspace system. Specifically, the two agencies have had difficulties in interagency collaboration and requirements development leading to an inability to reach agreement on a way forward. In addition, the restructuring proposals have not been aligned with the national strategic vision for the future air transportation system. Looking forward, if a proposal is accepted, the agencies could face three additional challenges in implementing the proposal, including (1) developing a feasible schedule that includes adequate time for stakeholder involvement, (2) undertaking a comprehensive demonstration to ensure no services are degraded, and (3) effectively reconfiguring the infrastructure and technologies to the new structure. Unless and until these challenges are addressed, the proposed restructuring of aviation weather services at en route centers has a reduced chance of success.

Interagency Collaboration

To date, FAA and NWS have encountered challenges in interagency collaboration. We have previously reported on key practices that can help enhance and sustain interagency collaboration.[9] The practices generally consist of two or more agencies

[9] GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration Among Federal Agencies,* GAO–06–15 (Washington, D.C.: Oct. 21, 2005).

defining a common outcome, establishing joint strategies to achieve the outcome, agreeing upon agency roles and responsibilities, establishing compatible policies and procedures to operate across agency boundaries, and developing mechanisms to monitor, evaluate, and report the results of collaborative efforts.

While NWS and FAA have established policies and procedures for operating across agencies through an interagency agreement and have initiated efforts to establish a baseline of performance for selected measures through their ongoing site evaluations, the agencies have not defined a common outcome, established joint strategies to achieve the outcome, or agreed upon agency responsibilities. Instead, the agencies have demonstrated an inability to work together to resolve issues and to accomplish meaningful change. Specifically, since 2005, FAA has requested that NWS restructure its aviation weather services three times, and then rejected NWS's proposals twice. Further, after requesting extensions twice, NWS provided its proposal to FAA in June 2009. As a result, it is now almost four years since FAA first initiated efforts to improve NWS aviation weather services, and the agencies have not yet agreed on what needs to be changed and how it will be changed. Table 8 lists key events.

Table 8: Key Events in FAA and NWS Interactions

Time frame	Activity
September 2005	FAA requested that NWS restructure its aviation weather services to consolidate operations in a smaller number of sites at a reduced cost.
October 2006	NWS provided a proposal to FAA on how to restructure aviation weather services; also, FAA administered a market study to determine whether the private sector could provide remote aviation weather services.
April 2007	FAA rejected NWS' proposal because it did not consolidate the offices to a smaller number of sites and it involved higher training costs. At that time, FAA decided to revise its requirements for aviation weather provided at the center weather service units.
December 2007	FAA provided NWS with a new set of aviation weather requirements.
May 2008	NWS provided FAA with three proposals to restructure the center weather service units.
September 2008	FAA rejected all three proposals and sent NWS back to the drawing board to create a hybrid solution at a lower cost by December 2008.
December 2008	NWS requested and FAA approved a 60 day extension on NWS's proposal deadline to address public misperceptions regarding the changes.
February 2009	NWS requested a 60-day extension on NWS's proposal deadline to allow the new NOAA administrator time to work with the then-unnamed FAA administrator on the consolidation. FAA approved a 30-day extension.
June 2009	NWS provided FAA with a proposal that would consolidate 20 of 21 center weather service units into two locations.

Source: GAO analysis of FAA and NWS data.

Until the agencies agree on a common outcome, establish joint strategies to achieve the outcome, and agree on respective agency responsibilities, they are unlikely to move forward in efforts to restructure weather services. Without sound interagency collaboration, both FAA and NWS will continue to spend time and resources proposing and rejecting options rather than implementing solutions.

Defining Requirements

The two agencies' difficulties in determining how to proceed with their restructuring plans are due in part to a lack of stability in FAA's requirements for center weather service units. According to the best practices of leading organizations, requirements describe the functionality needed to meet user needs and perform as intended in the operational environment.[10] A disciplined process for developing and managing requirements can help reduce the risks associated with developing or acquiring a system or product.

FAA released its revised requirements in December 2007 and NWS subsequently provided proposals to meet these requirements. However, FAA rejected all three of NWS's proposals in September 2008 on the basis that the costs of the proposals were too high, even though cost was not specified in FAA's requirements. NWS's latest proposal is based on FAA's December 2007 requirements as well as detailed discussions held between the two agencies in October 2008. However, FAA has not revised its requirement to reflect the guidance it provided to NWS in those discussions, including reported guidance on handling the Alaska center and moving to the two-center approach. Without formal requirements developed prior to the development of the new products and services, FAA runs the risk of procuring products and services that do not fully meet their users' needs or perform as intended. In addi-

[10] Carnegie Mellon University Software Engineering Institute, *Capability Maturity Model® Integration for Development, Version 1.2* (Pittsburgh, PA: August 2006). Capability Maturity Model® and Capability Maturity Modeling are registered in the U.S. Patent and Trademark Office. CMM is a service mark of Carnegie Mellon University.

tion, NWS risks continued investments in trying to create a product for FAA without clear information on what the agency wants.

Alignment with the Next Generation Air Transportation System

Neither FAA nor NWS have ensured that the restructuring of the center weather service units fits with the national vision for a Next Generation Air Transportation System (NextGen)—a long-term initiative to transition FAA from the current radar-based system to an aircraft-centered, satellite-based system. Our prior work on enterprise architectures shows that connecting strategic planning with program and system solutions can increase the chances that an organization's operational and IT environments will be configured to optimize mission performance.[11] Our experience with federal agencies has shown that investing in IT without defining these investments in the context of a larger, strategic vision often results in systems that are duplicative, not well integrated, and unnecessarily costly to maintain and interface.

The Joint Planning and Development Office[12] is responsible for planning and coordinating NextGen. As part of this program, the Joint Planning and Development Office envisions restructuring air traffic facilities, including en route centers, across the country as well as a transitioning to new technologies. However, NWS and FAA efforts to restructure the center weather service units have not been aligned with the Joint Planning and Development Office's vision for transforming air traffic control under the NextGen program. Specifically, the Chair of NextGen's weather group stated that Joint Planning and Development Office officials have not evaluated NWS and FAA's plans for restructuring the center weather service units, nor have they been asked to do so.

Other groups within FAA are responsible for aligning the agency's enterprise architecture with the NextGen vision through annual roadmaps that define near-term initiatives.[13] However, recent roadmaps for aviation weather do not include any discussion of plans to restructure the center weather service units or the potential impact that such a change could have on aviation weather systems. Additionally, in its proposal, NWS stated that it followed FAA's guidance to avoid tightly linking the transition schedule to NextGen's expected Initial Operating Capability in 2013, but recommended doing so since the specific role of the center weather service units in NextGen operations is unknown.

Until the agencies ensure that changes to the center weather service units fit within the strategic-level and implementation plans for NextGen, any changes to the current structure could result in wasted efforts and resources.

Schedule Development

Looking forward, if a proposal is accepted, both agencies could also face challenges in developing a feasible schedule that includes adequate time for stakeholder involvement. NWS estimated a three-year transition timeframe from current operations to the two-center approach. FAA officials commented that they would like to have the two-center approach in place by 2012. However, NWS may have difficulty in meeting the transition timeframes because activities that need to be conducted serially are planned concurrently within the three-year schedule. For example, NWS may need to negotiate with its union before implementing changes that affect working conditions—such as moving operations from an en route center to a remote location.[14] NWS officials acknowledge the risk that these negotiations can be prolonged and sometimes take years to complete. If the proposal is accepted, it will be important for NWS to identify activities that must be conducted before others in order to build a feasible schedule.

Demonstrating No Degradation of Service

If a proposal is accepted, both agencies could face challenges in demonstrating that existing services will not be degraded during the restructuring. In its proposal,

---

[11] GAO, *Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation*, GAO–06–831 (Washington, D.C.: Aug. 14, 2006).

[12] The Joint Planning and Development Office has multiple federal partners, including FAA; the Departments of Transportation, Commerce, Defense, and Homeland Security; the National Aeronautics and Space Administration; and the White House Office of Science and Technology Policy.

[13] These groups include the NextGen and Operations Planning Service Unit's Aviation Weather Office, Systems Engineering Office, and NextGen Integration and Implementation Office.

[14] NWS's agreement with its union includes the need to negotiate on the impact and implementation of any changes affecting working conditions before those changes can be implemented. As such, any effort to realign the center weather service units will involve negotiations between union employees and NWS management.

NWS identified preliminary plans to demonstrate the new operational concept before implementing it in order to ensure that there is no degradation of service. Key steps included establishing a detailed demonstration plan, conducting risk mitigation activities, and implementing a demonstration that is to last at least nine months. NWS also proposed that the demonstration will include an independent evaluation by a team of government and industry both before the demonstration, to determine if the demonstration is adequate to validate the new concept of operations, and after, to determine the success of the demonstration. In addition, throughout the nine-month demonstration, NWS plans to have the independent team periodically provide feedback, recommendations, and corrective actions.

However, as noted earlier, NWS has not yet defined all of the performance measures it will use to determine whether the prototype is successful. In its proposal, NWS stated that the agencies will begin to document performance metrics and develop and refine evaluation criteria during the demonstration. If NWS waits to define evaluation criteria during the evaluation, it may not have baseline metrics needed to compare to the demonstration results. Without baseline metrics, NWS may be unable to determine whether the demonstration has degraded service or not.

Technology Transition

Both agencies could face challenges in effectively transitioning the infrastructure and technologies to the new consolidated structure, if a proposal is accepted. In its proposal, NWS planned to move its operations from 20 en route centers to two sites within three years. However, to do so, the agencies will need to modify their aviation weather systems and develop a communications infrastructure. Specifically, NWS and FAA will need to modify or acquire systems to allow both current and new products for an expanded view of the country. Additionally, NWS will need to develop continuous two-way communications in lieu of having staff on-site at each en route center. NWS has recognized the infrastructure as a challenge, and plans to mitigate the risk through continuous dialogue with FAA. However, if interagency collaboration does not improve, attempting to coordinate the systems and technology of two agencies may prove difficult and further delay the schedule.

Implementation of Draft Recommendations Should Improve Interagency Approach to Aviation Weather

In our draft report, we are making recommendations to the Secretaries of Commerce and Transportation to improve the aviation weather products and services provided at FAA's en route centers. Specifically, we are recommending that the Secretaries direct the NWS and FAA administrators, respectively, to improve their ability to measure improvements in the center weather service units by establishing and approving a set of performance measures for the Center Weather Service Units, and by immediately identifying the current level of performance for the five potential measures that could be identified under current operations (forecast accuracy, customer satisfaction, service delivery conformity, timeliness of on-demand services, and training completion) so that there will be a baseline from which to measure the impact of any proposed operational changes.

In addition, we are recommending that the Secretaries direct the NWS and FAA administrators to address specific challenges by

- improving interagency collaboration by defining a common outcome, establishing joint strategies to achieve the outcome, and agreeing upon each agency's responsibilities;
- establishing and finalizing requirements for aviation weather services at en route centers;
- ensuring that any proposed organizational changes are aligned with NextGen initiatives by seeking a review by the Joint Program Development Office responsible for developing the NextGen vision; and
- before moving forward with any proposed operational changes, address implementation challenges by developing a feasible schedule that includes adequate time for stakeholder involvement; undertaking a comprehensive demonstration to ensure no services are degraded; and effectively transitioning the infrastructure and technologies to the new consolidated structure.

In summary, for several years, FAA and NWS have explored ways to improve the operations of the center weather service units by consolidating operations and providing remote services. Meanwhile, the two agencies have to make a decision on the interagency agreement, which will expire at the end of September 2009. If FAA and NWS are to create a new interagency agreement that incorporates key dates within the proposal, decisions on the proposal will have to be made quickly.

An important component of any effort to improve operations is a solid understanding of current performance. However, FAA and NWS are not working to identify the current level of performance in five measures that are applicable to current operations. Until the agencies have an understanding of the current level of performance, they will not be able to measure the success or failure of any changes to the center weather service unit operations. As a result, any changes to the current structure could degrade aviation operations and safety—and the agencies may not know it.

If the agencies move forward with plans to restructure aviation weather services, they face significant challenges including a poor record of interagency collaboration, undocumented requirements, and a lack of assurance that this plan fits in the broader vision of the Next Generation Air Transportation System. Moreover, efforts to implement the restructuring will require a feasible schedule, a comprehensive demonstration, and a solid plan for technology transition. Until these challenges are addressed, the proposed restructuring of aviation weather services at en route centers has little chance of success.

Mr. Chairman and Members of the Subcommittee, this concludes my statement. I would be pleased to respond to any questions that you may have at this time.

GAO Staff Acknowledgments

Key contributors to this testimony include Colleen Phillips, Assistant Director; Gerard Aflague; Kate Agatone; Neil Doherty; Rebecca Eyler; and Jessica Waselkow.

Attachment 1

Scope, and Methodology

For the draft report on which this testimony is based, we determined the status of NWS's plans for restructuring the center weather service units by reviewing the existing interagency agreement, FAA's proposed requirements, and NWS's draft and final proposals for addressing FAA's requirements. We analyzed NWS's draft transition schedules, cost proposals, and evaluation plans. We also interviewed NWS and FAA officials to obtain clarifications on these plans.

To evaluate the agencies' efforts to establish a baseline of the current performance provided by center weather service units, we reviewed documentation including FAA's performance standards, the current interagency agreement, NWS's restructuring proposals and Quality Assurance Surveillance Plan, and the agencies' plans for evaluating the centers. We compared the agencies' plans for creating a baseline of current performance with best practices for performance management by the Department of the Navy and General Services Administration.[15] We also interviewed NWS and FAA officials involved in establishing a baseline of current performance provided by center weather service units.

To evaluate challenges to restructuring the center weather service units, we reviewed agency documentation, including FAA's requirements document and NWS's proposals to restructure the center weather service units. We also reviewed planning documents for the Next Generation Air Transportation System. We compared these documents with best practices for system development and requirements management from the Capability Maturity Model® Integration for Development; and with GAO's best practices in interagency collaboration and architecture planning.[16] In addition, we interviewed NWS, FAA, and Joint Planning and Development Office officials regarding challenges to restructuring the center weather service units.

We performed our work at FAA and NWS headquarters offices, and FAA's Air Traffic Control System Command Center in the Washington, D.C., metropolitan area. We conducted this performance audit from August 2008 to July 2009, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evi-

[15] Department of the Navy, Office of the Chief Information Officer, *Guide for Developing and Using Information Technology (IT) Performance Measurements* (Washington, D.C.: Oct. 2001); General Services Administration, Office of Government-wide Policy, *Performance-Based Management Eight Steps To Develop and Use Information Technology Performance Measures Effectively,* (Washington, D.C.: 1996).

[16] Carnegie Mellon University Software Engineering Institute, *Capability Maturity Model® Integration for Development, Version 1.2* (Pittsburgh, PA: August 2006); GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration Among Federal Agencies,* GAO–06–15 (Washington, D.C.: Oct. 21, 2005); and GAO, *Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation,* GAO–06–831 (Washington, D.C.: Aug. 14, 2006).

dence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for findings and conclusions based on our audit objectives.

BIOGRAPHY FOR DAVID A. POWNER

Experience

Twenty years' experience in information technology issues in both public and private sectors.

Education

Business Administration, University of Denver

Senior Executive Fellows Program, Harvard University, John F. Kennedy School of Government

Director, IT Management Issues, U.S. Government Accountability Office

Dave is currently responsible for a large segment of GAO's information technology (IT) work, including systems development, IT investment management, health IT, and cyber critical infrastructure protection reviews.

In the private sector, Dave has held several executive-level positions in the telecommunications industry, including overseeing IT and financial internal audits, and software development associated with digital subscriber lines (DSL).

At GAO, Dave has led teams reviewing major IT modernization efforts at Cheyenne Mountain Air Force Station, the National Weather Service, the Federal Aviation Administration, and the Internal Revenue Service. These reviews covered many information technology areas including software development maturity, information security, and enterprise architecture.

Chairman MILLER. Thank you, Mr. Powner.

Dr. Hayes for five minutes.

STATEMENT OF DR. JOHN L. "JACK" HAYES, ASSISTANT ADMINISTRATOR FOR WEATHER SERVICES; DIRECTOR, NATIONAL WEATHER SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Dr. HAYES. Thank you, Mr. Chairman, and Mr. Broun and other Members of the Committee, for the opportunity to testify on the National Weather Service provision of aviation weather information to the FAA. I am Jack Hayes, the Assistant Administrator for Weather Services and the Director of the National Weather Service. The National Weather Service is a line office within the National Oceanic and Atmospheric Administration.

The Weather Service plays a critical role in providing weather information to the FAA in support of their mission for safe and efficient operation of the National Airspace System. We provide warnings, forecasts, meteorological advice, and consultation throughout all phases of flight, including pre-flight planning and operations. These services come from many National Weather Service offices, including our weather forecast offices, the Alaskan Aviation Weather Unit, the Volcanic Ash Advisory Centers, the Aviation Weather Center, and Center Weather Service Units, CWSUs for short.

We are committed to providing quality aviation weather services. Let me focus on CWSUs. Meteorologists at our CWSUs provide weather advisories, forecasts, and advice to air traffic management. The CWSUs are located at each of the 21 FAA air route traffic control centers. CWSUs operate 16 hours per day, typically between 5:00 a.m. and 9:00 p.m. local time, seven days a week when air traffic is at its peak.

Since the last hearing in 2008, FAA and the National Weather Service have worked to refine service requirements. The Weather Service delivered a revised response to FAA in June of this year. Our response provides—proposes, rather, to provide CWSU support from two centers in the lower 48 states. As part of our approach, we plan to conduct a demonstration validation or dem/val, to objectively test and validate the viability of this solution.

A critical component of our response, and prerequisite before any decision is made to change the operational structure of CWSU support, is to demonstrate the capability of meeting FAA requirements from two centers with no degradation of aviation weather services and no impact to safety. If the demonstration is successful, consolidation of 20 CWSUs in the lower 48 states into two centers is proposed. Each center would serve as an operational backup for the other.

New weather products and services, including the provision of 24 by seven or 24 hours a day, seven days a week, weather support services will be introduced to meet FAA requirements in support of the National Air Space System. We will work collaboratively with the FAA to plan, conduct, and evaluate the dem/val to ensure that the proposed structure does not degrade aviation weather services.

The National Academy of Sciences has agreed to provide unbiased expertise to oversee and evaluate the results of the dem/val. The FAA has stated that face-to-face services and briefings are no longer required. We believe new technology can be leveraged to allow remote service and improved consistency. Our response provides for remote briefing services to FAA Terminal Radar Approach Control and control tower personnel, which are currently not co-located with our CWSUs but have routine interactions with our forecasters.

The consolidated CWSU structure would reduce the staff from 84 to 50. I am committed to ensuring that any affected CWSU employee who wants a job with the National Weather Service will have one. We have reviewed our staffing model and are confident we can absorb the 34 positions through normal attrition.

Our 42-month schedule for transition to a consolidated CWSU structure, including a planning phase, a nine-month period for dem/val, followed by transition to the new structure. We have been working with the FAA to define future CWSU services. In addition, over the past 18 months we have been working to improve the consistency and quality of existing CWSU aviation weather services.

Our joint CWSU site evaluations and ongoing discussion with the FAA are helping us to establish and refine baseline performance measures by this fall. These measures will provide the basis for evaluating and continuing to improve our services.

NOAA recognizes the Next Generation Air Transportation System, or NextGen, will result in a system-wide air traffic management transformation. This transformation will affect how we collect, manage, and disseminate weather-related information and how the FAA makes weather-related decisions. We also recognize the need for close coordination with the federal weather community to meet NextGen weather support needs.

NOAA is working with the Joint Planning and Development Office to fully integrate NOAA's weather information and service improvements into the NextGen development. This will enable us to meet requirements for the transformation and ensure NOAA's contributions are compatible with NextGen decision support, dissemination, display systems, including inter-operability of any revised CWSU support structure.

Last week we received the GAO's draft report, "*Review of Aviation Restructuring.*" We are reviewing the draft report and developing our action plan. Moreover, we believe our June, 2009, response to the FAA for CWSU services addresses some of the key recommendations in the draft report, including a dem/val overseen by the National Academy of Sciences to ensure involvement of stakeholders in an unbiased evaluation.

Also highlighted in our response to the FAA is the importance of aligning organizational changes with NextGen initiatives. We agree with the need to establish baseline performance measures as stated by the GAO, and we are working to—now collecting data on four of the five standards originally developed by the FAA and the National Weather Service to establish that baseline.

We will continue to work together to review assessment and measure methods for the fifth proposed standard (forecast accuracy). These performance metrics are critical data points to evaluate the dem/val.

The National Weather Service reaffirms its commitment to providing critical weather support that assists the FAA in managing the National Air Space System. The National Air Space System must remain safe, efficient, and cost-effective for the people of this country.

Thank you for the opportunity to appear before you. I am happy to answer any questions you may have.

[The prepared statement of Dr. Hayes follows:]

PREPARED STATEMENT OF JOHN L. "JACK" HAYES

Thank you, Mr. Chairman and Members of the Subcommittee, for this opportunity to testify on the National Weather Service's provision of aviation weather information to the Federal Aviation Administration (FAA). I am Jack Hayes, Assistant Administrator for Weather Services and the Director of the National Weather Service (NWS). The Weather Service is a line office of the National Oceanic and Atmospheric Administration (NOAA), within the Department of Commerce (DOC).

Background

The NWS has an extensive infrastructure supporting the development of its products and services. The NWS issues more than a trillion forecasts, and 10,000 warnings annually for protection of life and property and enhancement of the national economy. Every day we process 1.7 billion surface and upper air observations from across the country and around the globe. These data are assimilated into complex computer models providing the backbone of weather information for all—government and private weather forecasters both nationally and internationally. The aviation industry uses this vast array of weather information for flight planning and safety.

The NWS has a long history of providing weather support for aviation dating back to 1914. The *Air Commerce Act of 1926* (44 Stat. 568), added specific responsibility for providing weather services to civil aviation. Today, NWS aviation services are focused on meeting the needs of the Nation in coordination with our partner, FAA. In 1994, Public Law 103–272 (49 U.S.C. § 44720(a)) directed the Secretary of Commerce to provide weather support for aviation and to give complete consideration to the recommendations of the FAA Administrator in doing so:

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00038 Fmt 6633 Sfmt 6621 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

"The Administrator of the Federal Aviation Administration shall make recommendations to the Secretary of Commerce on providing meteorological services necessary for the safe and efficient movement of aircraft in air commerce. In providing the services, the Secretary shall cooperate with the Administrator and give complete consideration to those recommendations."

Today, forecasters across the Nation comprise the aviation weather forecast team, including meteorologists at 122 local Weather Forecast Offices, 21 Center Weather Service Units (CWSUs), the Alaska Aviation Weather Unit in Anchorage, Alaska; and the Aviation Weather Center in Kansas City, Missouri.

The Aviation Weather Center operates 24 hours a day, seven days per week, to provide aviation warnings and forecasts of hazardous flight conditions at all levels within domestic and international air space including turbulence, icing, and convection forecasts. The Collaborative Convective Forecast Product, a graphical representation of expected convective occurrence at two-, four-, and six-hours, is produced by the Aviation Weather Center after collaboration with Meteorological Service of Canada, CWSUs, and meteorological offices of airlines and service providers.

On the local scale, the Weather Forecast Offices provide terminal area forecasts for approximately 625 locations every six hours, with additional updates as conditions change. These forecasts consist of the expected weather at a given airport or terminal area and are used primarily by commercial and general aviation pilots. The Alaska Aviation Weather Unit provides specialized products for the unique general aviation community and severe weather conditions in Alaska, and also includes the Anchorage Volcanic Ash Advisory Center, one of nine such advisory centers worldwide.

Center Weather Service Unit Support to the FAA

My testimony today will focus on services provided in support of the FAA by forecasters at our 21 CWSUs. CWSUs were established in 1978 in response to National Transportation Safety Board recommendation A–77–68 resulting from a serious weather-related accident over New Hope, Georgia, which caused numerous fatalities. This recommendation called for the FAA to, "Formulate rules and procedures for the timely dissemination by air traffic controllers of all available severe weather information to inbound and outbound flights in the terminal areas." Based on this recommendation, FAA, with the assistance of NWS, formed the CWSUs.

NWS forecasters at CWSUs provide weather advisories and forecasts to the FAA, and advise and consult with air traffic controllers, which helps to maintain a safe and efficient national airspace. The CWSUs are located at each of the 21 FAA Air Route Traffic Control Centers (ARTCC). CWSU meteorologists provide weather advisories valid for two hours or less describing areas of hazardous weather in progress or forecast to develop; forecasts for up to 12 hours describing areas of weather that may impact air traffic operations; twice daily face-to-face briefings; and on-demand consultations to ARTCC traffic managers. CWSU meteorologists also provide remote briefings telephonically, as needed, to FAA Terminal Radar Approach Control and control tower personnel, and they train controllers on the interpretation of weather information.

Under an interagency agreement, the FAA provides basic equipment, communications, space, and supplies for the CWSUs, and currently reimburses the NWS about $12 million per year. Based on local requirements, CWSUs operate 16 hours per day, typically between 5:00 a.m. and 9:30 p.m. local time, seven days a week, when air traffic is at its peak. If weather conditions pose a threat to an ARTCC's area of responsibility, our CWSU forecasters may work additional hours to support the ARTCCs.

Recent History of NWS and FAA Interactions to Improve CWSU Services

In 2005, the FAA provided NWS with feedback that service improvements from CWSUs were needed. In 2006, NWS proposed changes to CWSU services, which were not accepted by the FAA. The FAA determined the requirements for CWSU services were not well defined and needed to be solidified before any changes to CWSU services were made.

In January 2008, FAA provided a requirements document to the NWS for CWSU services. The requirements included an increase in coverage to 24 hours a day service seven days per week, improved product and service consistency, and a national situational awareness for weather. The FAA requested the NWS provide service solutions for three CWSU business models: a single site model; a regional model (more than one CWSU, but less than the current 21); and a model reflecting the current structure of 21 CWSUs. The NWS submitted its initial response to FAA in May 2008.

In September 2008, FAA determined that although there were positive elements in each of the three business models, none of models were acceptable and all were too costly. In their responding letter to NWS, FAA stated they did not require direct, face-to-face contact at each of their ARTCCs and they would support an approach utilizing two CWSUs. FAA agreed to work with NWS to further refine the CWSU requirements, with a final response from the NWS expected by the end of 2008. In October 2008, FAA and NWS worked together to revise the CWSU requirements to reflect the FAA's request to reduce costs and consolidate 20 CWSUs in the lower 48 states into two centers, leaving the Alaska CWSU as it is. The NWS prepared an updated response by December 2008, but did not provide it to FAA until June 2009 which allowed for review and consideration by the new Administration.

Overview of the NWS Response to the FAA for CWSU Services

The NWS's revised response proposes to meet FAA requirements by developing the capability to provide CWSU support from two centers in the lower 48 states. The response calls for development and demonstration test of a prototype. As a point of emphasis, a critical component of our response, and a prerequisite before any decision is made to change the operational structure of NWS CWSU support, is to demonstrate the capability of meeting FAA requirements from two centers with no degradation of aviation weather services and, at a minimum, no impact to safety. If the demonstration is successful, the response plans for a consolidation of 20 CWSUs in the lower 48 states into two centers: one in Kansas City, Missouri, co-located with the Aviation Weather Center; and the other co-located at the National Centers for Environmental Prediction in the Washington, D.C. area Each of these centers would serve as an operational backup for the other, should those services be necessary. The response also introduces a suite of new national forecast guidance products to emphasize consistency across the National Airspace System to meet the revised FAA requirements. We and the FAA believe this will enhance aviation safety.

We will work collaboratively with the FAA to plan, run, and evaluate a prototype, referred to as a demonstration/validation, to ensure the proposed structure for aviation services does not degrade aviation weather services. The Board on Atmospheric Sciences and Climate (BASC) of the National Academy of Sciences has agreed to oversee and evaluate the results of the demonstration/validation. The NWS believes this outside, unbiased group of experts is critical for determining the feasibility and prudence of moving to any revised CWSU structure while ensuring no degradation of service.

The FAA has stated face-to-face services and briefings from NWS forecasters at the ARTCCs are no longer required. The NWS believes new technology can be leveraged to allow remote service and improve consistency. Our response also provides for remote briefing services to FAA Terminal Radar Approach Control and control tower personnel, which are currently not co-located with CWSUs but have routine interactions with NWS forecasters. However, a rigorous demonstration of any new technology, products, and services must be conducted and independently evaluated before we modify our current structure. We will not proceed with any change that would jeopardize safety.

The consolidated CWSU structure would reduce NWS staff from 84 to 50. Any affected NWS CWSU employee who wishes to continue to work for the NWS will have the option of doing so. We have reviewed our staffing model and are confident we can absorb the 34 positions through normal attrition.

Our 42-month schedule for transition to a consolidated CWSU structure includes a planning phase, a nine-month period for the demonstration/validation, followed by transition to the new structure provided the demonstration/validation demonstrates no degradation of aviation weather services and aviation safety is enhanced. During the nine-month demonstration/validation period, current weather support will remain unchanged.

Ongoing Improvements to CWSU Services

While working with FAA to define future CWSU services, over the past 18 months we have been working to improve the consistency and quality of existing CWSU aviation weather services. Improvements to our aviation weather services include improved weather information with new graphic capabilities, a more concentrated focus on National Airspace System weather impacts, and improved consistency between forecasts across multiple ARTCCs. We also are improving our customer service by increasing CWSU meteorologists' understanding of air traffic flow management and FAA operations, initiating proactive communication to controllers, towers, and others in air traffic management, and improving access and usefulness of

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00040 Fmt 6633 Sfmt 6621 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

CWSUs Internet presence. We have implemented a methodology to measure weather impact on air traffic across 35 major airports, customized forecast criteria to specific airports to meet specific ARTCC needs, and are conducting CWSU site reviews. These site visits are conducted jointly by NWS and FAA management. Thirteen site reviews are complete and eight more will be done by September 2009. Taken together, we believe these are significant steps that have already improved weather services to our ARTCC partners.

Weather Information in the Next Generation Air Transportation System

The Next Generation Air Transportation System (NextGen) is intended to meet projected 2025 U.S. air transportation needs—significant growth in air traffic is projected. Given that weather is a factor in 70 percent of air traffic delays, NOAA is actively involved in NextGen through its participation on the Joint Planning and Development Office (JPDO) Board and in providing leadership for the JPDO Weather Working Group.

NOAA recognizes the NextGen will result in a system-wide air traffic management transformation that will affect the manner by which weather-related information is collected, managed, disseminated, and used in decision-making. The robust integration of weather data envisioned by the FAA will improve the efficiency and effectiveness of airspace use and airport throughput, and is expected to reduce the impacts to our nation's travelers and businesses when weather is a factor. To that end, NOAA is working with FAA to fully integrate NOAA's weather information and services improvements into NextGen development to meet requirements for the transformation and ensure NOAA's contributions are compatible with NextGen decision support, dissemination, and display systems. The NWS response to restructure CWSU support provides key links to NextGen and will ensure inter-operability of any revised CWSU support structure during the NextGen era. NWS planners will work closely with the FAA during any CWSU restructure to ensure a linkage into the NextGen program.

The vision of NextGen requires NOAA to develop a four dimensional grid of environmental data (referred to as the "4D Weather Cube") with fine scale forecasts of wind, temperature, cloud heights, visibility and thunderstorms. There are scientific challenges we must address to meet this vision. For example, we are developing the capability to forecast the development of a thunderstorm within airport airspace 30 minutes before it starts. Thunderstorms are a significant cause of air traffic delays. By forecasting the beginning of thunderstorms, we can provide greater advance notice, and air traffic managers can change aircraft routes and headings before the threat appears, which will mitigate the impact through the system, resulting in less impact to passengers and businesses. Forecasting the beginning of thunderstorms is a difficult scientific challenge, requiring greater sensing of the atmosphere through satellites, radars, and other methods, as well as higher resolution forecast models. NOAA is focused on meeting the scientific challenges associated with developing earlier thunderstorm forecasts, as well as improving forecasts for cloud heights and visibility, two other weather-related threats that impact aviation operations.

Another key component of the 4D Weather Cube will be probabilistic information that will help FAA decision-makers make more informed, risk-based decisions when appropriate. The probabilistic 4D Weather Cube will support both tactical decision-making (radar, one- to six-hour thunderstorm forecasts, observations, emergency support) and strategic decision-making (six to 30-hour forecasts of key parameters including icing, turbulence, convection, and winter weather ground support forecasts). The vision of the 4D Weather Cube is to support aircraft specific, runway specific, trajectory specific information as early as possible in the planning phase. The NWS vision is to issue "Warnings-on-Forecast" in four dimensions when probabilities of certain hazards exceed user agreed upon probabilistic thresholds within hazard areas. The key take-away for operations is to avoid the hazard areas.

Weather in the data cube will contain a constantly refreshed source of critical information, keeping the eyes of all decision-makers on target. All of the data will be network-enabled, using common standards and architectures. Network-enabled information access will foster a private-public partnership to keep the National Airspace System as efficient and safe as possible. Weather information in digital forms can "speak" from machine to machine, supporting the NextGen vision of integrating current and future sources of weather data. NWS efforts to build the 4D Weather Cube will include working closely with partners to ensure a fully unidirectional approach to National Airspace System support.

Finally, the NWS forecaster will remain a key component of the future forecast system supporting the FAA. The NWS forecaster will continue to assist FAA traffic managers and decision-makers, alerting them of rapidly changing conditions and the impacts on operations and safety.

The vision described above and the service improvements envisioned are still under development. Today, aviation products are generally in textual and graphic formats and their development is very labor intensive. Over the next five years, aviation elements will become available in digital as well as textual and graphical formats as we move forward towards the NextGen era. Furthermore, advances in the automation and rapidly updated (hourly) forecast routines of convective, low ceiling and visibility, icing, turbulence and wind in a digital environment will enable the NWS to focus our forecasters on improving decision support services to the FAA by allowing the forecaster to focus not only on the weather, but how the weather will potentially impact aircraft operations. These science and technology enablers, together with attention to risk management, will evolve CWSU products and services over the next five years and into the NextGen era. The anticipated advances in the science and technology underpinning aviation weather support will enable evolution of CWSU products and services to make them more effective.

GAO Review of Aviation Weather Restructuring

Late last week we received the Government Accounting Office (GAO) Draft Report: "Review of Aviation Weather Restructuring." We are reviewing the draft and will develop our action plan once the final report is completed. We believe our response to the FAA for CWSU services addresses some of the key recommendations in the draft GAO report. For example, our response to FAA includes, as the centerpiece, a nine-month demonstration/validation. The planning, execution, and evaluation of this demonstration/validation will be overseen by the BASC to ensure involvement of stakeholders and an unbiased review to ensure no degradation of aviation weather services. The current 21 CWSUs will continue to operate during that period. Our response to FAA also highlights the importance of aligning organizational changes with NextGen initiatives. We have been working with our representative to the NextGen JPDO to ensure the NWS connection to NextGen. In addition, I serve on the JPDO Executive Weather Working Group, where I highlight important NextGen weather issues for discussion with other members of the board including representatives from the Department of Defense, FAA, and the National Aeronautics and Space Administration. Consistent with the GAO report, the NWS agrees there must be a linkage between the CWSUs and NextGen. I believe we have taken the necessary first steps to ensure this, and we will continue to incorporate NextGen concepts into our CWSU plans.

We also agree with the need to establish baseline performance measures, as stated by the GAO. NWS is now collecting data on four of the five standards developed by FAA and proposed by NWS, to establish a baseline. Methods by which to measure the fifth proposed standard (forecast accuracy) will be reviewed by FAA and NWS. These measures are critical data points to allow the BASC to evaluate the demonstration/validation and to determine its success. The FAA also recommended that NWS identify in our proposal additional performance measures that involve proposed products and services. To address this, NWS has identified eight additional performance measures which are listed in our response to FAA.

Conclusion

Much has changed since the CWSUs were first established in 1978. The science and our understanding and ability to observe, analyze, and predict the weather has improved tremendously; new technology to support our products and services continues to evolve. We believe a disciplined test of new service alternatives incorporating the best and newest science and technology has the potential to improve air traffic management and provide the capabilities needed in NextGen. We believe new 21st century technologies provide a viable option for remote weather support. We will support a change of the current operational model after a successful demonstration/validation shows no there would be no degradation in current services. The NWS mission is to provide weather forecasts and warnings for the protection of lives and property and enhancement of the national economy. We will not take any steps that would jeopardize our ability to deliver life-saving weather information. It is our goal to help the FAA ensure the National Airspace System remains safe, efficient, and cost effective for the people of this country.

BIOGRAPHY FOR JOHN L. "JACK" HAYES

John L. "Jack" Hayes is the National Oceanic and Atmospheric Administration (NOAA) Assistant Administrator for Weather Services and National Weather Service (NWS) Director. In this role, Dr. Hayes is responsible for an integrated weather services program, supporting the delivery of a variety of weather, water, and climate services to government, industry, and the general public, including the preparation and delivery of weather warnings and predictions, and the exchange of data products and forecasts with international organizations.

Dr. Hayes returned to the NWS in 2007 after serving as the Director of the World Weather Watch Department at the World Meteorological Organization (WMO), a specialized agency of the United Nations located in Geneva, Switzerland. In that position, he was responsible for global weather observing, weather data exchange telecommunications, and weather data processing and forecasting systems.

Before joining the WMO, Dr. Hayes served in several senior executive positions at NOAA. As the Deputy Assistant Administrator for NOAA Research, he was responsible for the management of research programs. As Deputy Assistant Administrator of the National Ocean Service (NOS), he was the Chief Operating Officer dealing with a multitude of ocean and coastal challenges, including the NOS response to the Hurricane Katrina disaster in August 2005. As Director of the Office of Science and Technology for the NWS, Dr. Hayes had oversight of the infusion of new science and technology essential to weather service operations.

Dr. Hayes was also an executive in the private sector and the military. He was General Manager of the Automated Weather Interactive Processing System (AWIPS) program at Litton-PRC from 1998 through 2000. AWIPS is the interactive computer system used by all weather service forecasters. From 1970 through 1998, Dr. Hayes spent a career in the United States Air Force. He held a variety of positions, culminating his career as the Commander of the Air Force Weather Agency in the rank of Colonel.

Dr. Hayes received both his Ph.D. and Master of Science degrees in meteorology from the Naval Post Graduate School in Monterey, California. A Fellow in the American Meteorological Society, he also graduated from Bowling Green State University, with a Bachelor's degree in mathematics.

Dr. Hayes has been married to his wife, Sharon, for over 37 years and has three grown children.

Chairman MILLER. Thank you, Dr. Hayes.

Mr. Day for five minutes.

STATEMENT OF MR. RICHARD DAY, SENIOR VICE PRESIDENT FOR OPERATIONS, AIR TRAFFIC ORGANIZATION, FEDERAL AVIATION ADMINISTRATION

Mr. DAY. Chairman Miller, Ranking Member Broun, Members of the Subcommittee, thank you for inviting me here to testify about the future of Center Weather Service Units.

Our job at the FAA is to oversee a safe and efficient National Airspace System. Reliable aviation weather forecasting is an integral part of that, and the National Weather Service's support has been a key component of that as well.

Our operations data tells us that 70 percent of air traffic delays are caused by weather. To address this problem we are collaborating with the National Weather Service on aviation weather forecasting and how to improve that forecasting to promote safety and reduce weather delays.

In our constant quest to improve aviation safety and efficiency, we are looking to capitalize on technological improvements that have emerged over the last 30 years since CWSU operations began. Technological improvements have changed the way in which weather information is generated, disseminated, and used.

In addition, we have also asked the National Weather Service to examine three different service methods. First, using the existing CWSU configuration, second, using a reduced number of CWSUs, and third, using one centralized facility to provide improved, consistent, and continuous weather service to centers 24 hours per day, seven days per week, versus the current 16 hours per day, seven hours—seven days per week service presently provided.

Since the Committee's last hearing on CWSUs, the National Weather Service responded to our request with three alternatives. Each of these had some innovative ways to meet our requirements. However, none were accepted because the costs were too high for each alternative compared to the cost of the program.

Last year the FAA advised the National Weather Service that we preferred the single weather center solution but recognized the need for backup and requested the National Weather Service refine its proposal. We were served—we received the National Weather Service revised proposal last month and expect to complete our assessment of the proposal in early August.

Although our assessment of the National Weather Service proposal is not complete, with a two weather center approach, we see an opportunity to improve aviation weather forecasting services in the near-term. We expect this approach to provide finer resolution and more consistent and accurate forecasts that will improve the safety and efficiency of traffic flows through the National Airspace System.

This consolidation—or, excuse me, this consolidated CWSU model would allow meteorologists to dynamically allocate resources to areas with active weather conditions having the most impact on aviation operations. We understand that there may be some concern about providing weather services remotely. I want to assure you that we have considerable experience with remote weather briefings. Today CWSUs provide remote support to Terminal Radar Approach Controls and select towers, just as Flight Service Stations provide remote weather briefings to pilots.

In addition, providing weather services using this model is consistent with centralized weather operations used internationally, by the Department of Defense, and by airlines. And CWSUs will not be the only source of aviation weather information for FAA's air traffic operations. The National Weather Service would continue to have approximately 130 meteorologists providing meteorological watch and issuing forecasts for parts of the National Airspace System from its weather forecast offices and the Aviation Weather Center providing both terminal and end-route forecasts.

In addition to the benefits we expect to see in the near-term, a two-weather center approach will also help aviation weather services towards the FAA's future needs envisioned in the Next Generation Air Traffic System or NextGen. One key concept of NextGen is a common operational picture of weather information for all air traffic management decisions. This concept is already being put into practice through the Collaborative Convective Forecast Product or CCFP. The CCFP provides a common operational picture of convective weather on which they build the air traffic management plan.

FAA and National Airspace System stakeholders now rely on the CCFP as the primary forecast product for NASS-wide operations planning during the convective season. Consistent with NextGen, we need a common operational picture of all weather elements that impact air traffic.

In conclusion, we are very hopeful about the benefits of the National Weather Service proposal. However, I want to assure the Committee that our assessment of the National Weather Service proposal is not the final consideration prior to implementation. Let me be clear. We will not change the current configuration until a demonstration and validation show that we are able to effectively disseminate the most timely and accurate weather forecasting for the safe operation of flights in our system.

This concludes my remarks, and I look forward to your questions.

[The prepared statement of Mr. Day follows:]

PREPARED STATEMENT OF RICHARD DAY

Chairman Miller, Ranking Member Broun, Members of the Subcommittee:

Thank you for inviting me here to testify about the status of Center Weather Service Units (CWSU). As this is my first opportunity to testify before this subcommittee, I would like to take just a moment to introduce myself. My name is Rick Day, and I am the Senior Vice President for Operations for the Federal Aviation Administration's (FAA) Air Traffic Organization (ATO). As Senior Vice President for Operations, I oversee the safe and efficient delivery of air traffic services provided by the FAA. My career with the FAA began 35 years ago as an air traffic controller at the Cleveland Air Route Traffic Control Center. I have first hand experience relying on CWSU forecasts so it is especially fitting that in my first appearance before you I will testify about the CWSUs and their future.

The FAA has had a longstanding, productive relationship with the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS). We want to continue to this relationship with a renewed focus of improved aviation weather forecasting.

A little history of our working relationship may be helpful. Aviation weather forecasting services have always been integral to safe and efficient operations within the National Airspace System (NAS) and support from the NWS has been key. The formal arrangement by which the NWS now provides aviation weather services to the Air Route Traffic Control Centers (ARTCC)[1] originated with the NTSB recommendation issued on October 28, 1977, following its investigation of the crash of Southern Airways Flight 242. The NTSB recommended that FAA develop rules and procedures for the timely dissemination by air traffic controllers of all available severe weather information to inbound and outbound flight crews in the terminal area. To address this recommendation, the FAA entered into an Interagency Agreement with the NWS, to create CWSUs at each FAA ARTCC.

Today, CWSUs are located at each of the FAA's 21 ARTCCs throughout the United States. They are staffed by 84 NWS meteorologists, 16 hours a day, seven days a week. Typically, the CWSU forecaster on duty works with the ARTCC Traffic Management Unit (TMU), providing two scheduled weather briefings and updates throughout the day. The CWSU forecast is used in the development of the operational plan for air traffic, including runway configurations and routing traffic around significant weather.

The original Interagency Agreement with the NWS that established the CWSUs has been renewed a number of times since it was first entered into in 1978. The current agreement will expire in September of this year but we expect to execute the agreement's one-year extension option to continue the existing CWSU operations through September 2010.

Over the last several years, the FAA has been exploring opportunities to improve safety and efficiency within the NAS and capitalize on technological improvements that have emerged over the last 30 years since CWSU operation began. Technological improvements have changed the way in which weather information is generated, disseminated and used. In addition to the change in technology, we found that the CWSUs were not providing the same level of services at all of its locations, and the services and forecasts were not standardized across the 21 locations. There was also little collaboration or communication between the different CWSUs. In addition, neither the FAA nor the NWS had a formal quality assurance program for

[1] ARTCCs provide air traffic control services to aircraft operating on instrument flight rule (IFR) flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to visual flight rule (VFR) aircraft.

CWSU products and services. To this end, in 2005, the FAA asked the NWS to examine different service methods to provide improved, consistent and continuous (24 hours per day, seven days per week) weather support to ARTCCs. In response to this request, the NWS submitted a restructuring proposal in October 2006. In April 2007, the FAA declined this proposal because we were in the process of an internal requirements review. We completed that review in late 2007.

Following this review, we refined our requirements for services provided by the CWSUs because our existing requirements were too broad to ensure the efficiency and cost effectiveness of the services. Also, as GAO found, FAA did not have a system in place to gather information about the effect of forecasts on delays and diversions in the NAS.

In December 2007, the FAA asked NWS to provide a new proposal based on more narrowly tailored requirements for the future weather forecasting needs and the need for performance evaluation. Our requirements included 24-hour, seven-days-a-week staffing, standardized services to promote consistency in service delivery across the NAS as well as NAS-wide monitoring and a new Terminal Approach Control (TRACON) forecast that provided higher resolution information for 10 of our busiest TRACONs. The FAA also asked that NWS outline three different service methods to meet these requirements using: (1) the existing CWSU configuration at 21 ARTCCs; (2) a reduced number of CWSUs; and (3) one centralized weather facility. NWS responded with three proposals, each of which had some innovative ways to meet our requirements, however we did not accept any of them because the costs were too high for each alternative compared to the current cost of the program.

In September 2008, the FAA advised the NWS that we preferred the single weather center solution but recognized the need for back up and requested the NWS refine their proposal. Safety and efficiency have always been and will continue to be the driving forces behind any improvements to the CWSU service. We received the NWS revised proposal last month. Currently, the FAA has a team assessing the proposal and we expect to have the assessment completed in early August.

Although our assessment of the NWS proposal is not complete, with a two weather center approach, we see an opportunity to improve aviation weather forecasting services in the near-term. The agency expects the two center approach to provide finer resolution and more consistent and accurate forecasts that will improve the safety and efficiency of traffic flow through the National Airspace System 24 hours a day versus the 16 hours currently covered. This consolidated CWSU model would also allow meteorologists monitoring the NAS to dynamically allocate resources to areas with "active" weather conditions, having the most impact on aviation operations.

We understand that there may be some concern about providing weather services "remotely." We think this concern is unfounded because we have considerable experience with remote weather briefings. Today, CWSUs provide remote support to TRACONS and select towers just as Flight Service Stations provide remote weather briefings to pilots. In addition, providing weather services using this model is consistent with centralized weather operations used by NavCanada, Eurocontrol, and the U.S. Department of Defense as well as the airlines.

Further, CWSUs will not be the only source of aviation weather information for FAA's air traffic operations. NWS would continue to have, at any one time, approximately 130 meteorologists providing meteorological watch and issuing forecasts for parts of the NAS from its weather forecast offices and the Aviation Weather Center providing terminal and en route forecasts.

The current requirements for the CWSUs to provide "consistent" information will also help move aviation weather services towards the FAA's future needs envisioned for the Next Generation Air Transportation System or NextGen. One key concept of NextGen is a common operational picture of weather information for all air traffic management decisions. This concept is already being put into practice through the Collaborative Convective Forecast Product (CCFP). Several years ago we asked the NWS to develop and provide the CCFP based on user feedback that there were several convective forecasts available, often providing different answers. FAA needed a "common operational picture" of convective weather on which to build the air traffic management plan. The CCFP provides this common forecast of convective weather. It is developed from collaboration among meteorologists from CWSUs, the Aviation Weather Center, Meteorological Service of Canada, and the airlines. FAA and NAS stakeholders now rely on the CCFP as the primary forecast product for NAS-wide operations planning, during the convective season. Consistent with the NextGen Concept of Operations, we need a common operational picture of all weather elements that impact air traffic.

In the time since the GAO's January 2008 evaluation of weather services provided by CWSUs, we have taken steps to address GAO's recommendations for establishing standards by which to evaluate CWSU performance. We have already established standards for participation in the development of the Convective Forecast, when convective weather is expected to occur within that specific ARTCC domain; consistency of CWSU product formats, information content, and procedures for issuance, across all CWSUs; and, provision of on site or back up daily services 16 hours per day, seven days per week. We began baselining these performance standards with the NWS during site evaluations we started this year. We have also established a standard for accuracy of forecasts used in decisions for traffic management initiatives. The metric that results from this is being developed jointly by FAA and NWS. This metric will take a little more time to refine, but we believe that building on a developing tool called the Weather Impact Traffic Index, which translates weather and weather forecast impact on air traffic, will help us in these efforts.

As I mentioned, the NWS and the FAA are also in the process of conducting a new series of site evaluations. As of June, we had evaluated 13 of the 21 CWSUs and expect to complete the remaining site evaluations by September. So far, we have found what previous FAA, NWS and GAO reports have documented: a lack of standardization in CWSU services. Having said that, we have also found that CWSUs are well integrated into air traffic management operations. We have also found positive dividends from new FAA and NWS initiatives. Specifically, NWS has provided all CWSUs with a common tool set—standardized technology, collaboration and training—which is producing improved and consistent service. The FAA has funded a hardware and software technology upgrade of the AWIPS Remote Display (the standard meteorological workstation used by the NWS) which has improved system performance and weather information availability because it provides faster, more effective manipulation of forecast data.

In conclusion, we are very hopeful about the benefits of the NWS proposal. However, I want to assure you that our assessment of the NWS proposal is not the final consideration prior to implementation. Let me be clear—we will not change the current configuration until a demonstration and validation show we are able to effectively disseminate the most timely and accurate weather forecasting for the safe operation of flights in our system.

We will work with the NWS to plan, execute and evaluate the demonstration and validation to prove whether the consolidated CWSU model will be able to provide on-demand services remotely. In addition, we understand that the Board on Atmospheric Sciences and Climate of the National Academy of Sciences has agreed to oversee the demonstration and validation, providing an independent assessment of the consolidated CWSU model. We also expect the NTSB to contribute to the demonstration and validation by participating in the independent review. Finally, during the demonstration and review, we expect to develop the data necessary to assess, in quantitative terms, the improvements we have identified.

We have an opportunity to couple the art and science of aviation weather to reduce the impact weather has on aviation and increase the safety of operations. FAA and NWS will continue to learn and grow together as we move towards our common goal of improved aviation weather services.

Chairman Miller, Ranking Member Broun, Members of the Subcommittee, this concludes my prepared remarks. I would be happy to answer any questions at this time.

BIOGRAPHY FOR RICHARD DAY

Rick Day was named the Senior Vice President for Operations in September 2008. In this capacity, he is responsible for leading all segments of Operations—Terminal, En Route, Systems Operations and Technical Operations—and representing those service units on the Executive Council. Operations also directs the Office of Technical Training and Office of Service Center. In addition, Day will work to help Operations prepare for the transition to the Next Generation Air Transportation System.

From 2005–2008, Day served as Vice President of En Route and Oceanic Services. He was responsible for providing air traffic services that met customer target levels of safety, efficiency and security in the national airspace system and international airspace assigned to U.S. control. He also concentrated on bolstering ties with civil aviation authorities to promote harmonization and cooperation as the world moves to the Next Generation Air Transportation System.

Day joined the Federal Aviation Administration in 1974, beginning his career as an air traffic control specialist at Cleveland Air Route Traffic Control Center. He eventually moved to the Central Region and Great Lakes Region where he served as Manager of the Kansas City ARTCC. He held various branch and staff manager positions, before serving as Assistant Air Traffic Division Manager for three years. He later served as acting Regional Administrator.

He also spent time as an instructor/evaluator at the Mike Monroney Aeronautical Center following the PATCO strike from 1980–1984.

In 2001, Day became Manager of the Air Traffic Division of the Federal Aviation Administrations Southern Region in Atlanta, eventually serving as Area Director for Eastern En Route and Oceanic Operations in February 2004.

In March 2005, Day was selected as Vice President for En Route and Oceanic Services. He leads nearly 9,000 employees supporting 47 million operations a year over more than 5.6 million square miles of airspace in the U.S. and 24.6 million square miles of oceanic airspace. This domain equates to more than 15 percent of the world's airspace.

Day holds a Bachelor's degree in management from Mid-America Nazarene University. He chartered and was the first President of the Kansas City Metropolitan Chapter 293 of the Federal Managers Association.

Day lives with his wife, Jill, in Springfield, Va.

DISCUSSION

Chairman MILLER. Thank you, Mr. Day. We will now begin our first round of questions. I now recognize myself for five minutes.

INVOLVEMENT OF AIR TRAFFIC CONTROLLERS IN REFORM

Again, I understand based upon our staff interviews and other information that the air traffic controllers strongly support keeping meteorologists where they are in the regional air traffic control centers where they can stand over their shoulder in times of weather crisis.

Mr. Day, since the air traffic controllers are the consumers, the customers for the weather services, what role have they played in developing this proposal for the consolidation of services?

Mr. DAY. The air traffic controllers have not had a central role in developing the requirements for those services, however, there has been assessments ongoing between the FAA and the National Weather Service going out and reviewing the services currently provided in Center Weather Service Units. And as I understand, they have gotten feedback from the Center Weather Service employees, as well as the controllers on those assessments.

Chairman MILLER. Would those be the CWSU's site reviews? I think we have now gotten a copy of.

Mr. DAY. Yes, sir, and there has been 13 completed out of the 21 sites.

Chairman MILLER. My understanding is that in every case the view of the air traffic controllers is they like things the way they were a whole lot better than the proposed change. Is that correct?

Mr. DAY. This is change, and having been a controller many years ago, I have gone through a number of technological changes, and oftentimes I would resist those changes because I felt comfortable with the tools and the assets and the advice around me. And our controllers are the same way, and we have done a number of technological changes, and what we often find is after we introduce the change safely and we work to resolve concerns, we oftentimes find that—in most cases we find that they—it is hard to pry the new technology from their hands.

We also find that our new controllers, the 'NextGen-ers' and 'Gen X-ers' really do embrace technology, and they are actually pushing us to continue to look for new technologies and new ways to do business.

So we do find that while—and we do understand resistance to the change, we do want to address their concerns and feel that as we work through a successful demonstration and validation process, which would include their involvement and feedback, we will resolve those concerns and come up with a much superior service than we have today.

THE EFFECTS OF REDUCING THE NUMBER OF METEOROLOGISTS

Chairman MILLER. I understand the consolidation proposal would require at least a 60 percent reduction in the staffing of meteorologists during the heaviest traffic hours. Understanding that there is continuing new technology and we certainly want to overcome resistance to using new technology where it does actually improve weather forecasting, will the reduction by 60 percent of the people, the forecasters, not have some significant effect on the quality of the forecasting? Will the skies really be as safe if there are eight forecasters on duty as opposed to 20?

Dr. Hayes.

Dr. HAYES. Well, I would say that our—any—on any given day we don't have significant weather affecting aviation covering the entire United States, and so in our existing structure we have people who are monitoring areas where there is no significant weather, and our consolidation plan is really to reduce the number of employees involved in this from 84 to 50. We will have eight people, and our plan here is actually to put more eyes on where weather has an impact on aviation in our proposal.

So it is our view that we will actually increase the attention that we are putting on weather that has an impact on aviation safety.

Chairman MILLER. Okay, and I suppose it is also true that on most days firefighters have the easiest job in America.

SAFETY AND POTENTIAL DEGRADATION OF SERVICE

Mr. Powner, do you have a comment on that?

Mr. POWNER. Well, clearly, these are all very fair questions, Mr. Chairman. I think the rubber is going to meet the road on the demonstration project. I mean, the key here is to demonstrate no degradation of service, and you know, and not having that face-to-face, on-demand consultation is a concern. We heard that during the course of our work also, and we really won't know that until we have that demonstration in place.

And, again, I would like to reiterate that demonstration is going to be very difficult because as we heard here, we still have performance measures to agree to in terms of what we are measuring, and then once we get those in place, then we have to baseline those so that we have baseline performance to measure against.

It is tough to demonstrate no degradation of service if you do not have baseline performance metrics.

Chairman MILLER. Okay. My time has expired.

Dr. Broun for five minutes. Ranking Member and licensed pilot, Dr. Broun.

Mr. BROUN. Mr. Day, are you a pilot?

Dr. Hayes, are you a pilot?

Dr. HAYES. No, sir, I am not.

Mr. BROUN. Mr. Day, I have used Atlanta Center. I flew out of Athens, Georgia, for a long period of time and then I flew out of South Georgia a long period of time and worked out of Jack Center or flying into Atlanta Center a lot, and I appreciate your centers' good service that I have gotten.

But I want to make a statement. As a pilot, instrument-rated pilot, frequently I would be talking to a controller at a center and would talk to the controller about what weather I was facing, and this is—we would fly at night as well as in the daytime. And just to make a statement to begin with, I don't like this change as a pilot, that you are proposing, and I think it is not going to be a good change for pilots.

I think it is—and the reason I say that is because frequently I have talked to the center controllers and asked about weather—and have talked to a National Weather Service specialist in the center about what I was dealing with. Trying to consolidate that and working with the controller that was handling my aircraft at the time, being pilot in command, talking to the controller, talking to the Weather Service specialist trying to figure out the safest way for me and my aircraft and frequently passengers to traverse through a weather system, I think it is absolutely critical for pilots to have that ability.

So my change that I would suggest as a pilot to FAA is to—let us go to a 24/7, 52 weeks out of the year service with somebody in each control center and not trying to consolidate these things. I think it is absolutely critical.

Now, Mr. Day, have you all at FAA consulted AOPA about their opinion about this change that you all are proposing?

Mr. DAY. We have had conversations with AOPA[1] just like we had with the flight service consolidation and the many pilots like yourself, oftentimes they do want that comfort of having face-to-face briefings or assets available, and what I would say, because I used to work down in that area, and I have been to all those facilities, including Athens Airport, the CWSU forecasting is not the only product.

You know, as a controller they have the corridor information or corridor information weather service services, as well as an integrated terminal weather services——

Mr. BROUN. Mr. Day, let me interrupt you because my time is very limited. I understand all that, and I understand that we are still going to have towers as well as approach and departure control help on that, but there is a lot of territory in Georgia, Florida, South Carolina, North Carolina, Tennessee, Alabama, Mississippi, Texas, Louisiana that I have been flying in that is not covered by a tower, it is not covered by a terminal radar. It is covered by the Center, and I have talked to those weather specialists, and I have—it is not about having the comfort.

It is about having safety, and I think it is absolutely critical to have those specialists in the Centers to be able to talk to those folks and talk to a controller with the weather specialist looking over their shoulder so I can talk to both of them at the same time.

[1] Aircraft Owners and Pilots Association

And I think you all, just as the Chairman said in his opening statement, and I really appreciated his opening statement, I think you all are looking for solutions for a problem that is not broken.

I would like to see you guys go to 24/7 personally. I think that is going to be the safest way. You know since you worked in the Atlanta control, Atlanta Center that we have a lot of thunderstorms. Daytime, nighttime. I need as a pilot to know where those are and how to circumnavigate them. And talking to somebody in Silver Springs, Maryland, with a controller being in Hampton is not going to get it as far as I am concerned.

I like technology. I want to stay on the cutting edge of technology, but I think you all are—you have no metrics to measure what is going on today. You have no possibility of determining what is going on from the National Weather Service absolutely providing the services that the pilots desperately need in operating a safe aircraft in the Air Traffic Control System, and I think until we have the metrics in place, until we have all the things that are absolutely necessary to make sure that we continue in a safe manner and operate in the air traffic control system, I think you are premature in just jumping out and trying to do what you are doing.

Now, my time is just about expired. Mr. Chairman, you have been very gracious in allowing some variance on time. Dr. Hayes, I have got a question for you very quickly, because my time is up, and the Chairman is being very gracious to offer me some extra time.

Can NOAA provide weather specialists in the centers to give—to use all the technology that is available to help us as pilots to provide safe travel within the center structure? Can you all do that and do it in a cost-effective manner and utilize all the technology?

Dr. HAYES. Mr. Broun, are you referring to Centers as currently configured today or in the proposed——

Mr. BROUN. No. I am talking about in Centers as they currently are configured today.

Dr. HAYES. And the answer is an unqualified yes.

Mr. BROUN. Okay.

Dr. HAYES. I think our view is that the system works well today, but it needs to work better. There are challenges we face, and as you look to the future of aviation in the United States, the demands for air traffic management are only going to grow, and weather, as you noted, being a significant impact on traffic, is going to grow in its importance.

We need to bring to bear new science and technology. We need to improve the consistency of our forecasts. These are part of what causes some of the delays you experience. I want to assure you I am committed to enhancing the services that we provide to the FAA. I am—and I am also committed to doing it in a way that ensures safety.

So I have responded to their requirement because I believe that what they are asking is viable, and I have a responsibility since I am the service provider to test what I consider to be scientifically-viable solutions, have an objective, independent, third-party evaluate, and if there is any concern about degradation, then there is no commitment on our part to move forward.

Thank you.

Mr. BROUN. I appreciate the great services you all provide.

My time is up. Thank you, Mr. Chairman.

Chairman MILLER. Thank you, Dr. Broun.

Ms. Dahlkemper.

Ms. DAHLKEMPER. Thank you, Mr. Chairman.

I guess I want to piggyback on what we were just talking about, but as you were talking about the conclusions regarding the CWSU baseline performance, are they going to be evaluated by the National Academies? Dr. Hayes, Mr. Day, one of you.

Dr. HAYES. Our plan with the involvement in the National Academies is that they will bring together the expertise and that will be involved in looking at the plan, looking at the metrics we have, overseeing the execution of the dem/val, evaluating the results, and again, part of their evaluation, if there is any concern with the baseline metrics that we have, whether they are strong enough, whether the execution is strong enough to indicate that there is no degradation, we expect them to tell us that.

In addition, internally I have a responsibility to the American people that every step of the way I evaluate our internal processes, and if I see something that they don't see, I have a responsibility to say, hold everything. So I think there is a dual aspect to this evaluation, both external and internal.

Ms. DAHLKEMPER. Will all the metrics that are proposed by the recent GAO strictly be adopted in that?

Dr. HAYES. I think we have got four of them in work, in implementation today. We are looking at forecast accuracy. We are working with the FAA, and we hope to have that soon, and I would say that if there are additional metrics, again, our intent here is not to cut any corners with regard to safety of air flight and our services.

Thank you.

Ms. DAHLKEMPER. Mr. Powner, when FAA rejected the second NWS proposal for consolidation, they stated that they believe the technology has moved to a point where face-to-face communication between forecasters and air controllers is not needed. Given your experience looking at the technology acquisitions in use in federal agencies, are there risks in this approach that relies on technology to fill in for direct human contact?

Mr. POWNER. Well, clearly the on-demand consultation you can't put in—there are technologies to put in place, you know, with various communication mechanisms. We could have that—I will tell you, though, during the course of our review we actually visited four centers, and three of the four preferred to move forward with a face-to-face, on-demand consultation. So I still think that is the mode that most folks are comfortable with. I think the technology when you want to continue to pursue that, I think that what we are talking about here is consistent with where FAA is going with their longer-term NextGen initiatives where you do more remotely, not just weather but other things associated with air traffic control.

So you want to continue to push that, but, again, you want to make sure—you need to listen to the users, and you want to make sure there is no degradation of service.

Ms. DAHLKEMPER. And I guess I just want to go back to Dr. Hayes and Mr. Day and, again, kind of piggyback on what has already been asked.

I guess what is it that we are trying to fix through this consolidation? Exactly what is it we are trying to fix, because there seems to be unanimity among meteorologists that this—they are a necessary part of this safety team. So what is it that we are trying to fix?

Mr. DAY. Thank you. So first of all, through evaluations by both the GAO as well as our site visits and from customer feedback we lack the consistency and accuracy of our forecasts, and as—what we have seen is that many times our very competent and committed meteorologists provide a regional view, however, that becomes murky as you look at a National Airspace System and a common operational picture by which to make mission-driven decisions and ensure safety and a successful mission.

So we believe that by moving to this new model we can resolve some of those inconsistencies and accuracy like we realize with the CCFP product for convective weather.

Ms. DAHLKEMPER. Dr. Hayes, did you want to comment on that?

Dr. HAYES. I would say that I have seen evidence in the past 18 months since I have been in the job where we have some challenges with consistency. FAA identified an impact three weeks ago in the New York City area where our weather forecast office Terminal Aerodrome Forecast was inconsistent with the CCFP product, and so we are taking action now to address that.

And that will be part—and that is part of our response, is to focus on a consistent message to air traffic controllers. I mentioned in my opening——

Ms. DAHLKEMPER. And that can't be done in the current system that we have right now? The consistency issue can't be fixed?

Dr. HAYES. No. It can. It can be with the existing system.

Ms. DAHLKEMPER. It can be or it cannot?

Dr. HAYES. It is. There are challenges there that we would have that we wouldn't have with fewer locations. Obviously the more people in the message generation, the more difficult it is to ensure consistency.

Ms. DAHLKEMPER. Okay. My time has expired. I yield back.

Chairman MILLER. Thank you, Ms. Dahlkemper.

My current plan is to represent Mr. Lipinski for five minutes of questions, and at that point we probably need to go to vote, so we will be gone for votes for a sufficiently long time. It does not make sense to come back, so Mr. Lipinski for five minutes.

Mr. BROUN. Mr. Chairman, I would ask for unanimous consent to enter into the record a statement from the air traffic controllers, from the Weather Union folks, as well as AOPA?

Chairman MILLER. That would be fine.

Mr. BROUN. Thank you, Mr. Chairman.

Chairman MILLER. It is so ordered.

[The information follows:]

Press Releases

NATCA DENOUNCES COMMERCE SECY. DECISION TO ADVANCE PLAN TO CLOSE WEATHER SERVICE UNITS AT REGIONAL FAA CENTERS

06/04/2009

WASHINGTON – The nation's air traffic controllers today are strongly denouncing Commerce Secretary Gary Locke's decision to move forward with a controversial plan to close the National Weather Service Center Weather Service Units (CWSUs) located at each of the 21 FAA regional en route centers and consolidate the service into two facilities in Maryland and Kansas City.

Said NATCA President Patrick Forrey: "This is a foolish plan that puts cost savings ahead of safety. Quite frankly, we cannot believe such a reckless idea has gotten this far. The public needs to know that if put into place, this plan would directly and negatively affect the margin of safety for the air traffic control system."

Currently, National Weather Service meteorologists are stationed in weather forecast units inside each one of the FAA's Air Route Traffic Control Centers (ARTCC) – called en route centers for short. This system was put in place in 1978 as a result of a recommendation made by the National Transportation Safety Board. The FAA's inability to quickly disseminate information regarding hazardous weather to flight crews was found to be a major contributing factor in the 1977 crash of a Southern Airways DC-9 in New Hope, Ga.

If the Department of Commerce's plan is implemented, air traffic controllers will no longer have the immediate expertise of an on-site meteorologist to advise them where to route aircraft experiencing difficulty when weather conditions play a critical role in that decision. Therefore, NATCA and the National Weather Service Employees Organization (NWSEO) are urging an end to this plan due to both organizations' concern that the flying public will be at risk if controllers are suddenly unable to quickly send hazardous weather information to flight crews.

"As our NATCA facility representative at Fort Worth Center, Russ Miller, has said, this is the kind of ill-conceived cost-savings that turns out to be tragically expensive the day after a disaster," Forrey said. "There is absolutely no good or sensible reason to end what has been a key part of our ability to call our system the world's safest. None whatsoever."

NATCA representatives at en route centers nationwide have been outspoken in their opposition to the plan over the last several months. To view their press releases, please see the list below.

Latest Press Rele

- Saturday, June 1 SHOESTRING E MAJOR WASHI RADAR FACILIT CLOSURE OF B RALEIGH TRAF AFFECTED
- Friday, June 19 FAA CREATES STAFFING PRC UNWISE SPLIT TOWER/RADAR
- Friday, June 12 UTAH CONGRE DELEGATION A DELAY IMPLEM ERAM, CITING CONCERNS

Highlighted Links

- Links
- Frequently Aske
- Region X Inform
- Learn about NAT Stress Managem

rather than considering proposals to obtain meteorological support for the ARTCCS from off-site."

More information about the FAA's plans to consolidate CWSU can be found at www.nwseo.org

- NWSEO-

Media contact:
Dan Sobien, President NWSEO, 202-420-1043
Richard Hirn, General Counsel 202-274-1812 or 202-255-3141

JUNE 2009

The Four Winds

National Weather Service Employees Organization

National Weather Service Proposes Risky Plan to FAA to Close Weather Offices at Air Traffic Control Centers – NWSEO Says Air Traffic Safety at Risk

National Weather Service Deputy Director Vickie Nadolski announced today that NWS is moving forward with its controversial plan to close the nation's CWSUs. If adopted this plan would end the real time, face-to-face. weather guidance to the air traffic controllers and air traffic management supervisors at each ARTCC, the same face to face service the NWS is trying to emulate with its plans for expanded decision support services. The NWS proposal would have forecasts from two central units located in Maryland and Kansas City.

NWSEO has vehemently opposed the consolidations of CWSUs and has actively voiced concerns to public officials, media outlets and its members regarding the safety implications for air travelers.

A copy of the press release sent to the media by NWSEO follows:

Commerce Secretary Approves Plan to Close Weather Offices at Air Traffic Control Centers: Move Will Endanger Traffic Safety, Forecasters Union Says

WASHINGTON D.C. (June 4. 2009) – The Department of Commerce announced today that it is moving forward with controversial plans to close the National Weather Service Center Weather Service Units ("CWSUs") located at each of the 20 Air Route Traffic Control Centers (ARTCC) in the continental United States. These forecast units provide real time, face-to-face, weather guidance to the air traffic controllers and air traffic management supervisors. The NWS has offered to send the FAA forecasts from two central units located in Maryland and Kansas City instead. The proposal was developed by the NWS in response to an FAA request to cut the cost of the CWSU program, which is funded from the FAA budget.

"If DOC's plan is implemented, air traffic controllers will no longer have the immediate expertise of an on-site meteorologist to advise them where to route aircraft experiencing difficulty when weather conditions play a critical role in that decision," said Dan Sobien, President of the National Weather Service Employees Organization. NWS forecasters at the ARTCCs routinely provide emergency assistance to aircraft that have lost instrumentation during bad weather. Sobien noted.

Under the plan approved by Commerce Secretary Gary Locke, who oversees the NWS, only the "lead forecaster on duty" will be available at each of the two consolidated CWSUs nationwide as a point-of-contact to support to ten ARTCCs at a time. He or she will provide emergency support by instant messaging or telephone rather than face-to-face, and may be unavailable due to competing demands from other ARTCCs. Currently, each ARTCC has a dedicated forecaster on duty on-site.

New York Senior Senator Charles Schumer is outspoken about how the consolidation would affect flight safety at New York's airports. As posted on his web site, Senator Schumer said, "Our airspace and airports are the most complex and congested in the world and to move the local experts away is simply penny wise and pound foolish. The bottom line is the FAA's consolidation plans could compromise air travel safety and reduce the efficiency of travel in New York City and we simply cannot allow that to happen."

The Commerce Department's consolidation plans ignore the findings of a January 27, 2006 study of the CWSUs conducted for the FAA by Booz-Allen. The report concluded that all seven ARTCCs that participated in the study desired to retain an on-site CWSU and face-to-face interaction with meteorologists rather than rely on remote briefings.

On April 18, 2007 Senate Commerce Committee Chairman Inouye wrote the FAA Administrator a letter opposing consolidation plans because the Committee "has grave concerns over the safety and wisdom of removing meteorologists from the ARTCCs." Senator Inouye wrote that "the Committee believes that the FAA should focus its efforts on working with the NWS to enhance the services provided by its meteorologists in situ, rather than considering proposals to obtain meteorological support for the ARTCCS from off-site."

More information about the FAA's plans to consolidate CWSU can be found at www.nwseo.org.

Media contact:
National Weather Service Employees Organization
Dan Sobien, President NWSEO, 202-420-1043
Richard Hirn, General Counsel 202-274-1812 or 202-255-3141

AOPA

Plan to oust center meteorologists a bad idea

AOPA wants weather forecasters at ARTCCs

By Thomas A. Horne

The FAA is planning to consolidate and reduce the number of meteorologists in air route traffic control centers (ARTCCs). Currently, these meteorologists serve in the center weather service units (CWSUs) of each ARTCC, lending their expertise and local knowledge to controllers in high-workload periods when adverse weather prevails.

AOPA has sent a letter to FAA management detailing the association's concerns with this proposal.

"There still exists an intrinsic, safety-based value in having an onsite NWS meteorologist at the ARTCC facilities. In order to capitalize on these benefits and maximize their use in today's air traffic environment, it may be necessary to redefine the role of the meteorologists and the way they interact with the air traffic controllers," Randy Kenagy, AOPA acting vice president of regulatory affairs, said in a letter to Nancy Kalinowski, the FAA's vice president of systems operations services.

"According to the FAA's 10-year strategy for the Air Traffic Control Workforce 2008-2017, the FAA plans to hire nearly 17,000 new controllers. These controllers will not have the same knowledge or historical understanding of local area weather patterns to draw on, compared to the controllers they are replacing," Kenagy continued.

AOPA will be following this issue closely and will continue to engage the FAA to ensure the situation is resolved favorably.

Chairman MILLER. Mr. Lipinski.

Mr. LIPINSKI. Thank you, Mr. Chairman. I want to thank Chairman Miller and Ranking Member Broun for, both of you for holding this important hearing and for allowing me to join in on the Subcommittee here this morning.

As some of you may know, Midway Airport is in my District, and O'Hare is close, and air traffic safety is very important to me. I have been following this proposed consolidation with increasing concern.

A little over a month ago we had Administrator Babbitt in before the Transportation and Infrastructure Committee's Aviation Subcommittee, and I was asking him questions that we have—are focusing on here this morning. Unfortunately, he had just gotten into that position and at that time he really didn't have much to tell me. He said he hadn't had a chance to review the latest version of the NWS proposal. So I am hoping that today with this very helpful GAO report we can get a clearer picture.

I have a lot of questions here. Let me try to focus, and I will have some questions for the record, but focus in on two if we have time.

Dr. Hayes, the meteorologists who currently work the 21 CWSUs have developed very precise knowledge of how weather patterns have emerged in each area. During the test phase of the consolidated program how do you intend to staff this new consolidated center? If, for instance, you were taking some of the most senior people out of the existing 21 centers, how can you fairly and accurately evaluate the current system versus a new proposal? And what will become of the meteorologist at the existing CWSUs if consolidation occurs?

Dr. HAYES. For staffing the dem/val, Mr. Lipinski, our plan is to not take the people out of the existing CWSUs. Our plan is to take aviation weather expertise out of our Science and Operations Officers at our Weather Forecast Offices. Some of our meteorologists in charge will staff the dem/val sites so that we do have, I think, a fair and objective comparison of 'as is' versus 'to be.'

Mr. LIPINSKI. Do you see any problem with the difference in experience that you will have at the—comparing two different, the two different systems?

Dr. HAYES. Actually, I think if it biases it at all, it would bias it toward the as is today because that is where the aviation experience is today. And so, no, I don't think that it is an unfair comparison.

Mr. LIPINSKI. So what happens with the meteorologists at the existing CWSUs?

Dr. HAYES. Well, we would offer them a job elsewhere if they were, if we were to reduce or to eliminate that CWSU and offer them a job ideally at one of the two that we are going to—that we have proposed, and if we also have vacancies at nearby Forecast Offices, and we would attempt to offer them opportunities.

One other aspect of the proposal that we put forward that we think will enhance its attractiveness to members of our CWSU staff is to raise the GS grade of aviation weather forecasters, and I think what this will in a long-term create an aviation career opportunity that they don't have today.

Mr. LIPINSKI. Okay. I just want to—I don't have much time here. I would quickly move onto the second question for Dr. Hayes, and on May 9, 2008, when the National Weather Service sent the FAA's latest consolidation proposal, you accompanied the proposal with a transmittal letter that included some language which concerned me. You wrote that, "The non-remote option expands and improves CWSUs' services at the 21 current locations. This option sustains the capability to provide face-to-face decision support, which reduces risk when rapidly changing weather has a potential for first order impact on aviation.''

I think we can all agree that if the proposal increases the risk relative to the current system, that it is not going to be acceptable. There are two things I want to understand.

First, what did you mean by ''first order impact'' on aviation, and second, how could a new system with less local weather knowledge possibly reduce risk? And haven't the air traffic controllers spoken out in favor of keeping the forecasters co-located?

Dr. HAYES. Well, I think, Mr. Lipinski, when you are trying to communicate, one has to say that face-to-face does lessen risk, whether it is a significant reduction or—I don't think I can categorically say one way or the other. There is—it just depends on the situation.

I guess my position is and has been that I think that what the FAA has asked me to do is viable, and I am willing to test it and then see what the results show with an independent evaluation.

Mr. LIPINSKI. How much of an increase in risk are we going to allow?

Dr. HAYES. Well, again, the risk is to communicating what we intend. Whether that risk translates into an impact on safety or not, I don't, again, I don't think I can say.

Mr. LIPINSKI. Okay. I have some more questions for the record, but I know that we don't have much time here, and so I will yield back.

Chairman MILLER. Thank you, Mr. Lipinski, and the record will remain open for three days, three legislative days for records.

We have provided to the minority a list of documents, and I now move or ask unanimous consent that they be entered into the record. Without objection, so ordered.

[The information appears in *Appendix 2: Additional Material for the Record*.]

Chairman MILLER. Under the rules of the Committee the record will remain open for two weeks, excuse me, for additional statements from the Members and for questions for follow up and for answers to any follow-up questions that the Committee may submit.

And it certainly appears based on today's testimony that by the time we have developed a reasonable, careful criteria for the dem/val for determining whether the new procedure is the equal of the old, NextGen will be here, and playing out the clock may not be such a bad thing.

And with that the hearing is adjourned. The witnesses are excused.

[Whereupon, at 11:57 a.m., the Subcommittee was adjourned.]

Appendix 1:

ANSWERS TO POST-HEARING QUESTIONS

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00061 Fmt 6601 Sfmt 6601 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

ANSWERS TO POST-HEARING QUESTIONS

Responses by John L. "Jack" Hayes, Assistant Administrator for Weather Services; Director, National Weather Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce

Questions submitted by Representative Daniel Lipinski

Q1. Mr. Powner's GAO report stated that "It is important to obtain an understanding of the current level of performance in these measures before beginning any efforts to restructure aviation weather services." If we cannot quantify how the current Central Weather Service Units (CWSUs) are working, I do not understand how we can rigorously compare them to the proposed consolidated centers. How can you design a reliable test when you cannot even characterize the control in your experiment? What steps are you taking to quantify current CWSU performance, and how well do those steps capture differences due to local weather patterns?

A1. In February 2008, the GAO recommended NWS ". . . perform annual evaluations of aviation weather services provided at en route centers and provide feedback to the Center Weather Service Units." In response to this recommendation, the NWS developed and implemented the CWSU Site Review Program in January 2009. These documented site reviews assess the current level of performance at each of the Centers (including local aviation weather support) through observation, interaction, and dialogue. In addition, the review includes interviews with FAA representatives to assess CWSU performance and determine how well NWS meteorologists are addressing FAA weather concerns. By September 2, 2009, a total of 18 site reviews will have been completed.

We continue to gather data on CWSU performance using performance metrics identified in the GAO report. These metrics will provide a baseline for performance metrics for each CWSU and will be available prior to the demonstration/validation (dem/val) period for NWS' proposal.

When the dem/val starts, we will have a standard baseline from which all CWSUs will be performing. We are working collaboratively with the FAA before the dem/val period to define and quantify additional metrics; this collaboration will continue during the dem/val. We will have independent verification and validation of all metrics, and we have engaged the National Academy of Sciences to conduct a final, objective assessment of the dem/val.

CWSUs are tasked with providing a regional and national weather picture, and collaborate with NWS's 122 Weather Forecast Offices (WFOs) to gain additional local expertise. [The proposal continues these fundamental concepts of operations.] FAA's requirement is for a common national picture of weather affecting the National Airspace System (NAS), and the proposed CWSU structure will be better suited to provide this support. Airport-specific weather forecasts, which address the local weather patterns, will continue to be provided by the local WFOs. CWSUs will continuously communicate and collaborate with local WFOs to ensure data consistency as we support Air Route Traffic Control Centers (ARTCCs), Terminal Radar Approach Control (TRACONs), and Control Towers.

Q2. The meteorologists who work in the 21 current Central Weather Service Units have developed detailed local knowledge of weather patterns. During the test phase of the consolidated program, I am wondering how you intend to staff the new consolidated center. If, for instance, you take the some of the most senior people out of the 21 existing centers, how can you fairly and accurately evaluate the current system versus the new proposal? What will become of the meteorologists at the existing CWSUs if consolidation occurs?

A2. While the CWSUs have developed local knowledge of weather patterns, much local expertise also resides with forecasters at the 122 WFOs, who provide specific airport forecasts via the Terminal Aerodrome Forecasts (TAF). In the new aviation services model, we will continue to combine the expertise of the WFO and CWSU, and the flying public will receive the benefit of a total collaboration to show a more consistent weather picture, enhanced by the new technology, 24x7 service, and improved weather products.

For the dem/val phase, we propose to use a mix of CWSU Meteorologists-in-Charge, WFO management staff (including Meteorologists-in-Charge, Warning Coordination Meteorologists, Science and Operations Officers), Regional Aviation Meteorologists (each of the six NWS Regions has one), and other regional management staff. Any person participating in the dem/val will have a solid background in aviation meteorology and the NWS aviation program. This dem/val staffing proposal would bring in experienced aviation meteorologists while leaving the current forecasting core undisturbed at all 21 CWSUs.

Should this consolidation occur, no NWS employee will be without a job opportunity. Anyone who wishes to continue their employment with NWS will have the opportunity to do so, either by bidding on one of the new positions at the CWSUs or by moving to another NWS position. The NWS anticipates that the majority of the FTE reductions will come from CWSU retirement-eligible employees electing to retire.

ANSWERS TO POST-HEARING QUESTIONS

Responses by Richard Day, Senior Vice President for Operations, Air Traffic Organization, Federal Aviation Administration

Questions submitted by Representative Daniel Lipinski

Q1. Mr. Powner's GAO report stated that "It is important to obtain an understanding of the current level of performance in these measures before beginning any efforts to restructure aviation weather services." If we cannot quantify how the current Central Weather Service Units (CWSUs) are working, I do not understand how we can rigorously compare them to the proposed consolidated centers. How can you design a reliable test when you cannot even characterize the control in your experiment? What steps are you taking to quantify current CWSU performance, and how well do those steps capture differences due to local weather patterns?

A1. In January 2009, the FAA provided the National Weather Service (NWS) with five performance standards for Center Weather Service Units. The performance standards are:

(1) participation in the development of the Collaborative Convective Forecast Product (CCFP), 100 percent of the time when convection is expected to occur within that specific ARTCC domain;

(2) consistency of Meteorological Impact Statements (MIS) and Center Weather Advisories (CWA) product formats, information content, and procedures for issuance, across all CWSUs;

(3) support for twice-daily stand-up briefings to ARTCC leadership 100 percent of the time;

(4) provision of on-site or backup services 16 hours per day, seven days per week, 100 percent of the time; and

(5) accuracy of forecasts used in decisions for traffic management initiatives.

Both the NWS and FAA are currently base-lining the performance standards we established and will be prepared to use these to compare services during the proposed demonstration/validation to ensure no degradation of services from those which are currently provided by CWSUs, locally and on-site. The standard and corresponding metric for the accuracy of forecasts used in decisions for traffic management initiatives will take a little more time to refine, but we believe that building on a developing tool called the Weather Impact Traffic Index, which translates both weather and weather forecast impact on air-traffic, will help us in our efforts.

Additionally, if we move forward with a demonstration/validation phase, we expect to develop a standard for response time for on-demand services provided remotely as we do not do measure this today.

Q2. The most recent NWS proposal is actually the latest in a long series of steps that began with two FAA goals: saving $2 million a year and ensuring uniform, high quality data from all Central Weather Service Units. While I am a strong advocate of saving taxpayers money, I worry that for a savings of only six cents per flight, we may be compromising public safety. As I understand it, the current proposal would only save about $1 million per year, savings that would be offset by transition costs of about $12 million. This means that it would take a decade to earn back the costs of transition. Are these figures correct? If so, can you explain the FAA's rationale for pursing these changes?

A2. The primary reason FAA is pursing changes in CWSU services is improved services, not a reduction in cost. These improvements include weather forecasting services available 24/7 as opposed to the current 16/7 coverage; higher-resolution, consistent forecasts, both temporally and spatially, for high demand terminal areas; standardized weather forecast operations; and performance based services.

The current NWS proposal indicates estimated savings of $2.6M per year. This equates to an approximate 20 percent savings compared to the current program. In addition, we expect transition costs to be offset by operational savings within five years.

Appendix 2:

ADDITIONAL MATERIAL FOR THE RECORD

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00065 Fmt 6601 Sfmt 6601 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

#1

December 19, 2007

INTERAGENCY AGREEMENT NO. DTFAWA-08-X-80000
BETWEEN

THE FEDERAL AVIATION ADMINISTRATION (FAA)

AND

THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE (NOAA/NWS)

For the Provision of Meteorological Support to the Air Route Traffic Control Centers

ARTICLE 1. PARTIES

The parties to this Agreement are the Federal Aviation Administration and the National Oceanic and Atmospheric Administration/National Weather Service (NOAA/NWS).

ARTICLE 2. SCOPE

a. Purpose

The purpose of this Agreement between the Federal Aviation Administration and the National Oceanic and Atmospheric Administration/National Weather Service is to provide weather information and forecasts to FAA facilities, principally the Air Route Traffic Control Centers and operational sites within their area of responsibility. Upon mutual acceptance of the terms and conditions of this Interagency Agreement, the FAA will reimburse the NWS for their services that provide weather information to FAA facilities.

b. Goals and Objectives

Adverse weather impacting aviation operations increases demands on FAA Air Traffic resources facilitating the safe and efficient use of airspace and airports. Center Weather Service Units (CWSUs) are NWS meteorological support units composed of NWS meteorologists that report to FAA Traffic Management Officers. These CWSUs directly support the 21 FAA Air Route Traffic Control Centers (ARTCCs) by providing meteorological consultation, nowcasting, and advice regarding weather events that may have potential impacts on air traffic operations. The meteorologists working at the CWSUs will be NWS employees, and the FAA will reimburse the NWS for their salaries and expenses, including expendable supplies and training on traffic management. Work will be performed in accordance with the CWSU Statement of Work dated October 1, 2007 and appended hereto as Attachment I.

c. Roles and responsibilities

The FAA agrees to:

1. Technical Direction: The FAA will provide technical direction of all services provided under this Interagency Agreement.
2. Procurement Actions: Any procurement actions to alter or change any equipment or services utilized under this Interagency Agreement will be coordinated between the

December 19, 2007

parties. However, only the FAA Contracting Officer will request or authorize solicitations, amendments, and contract modifications applicable to equipment or services.

3. Equipment, Training, Travel, and Supplies: The FAA will furnish to NWS all necessary supporting equipment required for the operation of the CWSUs. Necessary supporting equipment will be defined by agreement of the parties and will be listed in the Statement of Work appended as Attachment I, or in subsequent amendments to the Statement of Work. The FAA also will furnish training, travel, supplies, or specialized equipment which the parties agree is needed.

4. Security Clearances: There is no general FAA policy requiring NWS meteorologists to have security clearances, however, local ARTCCs may have specific requirements. If a local ARTCC does require that NWS meteorologists have security clearances, then the local ARTCC will be responsible for all costs associated with obtaining and maintaining such clearances.

5. Traffic Management Unit (TMU): Perform the duties of Weather Coordinator as outlined in the Statement of Work, in accordance with Statement of Work and the FAA Order 7210.38A, Center Weather Service Unit (CWSU).

6. Performance Measures: The FAA will establish performance standards and measures for assessment of CWSU capabilities.

The NWS agrees to:

1. Operate CWSUs at 21 FAA Air Route Traffic Control Centers (ARTCCs) using all meteorological data available so as to closely monitor both current and forecast conditions that are likely to affect airspace within the ARTCC boundary.

2. Keep air traffic operational personnel advised of aviation weather conditions, with special emphasis on those conditions that would be hazardous to aviation or impede the flow of air traffic in the National Airspace System (NAS).

3. Perform duties at the CWSU on their assigned shifts in accordance with the Statement of Work and NWS Instruction 10-803, Support to Air Traffic Control Facilities.

4. Develop and track metrics to support FAA's requirement for performance measures and provide routine feedback to FAA.

ARTICLE 3. EFFECTIVE DATE AND TERM

This Agreement is effective January 1, 2008, and shall continue in effect until September 30, 2009, unless terminated by the parties, as provided herein. The FAA may extend the term of this agreement by written notice to NWS within 10 days; provided that the FAA shall give the NWS a preliminary written notice of its intent to extend at least 60 days before the agreement expires. The total duration of this Agreement, including the exercise of a one-year option shall not exceed 33 (months).

This agreement is subject to the availability of funds and supersedes Interagency Agreement No. DTFAWA-06-X-80003.

December 19, 2007

ARTICLE 4. DELIVERY/PERFORMANCE

a. Each CWSU will be staffed by NWS meteorologists experienced in aviation weather, operating 2 shifts per day. Normal Operating Hours are approximately 0500 Local Time to approximately 2100 Local Time. Actual operating hours and shift assignments will be determined by the ARTCC Traffic Management Officer (TMO) in conjunction with the NWS Meteorologist in Charge (MIC). Anticipated staffing level is 4 meteorologists at each CWSU, including the MIC.

b. Pursuant to Article 9.b., The FAA will reimburse the NWS quarterly for personnel costs including overtime, and NOAA support and overhead charges for work performed under this Interagency Agreement. Not later than March 31 of each year the NWS will furnish the FAA a detailed cost estimate of the funding required for the operation of the CWSUs to include:

   1. An update of the estimate of costs for balance of the current Fiscal Year, based on known obligations, and
   2. An outlook of estimated costs for each year of the next three-year period. The estimate shall include the grade, step, and annual salary of all meteorologists and the anticipated NOAA support and overhead charges for the Fiscal Year. The FAA will evaluate this request and annotate the estimate with the approved amount.

c. Whenever there is reason to believe that the actual cost for a fiscal year will exceed the approved estimate, the NWS will submit a revised estimate. Subject to the agreement of the Contracting Officer, the FAA will respond with a Modification to the Agreement.

d. The Traffic Management Officer will be the approving official for costs associated with Permanent Change of Station (PCS), travel and supply and will pay for these costs. As a result PCS, travel and supply costs are not associated with this Interagency Agreement.

ARTICLE 5. REPORTING REQUIREMENTS

The FAA Traffic Management Officer at each ARTCC will conduct an annual evaluation of the services provided by the CWSU. The evaluation shall be sent to the appropriate FAA Director of Tactical Operations (DTO), and to the Director of System Operations Services, AJR-1. Copies shall be provided to the NWS; specifically, to the MIC of the CWSUs under evaluation, and to the NWS Aviation Weather Services Branch Chief.

Within 30 days of the end of each quarter, the NWS will provide the FAA with the actual costs incurred during the previous quarter, using the same line item categories that were defined in the annual budgetary estimate.

ARTICLE 6. RELEASE OF TECHNICAL DATA

No information, oral or written, concerning the results or conclusions made pursuant to this Agreement shall be published or released to the public without the prior written approval of the FAA Contracting Officer.

December 19, 2007

ARTICLE 7. LEGAL AUTHORITY

This Agreement is entered into by the FAA under the authority of the Federal Aviation Act of 1958, 49 U.S.C. § 106(l) and § 106(m), and by NOAA/NWS also under the authority of Title 49 of the U.S.C. § 44720, and Title 15 of the U.S.C. § 313.

ARTICLE 8. POINTS OF CONTACT

FAA Program Manager
Michael J. Sammartino, Director
System Operations Services (AJR-1)
Air Traffic Control System Command Center (ATCSCC)
13600 EDS Drive, Suite 100
Herndon, VA 20171

Contract Officer's Technical Representative (COTR)
Mark Marchese
System Operations Services
Air Traffic Control System Command Center (ATCSCC)
13600 EDS Drive, Suite 100
Herndon, VA 20171
Phone Number: 703-326-3713
Mark.marchese@faa.gov

FAA Contracting Officer
Katherine M. Williams, AJA-48
800 Independence Avenue, SW
Washington, DC 20591
(202) 267-3669
Fax (202) 267-5142
Katherine.M.Williams@faa.gov

National Weather Service Technical Officer
Kevin L. Johnston, Chief
Aviation Weather Services
National Weather Service
1325 East-West Hwy.
Silver Spring, MD 20910
301-713-1726, x109
Kevin.L.Johnston@noaa.gov

National Weather Service Authorizing Official
John L. Hayes
Assistant Administrator for Weather Services/NOAA
1325 East-West Highway
Silver Spring, Maryland 20910
(301) 713- 0689

December 19, 2007

National Weather Service Chief Financial Officer/Chief Administrative Officer
Robert J. Byrd
1325 East-West Highway
Silver Spring, MD 20910
301-713-9064

ARTICLE 9. FUNDING AND PAYMENT

Funding may be provided subject to availability. The total estimated cost for this Agreement is $20,067,680.00. Estimated cost for the period January 1, 2008 to September 30, 2008 is $8,397,236.00. Estimated cost for the period October 1, 2008 to September 30, 2009 is $11,670,444.00. This agreement is subject to the availability of funds each fiscal year. The FAA may issue a Modification to authorize subsequent reimbursement under this agreement subject to funds availability. The obligation amount will be determined at that time.

In addition to the amounts identified above, a one-time obligation, not to exceed $284,508.00, is authorized for the technical refresh of the AWIPS (Advanced Weather Interactive Processing System) Remote Display (ARD), bringing the total estimate for this agreement to $20,352,188.00. Details of the technical refresh, including payment terms, will be negotiated and agreed upon by the NWS and FAA. Funding, not to exceed $41,000.00, is included in the FY 2009 amount stated above for the on-going maintenance of communication lines associated with the technical refresh.

a. Additional funding may be provided by the FAA based on updated NWS Cost Estimates, and this Agreement may be modified accordingly.

b. A properly executed request for payment (Standard Form TFS-7306) should be submitted quarterly to the FAA at the billing address identified below, with copies to the FAA Program Officer and the FAA Contracting Officer at the address shown in ARTICLE 8. Billing Address: FAA – Accounts Payable Branch, AFM-220, 800 Independence Avenue, SW, Washington, DC 20591.

c. Upon termination or expiration of this Agreement, any FAA funds which have not been spent or obligated for allowable expenses prior to the date of termination and are not reasonably necessary to cover termination expenses shall be returned to the FAA.

d. The FAA 's obligation under this agreement is contingent upon the availability of appropriated funds from which payment for agreement purposes can be made. No legal liability on the part of the FAA for any payment may arise until funds are made available to the Contracting Officer for this agreement and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

OMB required codes:

	NWS	FAA
Treasury Account Symbol:	13x1450	69-8-1301
DUNS Number:	78-4769085	73-05-88975
Business Event Type Code:	COLL	DISB

December 19, 2007

ARTICLE 10. LIMITATION OF FUNDS

(AMS) Clause 3.3.1-10 *Availability of Funds (April 1996)*
Funds are not presently available for this agreement. The FAA's obligation under this agreement is contingent upon the availability of appropriated funds from which payment for agreement purposes can be made. No legal liability on the part of the FAA for any payment may arise until funds are made available to the Contracting Officer for this agreement and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

The FAA's liability to make payments to the NWS is limited to the amount of funds obligated hereunder, including written modifications to this Agreement. The NWS is obligated to perform work under this agreement only to the extent that funding is authorized by the FAA.

ARTICLE 11. APPROVAL OF PRIME CONTRACTS/MODIFICATIONS

Not applicable

ARTICLE 12. CHANGES, MODIFICATIONS

a. Changes and/or modifications to this Agreement shall be in writing and signed by an FAA Contracting Officer and the NWS Approval Official, or their duly authorized representatives acting within the scope of their authority. No oral statement by any person shall be interpreted as modifying or otherwise affecting the terms of this Agreement. All requests for interpretation or modification shall be made in writing.

b. The FAA and NWS Technical Officers identified in ARTICLE 8 are responsible for the technical administration of this Agreement. The FAA Technical Officer is not authorized to make any changes that impact the cost, schedule or performance of this Agreement without the written consent of the FAA Contracting Officer.

ARTICLE 13. TERMINATION

This agreement may be terminated with or without cause, by either party at any time prior to its expiration date. The terminating party will provide written notice of termination to the other party, at least ninety days prior to the date of termination. The termination notice shall be signed by a warranted FAA Contracting Officer, when the FAA is the withdrawing party. When the NWS is the withdrawing party, the FAA contracting Officer shall be notified of the termination in writing by the NWS. The act of termination shall not affect the billing and transfer of funds for actual costs incurred before the effective date of termination for those sites in which the termination occurs. If FAA cancels the order, NWS is authorized to collect costs incurred prior to cancellation of the order plus any termination costs, up to the total payment amount provided for under this agreement. Upon termination of this agreement, both parties agree to meet together to minimize termination costs. Furthermore, upon receipt of a notice of termination, NWS shall take immediate steps to stop the accrual of any additional obligations that might require payment.

December 19, 2007

ARTICLE 14. ORDER OF PRECEDENCE

In the event of any inconsistency between the terms of the Agreement, the inconsistency **shall be** resolved by giving preference in the following order:

a. The Agreement
b. The Attachment – The FAA Statement of Work
c. The FAA Order 7210.38A
d. The NWS Instruction 10-803

ARTICLE 15. PROTECTION OF INFORMATION

The parties agree that they shall take appropriate measures to protect proprietary, privileged, or otherwise confidential information that may come into their possession as a result of this Agreement.

ARTICLE 16. DISPUTES

Disputes shall be resolved pursuant to applicable provisions of the Business Rules for Intragovernmental Transactions delineated in the Treasury Financial Manual, Vol.1, Bulletin 2007-03, Section VII (Resolving Intragovernmental Disputes and Major Differences).

AGREED:

National Weather Service, NOAA	Federal Aviation Administration
BY: John L. Hayes Assistant Administrator NOAA/National Weather Service	BY: Sarah Scott Contracting Officer, Federal Aviation Administration
	Sarah Scott 12/21/07
Signature & Date	Signature & Date

December 19, 2007

ARTICLE 14. ORDER OF PRECEDENCE

In the event of any inconsistency between the terms of the Agreement, the inconsistency shall be resolved by giving preference in the following order:

a. The Agreement
b. The Attachment – The FAA Statement of Work
c. The FAA Order 7210.38A
d. The NWS Instruction 10-803

ARTICLE 15. PROTECTION OF INFORMATION

The parties agree that they shall take appropriate measures to protect proprietary, privileged, or otherwise confidential information that may come into their possession as a result of this Agreement.

ARTICLE 16. DISPUTES

Disputes shall be resolved pursuant to applicable provisions of the Business Rules for Intragovernmental Transactions delineated in the Treasury Financial Manual, Vol.1, Bulletin 2007-03, Section VII (Resolving Intragovernmental Disputes and Major Differences).

AGREED:

National Weather Service, NOAA	Federal Aviation Administration
BY: John L. Hayes Assistant Administrator NOAA/National Weather Service	BY: Sarah Scott Contracting Officer, Federal Aviation Administration
12/21/2007 Signature & Date	Signature & Date

V1.0 (01 October 2007)

Statement of Work (SOW)

in support of

Interagency Agreement No. DTFAWA-08-X-80000

References: (1) FAA Order 7210.38A, 6 April 84; Revised 30 May 1990: Center Weather Service Units (CWSUs). Federal Aviation Administration, 8 pp. and Attachment (NWS Instruction 10-803).

(2) NWS Instruction 10-803, 5 January 2005: NWSPD 10-8, Support to Air Traffic Control Facilities, National Weather Service, 25 pp.

The Statement of Work for the Interagency Agreement covering a 21 month period, beginning in January 2008 is derived from the current FAA Order and NWS Instruction relevant to the operation of the Center Service Weather Units (CWSUs), as referenced above.

1. Background

The purpose of the CWSUs is to provide professional meteorological services to the Air Route Traffic Control Centers (ARTCCs). CWSU staff meteorologists are to detect hazardous weather conditions air traffic and disseminate this information to the appropriate positions and facilities within the ARTCCs area of responsibility. The technical expertise of the CWSU meteorologist is complemented by the aviation expertise and area knowledge of the CWSU Weather Coordinator (WC). This position is usually assigned to personnel in the Traffic Management Unit (TMU).

2. Mission and Responsibilities

The primary function and responsibility of the CWSU is to provide meteorological advice and consultation to center operations personnel and other designated FAA air traffic facilities, terminal and en route, within the ARTCC area of responsibility.

3. Product and Services

Information provided by the CWSU is developed through analysis and interpretation of available weather data. This information is presented in the form of briefings and other weather products including:

3.1 Briefings - generally consists of a forecast of weather conditions pertinent to the ARTCC area during a specified period, plus an extended outlook. Briefings will be scheduled and provided as required b the Traffic Management Officer (TMO).

3.2 Meteorological Impact Statement (MIS) - an unscheduled planning forecast describing conditions expected to begin within 12 hours which will, in the forecaster's judgment, impact the flow of traffic within the ARTCC area.

3.3 Center Weather Advisory (CWA) - an unscheduled air traffic and aircrew advisory statement that is generally a nowcast for conditions currently in existence or beginning within the next 2 hours. A CWA may be issued to supplement or redefine an existing SIGMET, or when, as detailed in National Weather Service Instruction (NWSI) 10-803, conditions warrant.

3.4 Collaborative Convective Weather Forecast (CCFP) - a forecast of convection in the extended range (2-6 hours) for the contiguous United States (CONUS) that is produced by the NWS Aviation Weather Center after collaboration with CWSUs and national Air Space (NAS) stakeholders.

3.5 The duties and responsibilities described herein are not all inclusive. The TMO shall ensure that comprehensive local orders and procedures for operation of the CWSU are developed to supplement this order. Local orders shall include a prioritized listing of the duties and responsibilities of both the meteorologist and WC. The NWSI 10-803 contains a listing of priorities for the meteorologist.

4. Responsibilities of the Meteorologist-in-Charge (MIC)

4.1 The CWSU MIC is the operational supervisor of the assigned meteorologists and is responsible for ensuring the CWSU meets the center's weather support requirements as established by this Statement of Work and the TMO.

4.2 The CWSU MIC shall establish time and attendance procedures for the CWSU meteorologists.

4.3 The CWSU MIC is responsible for being the liaison to the NWS Weather Forecast Office (WFO) and the Regional Aviation Meteorologist (RAM).

4.4 The CWSU MIC is responsible for quality control, verification, and training on products and services delivered by the CWSU.

5. Responsibilities of Meteorologists

5.1 Provides meteorological support for air traffic facilities, with the primary function of analyzing and interpreting available weather data to determine

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00075 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

actual and near-term forecast weather conditions, and to provide a "nowcasting" service. Nowcasting is a description of existing conditions or a diagnosis of a given situation that can be used to make operational decisions. Examples are: a sooner-than-expected development of thunderstorms, or the beginning of snow when one was anticipated. It allows the meteorologist to advise ATC personnel of changing weather conditions and provide an updated forecast.

5.2 Monitor and seek sufficient weather information to provide timely advice on weather conditions which affect, or have the potential to affect, air traffic services or aircraft operations within the assigned ARTCC area, to include, but not limited to:

(1) Thunderstorm location and intensity
(2) Areas of precipitation
(3) Cloud coverage
(4) Icing levels
(5) Turbulence
(6) Winds aloft
(7) Low level wind shear
(8) Areas of less than 3 miles visibility and/or ceiling less than 3,000 feet
(9) Significant pressure change (as defined in NWSI 10-803)
(10) Volcanic ash

5.3 Prepares and disseminates Meteorological Impact Statements (MISs) and Center Weather Advisories (CWAs) as established by local order, either directly or through the WC, using available communications circuits.

5.4 Conducts weather familiarization training for air traffic personnel as required by the TMO.

5.5 Conducts preshift weather briefings as required by the TMO.

6. Weather Coordinator (WC)

6.1 This position functions as the interface between the NWS meteorologist and the facility air traffic staff. The WC is primarily responsible for the inter/intra-facility dissemination of SIGMETs, CWAs, and urgent PIREPs, and provides assistance in the collection and dissemination of other significant weather information.

6.2 The WC position is required to be occupied on all shifts. All personnel assigned to this function must have received prior training in the associated duties and responsibilities of this position. If weather conditions and workload permit, the WC may perform other operational or administrative

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00076 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

functions. However, the primary duty of the WC remains that of weather coordinator.

6.3 Priority of Duties and Responsibilities

(1) Inter/intrafacility dissemination of SIGMETs.
(2) Disseminate CWAs within the ARTCC.
(3) Disseminate urgent PIREPs within the ARTCC.
(4) Disseminate CWAs to other facilities.
(5) Inter- and intra-facility dissemination of Meteorological Impact Statement as required.
(6) Disseminate other weather intelligence within the ARTCC as specified by local requirements.
(7) Receipt and handling of requests for PIREP/SIGMET and other pertinent weather information.

6.4 In the absence of a meteorologist, assistance may be obtained through an adjacent CWSU, or through the FAA Weather Unit at the Air Traffic Control System Command Center (ATCSCC).

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00077 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

#2

ORDER

7210.38A

CENTER WEATHER SERVICE UNIT (CWSU)

APRIL 6, 1984

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Distribution: A-WX(AT)-3; A-Y(AY)-3; A-FAT-1(MAX); A-FAT-2,3,4,5,6,7,8 (LTD)

Initiated By: AAT-330

RECORD OF CHANGES

DIRECTIVE NO. 7210.38A

CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE
1				5/30/90					

FAA Form 1320-5 (5-68) SUPERSEDES PREVIOUS EDITION

FOREWORD

* The concept of the Center Weather Service Unit (CWSU) was initially established in 1978, and is currently in operation at 21 air route traffic control centers.

In an agreement with the National Oceanic and Atmospheric Administration, National Weather Service (NWS) meteorologists are assigned to the ARTCC CWSU's to provide real-time information on hazardous weather conditions for direct input into the air traffic control system.

This order prescribes the national standard operating procedures for both FAA personnel and NWS meteorologists assigned to a CWSU. The ultimate effectiveness of the CWSU, however, will be dependent on:

Reliable and timely weather products and services.

Close and mutual interaction, understanding, and cooperation between meteorologists and controllers.

An in-depth knowledge and understanding of the air traffic control system and its precise weather needs.

Timely and accurate dissemination of hazardous weather information.

John D. Canoles
Acting Director, Air Traffic
Rules and Procedures Service

TABLE OF CONTENTS

CHAPTER 1. GENERAL

1. PURPOSE. This order restates the requirement for the establishment of the Center Weather Service Unit (CWSU), and the national standard operating procedures for Federal Aviation Administration personnel and National Weather Service (NWS) meteorologists assigned to a CWSU.

2. DISTRIBUTION. This order is distributed to appropriate NWS offices, air traffic branches in Washington and Regional Headquarters, FAA Academy branches, and all air traffic field offices and facilities.

3. CANCELLATION. Order 7210.38, Center Weather Service Unit (CWSU), dated February 23, 1979, is canceled.

4. BACKGROUND. The Air Traffic Service established the CWSU as the focal point for professional meteorological services within the Air Route Traffic Control Centers (ARTCC's). NWS meteorologists are assigned to detect hazardous weather conditions and disseminate information on the hazard to the appropriate positions and facilities within the center's area of responsibility. The technical expertise of the CWSU meteorologist is complemented by the aviation and area knowledge of the CWSU Weather Coordinator (WC).

5-9 RESERVED

CHAPTER 2. DUTIES AND RESPONSIBILITIES

10. CENTER WEATHER SERVICE UNIT (CWSU).

a. The primary function and responsibility of the CWSU is to provide meteorological advice and consultation to center operations personnel and other designated FAA air traffic facilities, terminal and FSS, within the ARTCC area of responsibility.

b. Information provided by the CWSU is developed through analysis and interpretation of available weather data and is provided in the form of briefings and other weather products (forecasts and nowcasts).

(1) Briefings - Generally consist of a forecast of weather conditions pertinent to the ARTCC area during a specified period, plus an extended outlook. Briefings will be scheduled and provided as required by the facility manager.

(2) Meteorological Impact Statement (MIS) - An unscheduled planning forecast describing conditions expected to begin within 4 to 12 hours which will, in the forecaster's judgement, impact the flow of traffic within the ARTCC area.

(3) Center Weather Advisory (CWA) - An unscheduled air traffic and aircrew advisory statement which is generally a nowcast for conditions currently in existence or beginning within the next 2 hours. A CWA may be issued to supplement or redefine an existing SIGMET, or, when as detailed in WSOM Chapter D-25, conditions warrant.

c. The duties and responsibilities described herein are not all inclusive. Facility managers shall ensure that comprehensive local orders and procedures for operation of the CWSU are developed to supplement this order. Local orders shall include a prioritized listing of the duties and responsibilities of both the meteorologist and WC. Exhibit D-25-3, Attachment 1, WSOM Chapter D-25, Center Weather Service Unit Priority of Duties, is the listing of meteorologist priorities. Changes will require approval by both NWS and FAA regional headquarters. Copies of
* local orders on CWSU procedures shall be forwarded to ATP-130. *

d. Operational problems that cannot be resolved between the MIC and the facility manager will be forwarded to FAA and NWS regional headquarters.

11. FACILITY MANAGER.

a. The ARTCC facility manager has operational responsibility for the CWSU, and shall:

* (1) Make provisions to ensure a WC is assigned on each shift.*

(2) Establish procedures to ensure that operational personnel:

(a) Receive pertinent and timely weather data.

(b) Broadcast SIGMET/CWA messages as required.

(c) Solicit and relay PIREP's as requested.

(3) Provide facility and air traffic control system familiarization training for assigned meteorologists.

12. METEOROLOGIST-IN-CHARGE (MIC).

a. The MIC is the operational supervisor of the assigned meteorologists, and is responsible for ensuring that the CWSU meets the center's weather support requirements as established by this order and the facility manager.

b. The MIC shall establish time and attendance procedures for the CWSU meteorologists.

13. METEOROLOGIST.

a. Provides meteorological support for air traffic facilities, with the primary function of analyzing and interpreting available weather data to determine actual and near-term forecast weather conditions and to provide a "nowcasting" service. Nowcasting is a description of existing conditions or a diagnosis of a given situation which can be used to make operational decisions. Examples are a sooner-than-expected development of thunderstorms or the beginning of snow when none was anticipated. It allows the meteorologist to advise ATC personnel of changing weather conditions and provide an updated forecast.

b. Monitor and seek, where necessary, sufficient weather
* intelligence to provide timely advice on weather conditions which *
affect, or have the potential to affect, air traffic services or aircraft operations within the assigned ARTCC area, to include, but not limited to:

(1) Thunderstorm location and intensity;

(2) Areas of precipitation;

(3) Cloud coverage;

(4) Icing levels;

(5) Turbulence;

(6) Winds aloft;

(7) Low level wind shear;

(8) Areas of less than 3 miles visibility and/or ceilings less than 3,000 feet, and

(9) Significant pressure changes (as defined in WSOM Chapter D-25).

c. Prepares and disseminates meteorological impact statements and center weather advisories as established by local order, either directly or through the WC, using the Leased Service A, 9020/FDEP, or long line telephone system, as appropriate.

d. Conducts weather familiarization training for air traffic personnel as required by the facility manager.

e. Conducts preshift weather briefings as required by the facility manager.

14. WEATHER COORDINATOR (WC).

a. This position functions as the interface between the NWS meteorologist and the facility air traffic staff, as required. The WC is primarily responsible for the inter/intrafacility dissemination of SIGMET's, CWA's, and urgent PIREP's, and provides assistance in the collection and dissemination of other significant weather information.

b. Manning of the WC positon is required on all shifts, and all personnel assigned to this function must have received prior training in the associated duties and responsibilities. If weather conditions and workload permit, the WC may perform other operational or administrative functions, however, the primary duty remains that of weather coordinator.

c. Priority of Duties and Responsibilities.

(1) Inter/intrafacility dissemination of SIGMET's.

(2) Disseminate CWA's within the ARTCC.

(3) Disseminate urgent PIREP's within the ARTCC.

(4) Disseminate CWA's to other facilities (via other than LSAS).

(5) Inter/intrafacility disseminatin of Meteorological Impact Statements as required (via other than LSAS).

(6) Disseminate other weather intelligence within the ARTCC as specified by local requirements.

(7) Receipt and handling of requests for PIREP/SIGMET and other pertinent weather information.

d. In the absence of a meteorologist, assistance may be obtained through an adjacent CWSU, or the Central Flow Weather Service Unit meteorologist.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00085 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

15. CENTRAL FLOW WEATHER SERVICE UNIT (CFWSU).

a. Provides meteorological advice and consultation to Traffic Flow Management Branch (AAT-440) personnel on weather conditions which may adversely affect the National Airspace System (NAS).

b. CFWSU meteorologist responsibilities are outlined in WSOM Chapter D-25.

16-19 RESERVED

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00086 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

CHAPTER 3. ADMINISTRATION

20. OPERATING HOURS AND STAFFING. Total shift staffing and the operational hours of each CWSU shall be specified by the MIC in consonance with the ARTCC facility manager. Shift staffing shall * be based upon available human resources, air traffic volume, and weather considerations. Shift hours shall be varied as necessary to ensure adequate meteorologist support when hazardous weather conditions are known to be occurring or are forecast to occur. ARTCC facility managers shall ensure that the WC position is manned on all shifts.

21. LEAVE AND OVERTIME. Annual leave and overtime, which affects the normal operating hours of the CWSU, shall be subject to the approval of the ARTCC facility manager. Sick leave will be handled in accordance with standard procedures. *

22. DOCUMENTATION AND REPORTING OF LSAS EQUIPMENT/CIRCUIT OUTAGES AND MALFUNCTIONS.

a. Documentation of LSAS equipment/circuit outages. Each CWSU shall record equipment/circuit outages on FAA Form 7230-4 (Daily Record of Facility Operation).

b. Program Reporting Procedures. Malfunctions or failures at the facility shall be analyzed to determine if the problem is * either with WMSC or CONTEL.

c. If it is determined the failure is CONTEL's responsibility, the CWSU shall report the problem to the designated CONTEL customer care center (CCC). CONTEL shall be requested to restore equipment/circuit failure as soon as possible.

(1) In addition to reporting trouble to CONTEL, system outages shall also be reported to the ARTCC system engineer for inclusion in the National Airspace Performance Reporting System.

(2) The following conditions shall be reported to the Regional Assistant LSAS Program Manager and Systems Management Center through the circuit coordinator when:

(a) Unable to contact the CCC within 15 minutes to report an outage.

(b) An unsatisfactory response to a trouble report has been received from CONTEL.

(c) CONTEL technician does not arrive within a reasonable commuting time or 3 hours, whichever occurs first. *

(d) Unsatisfactory maintenance has been received on terminal equipment.

23-29 RESERVED

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00087 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

February 10, 1984

W/OM13x1

TO: All Holders of Operations Manual

SUBJECT: Transmittal Memorandum for Operations Manual Issuance 84-1

1. Material Transmitted:

WSOM Chapter D-25, Support to Air Traffic Facilities.

2. Summary:

The entire chapter has been revised. Major changes are as follows.

a. The chapter was restructured to more clearly state the air traffic facilities support to be provided by all designated elements of the National Weather Service. The sample Center Weather Service Unit (CWSU) Station Duty Manual has been deleted.

b. Definitions and terminology for all relevant FAA facilities and personnel have been updated.

c. The Central Flow Weather Service Unit (CFWSU) is described and its responsibilities defined.

d. The responsibilities, relationships, and priorities of the members of the CWSU, especially those of the recently added meteorologists in charge and the weather coordinator, have been defined, redefined, or clarified.

e. The products prepared by the CWSU to provide advice and consultation to the National Airspace System have been updated, redefined, and/or clarified.

f. The responsibility, methodology, and priority for the dissemination of these products have been defined.

g. The need for National Weather Service product coordination between facilities providing air traffic facility support has been defined.

h. The role, responsibility, and accountability of the National Weather Service area manager in CWSU and air traffic facility support have been clarified and emphasized.

i. The responsibility for providing pressure trend information to air traffic facilities has been transferred to the National Aviation Weather Advisory Unit which will communicate through the CFWSU.

3. Effect on Other Instructions:

This chapter is effective as of 1000 Greenwich Mean Time on March 15, 1984. It supersedes WSOM Chapter D-25, Issuance 78-13, dated August 8, 1978; Issuance 79-1, dated February 14, 1979; Operations Manual Letter 8-83, dated April 4, 1983; and any regional or local agreements with air traffic facilities which are at variance with the policies and instructions contained herein.

for Richard E. Hallgren
Assistant Administrator
for Weather Services

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00089 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Issue Date	Org. Code
2-10-84	W/OM13x1

NATIONAL WEATHER SERVICE
Operations Manual

Part	Chap.
D	25

SUPPORT TO AIR TRAFFIC FACILITIES

Table of Contents — Page

SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

Table of Contents

SECTION 1 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

1. Purpose. This chapter provides the National Weather Service's (NWS) policies on weather support of Federal Aviation Administration (FAA) Air Traffic Facilities. This support is designed to improve safety and enhance the efficient flow of air traffic. It is provided through specialized forecasts, nowcasts, and briefings.

1.1 Description of Air Traffic Facilities Supported.

a. "Central Flow Control Facility (CFCF). CFCF is a part of the Air Traffic Control Command Center (ATCCC) located at the Federal Aviation Administration Headquarters. The ATCCC is an air traffic service facility consisting of CFCF and three other operational units: Central Altitude Reservation Function (CARF); Airport Reservation Office (ARO); and ATC Contingency Command Post. The CFCF is responsible for the coordination and approval of all major inter-center flow control restrictions made on a system basis in order to obtain maximum utilization of the airspace.

b. "Air Route Traffic Control Center (ARTCC). A radar facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

c. "Approach Control Facility. An Air Traffic Control (ATC) facility providing approach control service to one or more terminal areas.

d. "Airport Traffic Control Tower. A terminal facility providing ATC services to aircraft operating on the movement area and in the vicinity of an airport.

e. "Flight Service Station (FSS). An air traffic facility providing pilot weather briefing, en route communications, and VFR search and rescue services; assistance to lost aircraft and aircraft in emergency situations; relay of ATC clearances; preflight and in-flight advisory services, and other services to pilots, via air/ground communications facilities including the Enroute Flight Advisory Service (EFAS), a service specifically designed to provide timely weather information directly to the en route pilot."

2. General. The FAA requires the best possible weather information affecting the safe and efficient utilization of airspace and airports to assist in air traffic management. This includes information on the following:

a. Convective weather.
b. Low ceilings and visibility.
c. Cloud tops.
d. Wind, both surface and aloft.
e. Wind shear.

f. Significant pressure changes.
g. Precipitation.
h. Turbulence.
i. Icing.

3. Central Flow Weather Service Unit (CFWSU). The CFWSU consists of NWS meteorologists assigned to CFCF for the purpose of providing consultation and advice for use by the staff of the ATCCC concerning weather conditions that may adversely affect the National Airspace System (NAS) during the next 24-hour period. This support is provided through detailed briefings of current and forecast weather several times a day.

3.1 CFWSU Meteorologist Responsibilities. The CFWSU meteorologists:

a. participate in Severe Weather Avoidance Nationwide (SWAN) plan activities as a primary source of weather information to the affected ATCCC unit;

b. coordinate with one or more Center Weather Service Units (CWSU's) concerning weather affecting the ARTCC areas; and

c. are consultants to ARTCC weather coordinators in the contiguous U.S. in the absence of a CWSU meteorologist. This backup service is intended only during unavoidable breaks in scheduled coverage, i.e., sick leave or unit vacancies which leave the CWSU meteorologist in charge (MIC) unable to cover a regularly scheduled shift. (NOTE: When support is required, the MIC of a CWSU should arrange CFWSU backup sufficiently far in advance to allow the impact of the request to be evaluated. CFWSU is authorized, when necessary, to request that an adjacent CWSU assist in meeting this backup responsibility.)

4. Center Weather Service Unit (CWSU). The CWSU is a joint agency aviation weather support team composed of NWS meteorologists and an FAA controller or traffic management coordinator assigned to the weather coordinator position. The purpose of the CWSU is to provide weather consultation and advice to managers and staff within the ARTCC and to other supported FAA facilities. This is done through briefings and products (forecasts and nowcasts) describing actual or forecast adverse weather conditions which may affect air traffic flow or operational safety over the ARTCC's portion of the NAS or other locally defined special operations (e.g., offshore helicopter operations). The CWSU also provides weather information dissemination services making products available to outside users including pilots, dispatchers, and service companies. Exhibits D-25-1 and D-25-2 describe the area of responsibility and relationships, respectively, for each CWSU. Locally designated products for conditions outside of these areas may be prepared if, in the MIC's judgment, sufficient information and resources are available. CWSU meteorologist staffs operate two shifts per day with the actual duty hours determined by the MIC, in consonance with the ARTCC's manager, i.e., the air traffic manager (ATM).

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00093 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

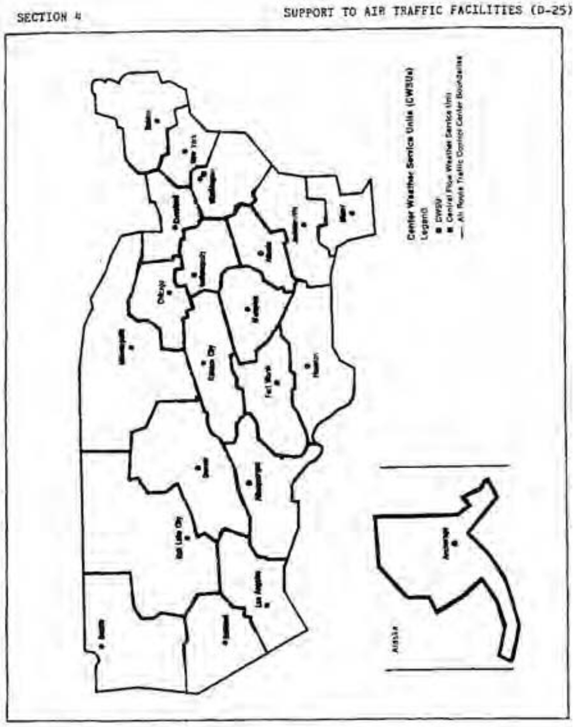


Exhibit D-25-1: Air Route Traffic Control Center/CWSU Areas

ARTCC/ID LOCATION	NWS SUPPORT FACILITY	WSFO's IN CWSU AREA OF RESPONSIBILITY	SSU SUPPORTING CWSU
ALBUQUERQUE/ZAB ALBUQUERQUE, NM	WSFO ABQ	ABQ, LBB, OKC, PHX. DEN	MKC
ANCHORAGE/ZAN ANCHORAGE, AK	WSFO ANC	ANC, FAI, JNU	ANC
ATLANTA/ZTL HAMPTON, GA	WSFO ATL	ATL, BHM, MEM, RDU, CRW, DCA	WBC
BOSTON/ZBW NASHUA, NH	WSFO BOS	BOS, ALB, PWM,	WBC
CHICAGO/ZAU AURORA, IL	WSFO CHI	CHI, IND, ARB, MKE, DSM	MKC
CLEVELAND/ZOB OBERLIN, OH	WSFO CLE	CLE, PIT, BUF, CRW, DTW	WBC
DENVER/ZDU LONGMONT, CO	WSFO DEN	ABQ, CYS, DEN, FSD, OMA PHX, SLC, TOP, GTF	MKC
FORT WORTH/ZFW EULESS, TX	WSFO DFW	DFW, OKC, MSY, LIT, ABQ, LBB	MSY
HOUSTON/ZHU HOUSTON, TX	WSFO SAT	DFW, MSY, SAT, JAN, LBB, BHM	MSY
INDIANAPOLIS/ZID INDIANAPOLIS, IN	WSFO IND	IND, SDF, CLE, CRW, MEM, CHI	MKC
JACKSONVILLE/ZJX HILLIARD, FL	WSFO MIA	CAE, ATL, MIA, BHM	MIA
KANSAS CITY/ZKC OLATHE, KS	WSFO TOP	TOP, STL, CHI, OMA, DEN, OKC, DSM, LBC	MKC
LOS ANGELES/ZLA PALMDALE, CA	WSFO LAX	LAX, PHX, RNO, SFO, SLC	SFO
MEMPHIS/ZME MEMPHIS, TN	WSFO MEM	MEM, LIT, JAN, BHM, MSY, CHI, SDF, STL	MSY
MIAMI/ZMA MIAMI, FL	WSFO MIA	MIA	MIA
MINNEAPOLIS/ZMP FARMINGTON, MN	WSFO MSP	ARB, BIS, DSM, FSD, MKE MSP,OMA. STL, TOP	MKC
NEW YORK/ZNY RONKONKOMA,NY	WSFO NYC	NYC, PHL, ALB, BOS	WBC
OAKLAND/ZOA FREMONT, CA	WSFO SFO	LAX, RNO, SFO	SFO
SALT LAKE CITY/ZLC SALT LAKE CITY, UT	WSFO SLC	BIS, BOI, CYS, DEN, FSD GTF, PDX, RNO, SLC	SFO
SEATTLE/ZSE AUBURN, WA	WSFO SEA	BOI, GTF, PDX, RNO, SEA, SFO	SFO
WASHINGTON/ZDC LEESBURG, VA	WSFO WBC	DCA, PHL, CRW, RDU	WBC

Exhibit D-25-2: Relationships of Center Weather Service Units

SECTION 4 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

4.1 Responsibilities.

4.1.1 The ARTCC Manager. The ATM of each ARTCC has operational responsibility for the CWSU. ATM's oversee implementation of FAA and NWS CWSU operating policies and bring any special local requirements to the attention of the CWSU MIC.

4.1.2 The CWSU Meteorologist in Charge. The CWSU MIC is the first line supervisor of the assigned meteorologists. The MIC determines the procedures to be followed in implementing this chapter, FAA order 7210.38A and compatible or approved procedures to meet special local requirements. Such procedures will be detailed in the CWSU Station Duty Manual (SDM).

4.1.3 The CWSU Meteorologist. The CWSU meteorologists are forecasters who monitor, review, analyze, and interpret weather information pertinent to the airways and air traffic terminals in the ARTCC area of responsibility. They prepare briefings, nowcasts, and forecasts to inform FAA area supervisors, traffic management coordinators, sector controllers, other supported FAA facilities, and the CFWSU meteorologists of any weather conditions or changes that may affect the safe flow of air traffic. This is done either directly or through the weather coordinator.

The CWSU meteorologists have the following responsibilities:

a. Provide detailed briefings of current and forecast weather conditions affecting the NAS for ARTCC and designated EFAS and/or control tower personnel at least once per shift. Additional briefings may be scheduled routinely or provided as conditions require.

b. Solicit Pilot Reports (PIREP), through the weather coordinator directly from the controllers, from known or suspected areas where conditions meet or approach advisory criteria. Solicited or unsolicited PIREP's meeting urgent PIREP criteria will be immediately relayed by the CWSU into the FAA's Leased Service A System (LSAS) for nationwide distribution. Other PIREP's will be relayed by the weather coordinator or, as higher priority duties permit, by the meteorologist.

c. Ensure that reports of conditions meeting Urgent PIREP criteria (including wind shear) reach the appropriate Weather Service Forecast Office(s) (WSFO), the National Aviation Weather Advisory Unit (NAWAU), and/or the CFWSU meteorologist via the LSAS or by telephone.

d. Relay Pilot Reports of conditions meeting Severe Weather Warning criteria to the NWS office with local warning responsibility via telephone.

e. Relay reports of winds meeting Winds Aloft Forecast amendment criteria to the appropriate WSFO for action.

f. Conduct weather training sessions for the ARTCC controllers, as workload permits.

g. Coordinate with the CFWSU or act as consultants to CFCF in situations where weather conditions impede the normal flow of traffic in their ARTCC area.

h. Issue forecasts and nowcasts [Meteorological Impact Statements (MIS) and Center Weather Advisories (CWA)] when conditions warrant.

i. Disseminate CWSU products and other specified pertinent weather intelligence (products and information) within the ARTCC to appropriate FAA facilities within the ARTCC area of responsibility and to other users when the weather coordinator position is not staffed.

j. Provide special, on-request Pilot Weather Briefings (PWB) to U.S. Government units (e.g., Air Force One), and courtesy PWB's to FAA pilot employees in or in contact with the ARTCC. These briefings will be provided only by CWSU meteorologists holding valid PWB certificates and as workload permits. Briefings will be conducted and documented in accordance with WSOM Chapter D-26. Weather consultation and advice (as opposed to a direct forecaster to pilot PWB) may also be provided to airborne pilots in contact with the ARTCC, either through appropriate ARTCC personnel or directly, during weather-related emergencies. Procedures for any direct forecaster to pilot communications must be clearly stated in the CWSU SDM. Any other PWB duties are <u>not</u> the function of the CWSU and will be referred to a Flight Service Station or National Weather Service Office.

4.1.4 <u>The Weather Coordinator</u>. While the CWSU meteorologists interact directly with NWS components, the weather coordinator is the designated interface between the CWSU meteorologist and the ARTCC controllers, FAA facilities within the ARTCC area of responsibility, and users to whom CWSU products are disseminated. The task of gathering and forwarding weather information into and out of the CWSU, as reflected by the duties listed in exhibit D-25-3, rests with the weather coordinator when that position is staffed. This will ensure that PIREP's are collected to enhance the CWSU information data base and are disseminated through the FAA LSAS; and that ARTCC tailored weather information is relayed to intra-facility positions and appropriate external FAA facilities and other users.

4.2 <u>Priority of Duties</u>. The CWSU weather coordinator and the CWSU meteorologist will operate as a team with each providing special skills for the enhancement of ARTCC operations. This team concept should result in a cooperative effort to fulfill the responsibilities and duties previously outlined. In the event that weather conditions and/or staffing deficiencies make it impossible to accomplish all of the assigned duties, the CWSU staff will use the list of duty priorities (exhibit D-25-3) to determine which tasks will be done first. It is recommended that a copy of this list be posted in the CWSU work area as a ready reference for the staff and for the information of ARTCC personnel. It should be emphasized that this list is not a <u>schedule</u> of tasks nor must the listed order of duties necessarily be reflected in task <u>schedules</u> as determined at the local level. The weather coordinator position, when staffed, will have primary responsibility for the duties indicated in

Center Weather Service Unit Priority of Duties

1. Prepare Center Weather Advisory (CWA) (LSAS dissemination)

& 2. Disseminate CWA within ARTCC

3. Provide weather consultation to airborne pilot in contact with ARTCC involved in a weather-related emergency

4. Coordinate with NWS office(s) issuing product(s) affected by CWA

5. Disseminate Pilot Report (PIREP) meeting urgent criteria (via LSAS)

6. Disseminate Urgent PIREP to appropriate NWS office(s)/unit(s) (if not accomplished by 5).

& 7. Disseminate Urgent PIREP within ARTCC

8. Prepare scheduled briefing

9. Deliver scheduled briefing for assembled ARTCC personnel

& 10. Disseminate CWA beyond the ARTCC (via other than LSAS)

11. Coordinate with NWS office(s) issuing product(s) affected by Meteorological Impact Statement (MIS)

12. Prepare MIS (LSAS dissemination)

13. Deliver scheduled briefing to dispersed ARTCC personnel and/or designated EFAS and control tower personnel

14. Provide special PWB to requesting U.S. Government unit (e.g., AF One)

15. Solicit/gather PIREP's or other weather intelligence

16. Prepare locally specified displays of time-critical conditions within or affecting the ARTCC area of responsibility

& 17. Disseminate Meteorological Impact Statement (via other than LSAS)

18. Disseminate nonurgent PIREP's

& 19. Disseminate other weather intelligence within the ARTCC as specified by local requirements

20. Provide courtesy Pilot Weather Briefing to FAA pilot employee

Exhibit D-25-3: Center Weather Service Unit Priority of Duties exhibit D-25-3 by the ampersand (&). These items will be of top priority with assistance from the meteorologist if other meteorologist's duties permit.

4.3 Briefings and Products. The CWSU will issue and disseminate briefings and products as detailed in this chapter and additionally as specified in the Station Duty Manual. The conditions described in these products will be restricted to those within the horizontal boundaries of the ARTCC's area of responsibility and will include all altitudes within these boundaries. Points used to describe the areal location and extent of these conditions should be the minimum number necessary to describe the area accurately. If appropriate, nearby points outside of the ARTCC area may be used to simplify the area shape or reduce the number of points required to describe where the conditions are occurring or expected. When the conditions described extend beyond the ARTCC's area, that fact should be included in the text especially for products available to pilots in flight.

All abbreviations and contractions used in CWSU products will be consistent with FAA Contractions Handbook 7340.1. Terms used will be consistent with WSOM Chapters D-20 and D-22. All times will be expressed numerically, e.g., "BY 01Z" will be used instead of "BY SUNSET" or "BY EVENING."

The issuance time of regularly scheduled briefings and products will be developed locally in consonance with the ATM or designee. The criteria, content, and sample alphanumeric formats of the national standard briefings and products are shown below. Graphic representations of these may be prepared and displayed within the ARTCC in addition to the alphanumeric version. If no operational use exists for the alphanumeric version of the briefings' content, then they need not be prepared.

Retention instructions contained in this chapter and in WSOM Chapter D-90 refer only to the alphanumeric versions of CWSU briefings and products. Redundant graphic versions need not be retained unless no operational use is made of an alphanumeric version of a product or briefing. Worksheets used to update briefings or to supplement other products also need not be retained.

All users of CWSU products should be kept aware of the fact that these products are not available 24 hours a day. This may be accomplished by adding the remark "LAST" to the end of those products which will be in effect when the unit's duty hours end.

4.3.1 Briefings. A CWSU briefing will consist of a discussion of current and forecast weather conditions relevant to the ARTCC area during the shift in which it is issued (generally 6 to 8 hours) and an outlook extending into the following shift or through the overnight off-duty hours period. Each briefing will contain as a minimum the information shown in the sample alphanumeric briefing format below. If no operational use exists for an alphanumeric version of the briefing content, any graphic version will contain the same information, appropriately labeled, and should be on the fewest possible number of separate sheets. The graphic version of the briefing, in this case will be retained (see section 4.8.1).

SECTION 4 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

Format

ARTCC Designator "CWSU BRIEFING" Date and time (GMT) issued - Date and time ending

a. MET Impact Statement - conditions meeting any nonconvective MIS criterion or thunderstorms (when issued at the same time as the briefing)

b. Synopsis - discussion of weather systems and their movements

c. General Weather and Outlook - flight conditions (weather, turbulence, icing, etc.), clouds, and visibility

d. Terminal Weather - for locally designated large hub airports, including surface winds even if below 10 knots. NOTE: The FAA has defined large hub as an area, city, or standard metropolitan statistical area where at least 1 percent of all scheduled air carrier passengers in the U.S. are enplaned.

e. Location(s) and speed(s) of jetstream(s)

f. Freezing Level

Example

ZHU CWSU BRIEFING 252145-261000

MET IMPACT STATEMENT...SCT EMBEDDED TSTMS ACROSS ZHU AREA FM SRN TX TO FL WILL

CONTINUE NEXT FEW HOURS WITH ISOLATED EMBEDDED TSTMS TOPS AROUND 500 WITHIN 50

MILE RADIUS OF MSY. TSTMS WILL DECREASE RAPIDLY AFTER 00Z.

SYNOPSIS...STNRY FNT EXTDS FM TX PNHDL NR AMA TO LOW PRES SYS OVR SRN AR

THEN EWD ACRS KY AND NC INTO ATLC OCEAN. HI PRES SYS CNTRD OVR NY.

GENERAL WEATHER...CLDS 20-50 SCT OCNLY BKN WITH SCT TSTMS SRN TX TO FL GENLY

30 TO 130 MILES INLAND MOVG NWWD AT 10-15KTS. TOPS IN STRONGEST TSTMS

LOCATED OVR SRN LA AND MS ARE ABV 500.

OTLK 05Z-10Z...VFR XCPT PTCHY GF AFT 08Z.

TERMINALS...HOU/IAH AND NEW/MSY 20-40 SCT OCNLY BKN 120 BKN 250 BKN-OVC 2206

CHC 20 OVC 2TRW+ G35. AFT 02Z 120 SCT XCPT PTCHY 2-5GF AFT 08Z.

JETSTREAM...50-70 KT JET EXTENDS FM CNTRL OH NEWD TO ME.

FREEZING LVL...140-150.

4.3.2 Meteorological Impact Statement. An MIS is an unscheduled flow control and air traffic/flight operations planning forecast. It describes conditions expected to begin generally 4 to 12 hours after issuance or conditions existing at the time the briefing is issued or when CWSU operations begin if they will persist for at least 3 hours. It is an air traffic oriented forecast product intended for those personnel at ARTCC, CFWSU/CFCF, and large hub terminal air traffic facilities responsible for making flow control and flow control related decisions. It will enable them to include the impact of expected locally and/or nationally specified weather conditions in those decisions. As a minimum, an MIS will be issued when:

a. any of the following conditions occur or are forecast to occur

1. Conditions meeting Convective SIGMET criteria (see WSOM Chapter D-22)
2. Icing - moderate or greater
3. Turbulence - moderate or greater
4. Heavy precipitation
5. Freezing precipitation
6. Conditions at or approaching low IFR (WSOM Chapter D-21)
7. Surface winds (including gusts) 30 knots or greater
8. Low level wind shear (within 2,000 feet of the surface)
9. Volcanic ash, dust storms, or sandstorm; and

b. the conditions listed above will, in the forecasters judgment, impact the flow of air traffic within the ARTCC area of responsibility; and

c. the forecast lead time (the time between issuance and onset of a phenomenon), in the forecasters judgment, is sufficient to make issuance of a CWA unnecessary or premature.

The statement will describe the location of the phenomenon, using ARTCC relevant points of reference (e.g., VOR's) and including the height, extent, intensity, and movement. MIS issuances will be numbered sequentially beginning at midnight local time each day. Forecasters should be aware that the MIS is disseminated and stored as a replaceable product. This means that each issuance must contain the details of all pertinent, known conditions meeting MIS issuance criteria including continuing conditions described in previously issued MIS's.

The statement will be distributed to ARTCC area supervisors and traffic management coordinators and entered through FAA LSAS and other communications media so that it will be available for dissemination to FAA and NWS facilities including adjacent CWSU's, the CFWSU, and locally designated hub terminal facilities. Distribution may be directly by the CWSU meteorologist or through the weather coordinator. When an MIS is issued concurrently with a briefing, it will be distributed to those media and facilities mentioned above which do not receive an alphanumeric version of the briefing's contents.

Format

ARTCC Designator "MIS" issuance number Date and time (GMT) issued - Valid-until date and time (GMT)

TEXT

Example

ZJX MIS 02 111245-120100

SCT LVL 3 AND 4 TSTMS ALG N-S RTES S OF ILM AND E OF SAV-OMN LN DVLPG BY 16Z. MAX TOPS 350-400. ELSW ZJX AREA LVL 3 AND 4 TSTMS FRMG IN SHRT LNS OR CLUSTERS AFT 17Z WITH FEW RCHG LVL 5-6. CELLS MOVG GENLY SEWD 10 KTS CONT THRU 00Z. CONDS LWRG OCNLY TO LIFR IN HVY PCPN AFT 17Z.

The format of the MIS communications header above and in the CWA format below must be followed exactly if the products are to be disseminated through the LSAS.

4.3.3 Center Weather Advisory (CWA). The CWA is an unscheduled in-flight flow-control, air traffic, and air crew advisory. It is for the guidance of the ARTCC personnel, air crews in flight, designated FAA facilities, and CWSU meteorologists for use in anticipating and avoiding adverse weather conditions in the en route and terminal environments. By nature of its short lead time, the CWA is not a flight planning product. It is generally a Nowcast for conditions beginning within the next 2 hours and also should reflect the weather conditions in existence at the time of issuance. If conditions are expected to persist beyond the valid period of the advisory, a statement to that effect should be included in the last line of the advisory text and additional CWA's issued. If conditions extend beyond the ARTCC area, a statement to that effect should be included in the text.

Each CWA will have a phenomenon number (1-6) immediately following the ARTCC identifier. A number will be assigned to each meteorologically distinct condition (e.g., jetstream Clear Air Turbulence) or group of conditions (e.g., low IFR and icing northwest of a low center) meeting CWA issuance criteria. This will make it possible to store and disseminate CWA's for up to six unrelated conditions with each capable of being individually updated. The CWA will contain an issuance time and a valid-until time in the heading line. The difference between the two will not exceed 2 hours.

CWA issuances for each phenomenon will be sequentially numbered starting at midnight local time each day. The headers of CWA's that are based on existing nonconvective SIGMET's or AIRMET's will include the associated alphanumeric designator (e.g., JULIETT 4) following the issuance number of the CWA and a solidus (/). Each CWA will be disseminated, either directly by the CWSU meteorologist or through the weather coordinato, to the affected ARTCC sectors and terminal facilities for broadcast and to the LSAS. A hard copy of each CWA will be time stamped after dissemination.

There are three situations in which a CWA could be issued:

a. The CWSU meteorologist <u>will</u> issue a CWA:

1. As a supplement to an existing SIGMET (including Convective SIGMET), AIRMET, or Area Forecast (FA) section. The issuance of a CWA in this circumstance should be limited to those occasions, when, in the judgment of the CWSU meteorologist, a redefining statement, update, or advanced amendment is adequately supported by real-time information. Such information regarding the phenomenon covered by the NAWAU product may be in the form of pilot reports, radar, satellite, or information from other sources. The purpose of the CWA, in this case, is to improve or update the definition of the phenomenon in terms of relevance to users within the ARTCC area, location, movement, extent, and/or intensity. For an IFR AIRMET, for example, a CWA describing the area(s) of low IFR (LIFR) conditions in terms of ARTCC reference points would be a valid redefinition of the location and "intensity" relevant to the ARTCC's area and meeting documented requirements.

2. When an In-flight Advisory has not yet been issued but observed or expected weather conditions meet SIGMET/AIRMET criteria based on current pilot reports and reinforced by other sources of information about existing meteorological conditions. In this situation, the CWSU meteorologist should call the appropriate forecaster at the NAWAU or appropriate Alaska WSFO. If the CWSU forecaster determines that it is necessary to issue a CWA to allow lead-time while the SIGMET/AIRMET is being prepared, the CWA will be issued and should indicate that a SIGMET/AIRMET will be issued shortly.

b. The CWSU meteorologist <u>may</u> issue a CWA:

When observed or developing weather conditions do not meet SIGMET (including Convective SIGMET) or AIRMET criteria, e.g., in terms of intensity or areal coverage, but current pilot reports or other weather information sources indicate that an existing or anticipated meteorological phenomena will adversely affect the safe flow of air traffic within the ARTCC area of responsibility. In this situation the data available must be sufficient, in the judgment of the CWSU meteorologist, to support both the issuance of such an advisory and, if necessary, its continuation.

<u>Format</u>

ARTCC Designator and Phenomenon number (numbers 1-6 for replaceability) "CWA" issuance number (two digit)/In-flight Advisory alphanumeric designator (if applicable) Date and Time (GMT) issued - Valid-until date and time

TEXT

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00103 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Examples

ZOB3 CWA 01 032141-032300

LN LVL 5 AND 6 TSTMS 10S DET TO 40N DJB TO 40 E SBN TO 80SE MKG MOVG FROM 2525. 3/4 INCH HAIL RPRTD LAST 5 MINS 20 SW YIP. LVL 4-6 TSTMS CONTG DTW AREA BYD 2300.

ZKC1 CWA 01/ALFA 4 121528-121728

NMRS RPTS OF MDT TO SVR ICG 080-090 30 MILE RADIUS OF STL. LGT OR NEG ICG RPTD 040-120 RMNDR OF ZKC AREA AND NE OF AREA.

4.4 Forecast Coordination. Frequently the forecast products issued by the NAWAU, national centers, or WSFO's and the CWSU, will address the same event within the same area and time period. Maximum coordination between the responsible offices prior to CWA issuance is essential in these cases to avoid confusion and avert any possible negative impact on aviation safety. To ensure adequate forecast coordination, the CWSU forecasters will communicate with WSFO's and national centers to discuss those CWSU products (i.e., CWA's or MIS's) to be issued as preliminary advisories or advanced amendments to scheduled Area or Terminal Forecasts, In-flight advisories, watches, warnings, or bulletins. This is particularly important when those products concern unexpected or suddenly changing weather conditions. A CWA may be issued before coordination:

a. when time is of the essence and meteorological phenomena have an immediate effect on the safe flow of air traffic within the ARTCC area of responsibility or

b. in other situations where meteorological phenomena affect the flow of air traffic but are not currently meeting or approaching In-flight Advisory criteria.

The NAWAU and the Alaska WSFO's have the final responsibility for issuing Area Forecasts and In-flight Advisories and thus their concurrence in the issuance of CWA's amending or preceding one of their products is highly desirable. The concurrence of WSFO's with Terminal Forecast (FT) responsibility for large hub area airports is likewise desirable before the issuance of a CWSU product which implies an amendment to that FT. In situations where a CWA has been issued prior to coordination, notification of the NAWAU or appropriate NWS national center or WSFO must follow as soon as higher priority duties permit.

A CWA issuance for conditions not meeting In-flight Advisory criteria, while generally based on those criteria, is primarily due to the forecaster's recognition that a condition is having a negative impact on the safe flow of air traffic. Prior coordination with the NAWAU in this situation should take place if the CWA indicates a trend towards an In-flight Advisory criterion. Other NWS offices and/or units whose product(s) may be impacted by the CWA also should receive prior notification of the issuance, if time permits. In either case the CWSU forecaster has the final responsibility for issuing a CWA.

All users and forecasters should understand that every In-flight advisory does not require a CWA. Also, every product for which a CWA is issued does not require amendment by the originating office. The guidelines and authorizations in this chapter do not affect the amendment instructions for various products contained in other WSOM chapters. Regardless of whether coordination has yet been accomplished, CWSU products will be relayed to the appropriate intra- and inter-facility communications system(s) as valid updates or amendments of the relevant products. They will remain valid unless and until canceled by the CWSU or superseded by subsequent issuances from the responsible NWS unit, national center, or office. CWA's not issued in relation to any other product will be disseminated as valid weather advisories. CWSU products are immediately available for all dissemination methods including radio broadcasts by ARTCC, FSS, and terminal facility personnel.

4.5 Relationship of CWSU to FSS. Each CWSU acts as a source of meteorological expertise to specific Flight Service Stations, including those with EFAS positions, when weather conditions impede or threaten the normal flow of air traffic. However, pre-shift briefings for FSS personnel will not normally be done by the CWSU. These, and routine weather support, remain the responsibility of designated weather service forecast offices or weather service offices. This ensures that the link with an NWS facility capable of providing full-time support will remain clear cut. Close cooperation should exist, however, between the CWSU and EFAS (Flight Watch) staffs since on-duty CWSU meteorologists will be continuously aware of any aviation weather forecast problems and EFAS specialists have access to additional sources of PIREP information. In addition, any requests, for Pilot Weather Briefings received by the CWSU from outside the ARTCC and any from within the center which workload prohibits, will normally be referred to the FSS.

4.6 Relationship of CWSU to the WSFO/Area Manager and Region. The CWSU meteorologists are under the supervision of the CWSU MIC whose first line supervisor is the NWS area manager (AM) whose area of responsibility includes the operating location of the CWSU. The AM's FAA contact at the ARTCC is the ATM or an appropriate designee. Technical guidance and support for the CWSU is also the responsibility of the AM who may designate the Weather Service Evaluations Officer (WSEO) as the focal point for this activity. It is expected that the AM or designee will maintain a working level familiarity with the CWSU's operations and will therefore be in a position to adequately support the technical and coordination requirements of the CWSU with other NWS facilities. Semiannual visits to the CWSU should be made by the WSEO. A written report of each visit should be sent to the Regional Aviation Meteorologist (RAM) (or the regional official in an equivalent position) through the AM with copies to the CWSU MIC and the ATM. The NWS contact, for operational policies or practices which imply or require departures from the instructions in this chapter or those in the approved CWSU SDM, is the RAM (or equivalent) of the region in which the CWSU is located. The RAM will consult with the appropriate CWSU MIC on any proposed variances and will advise NWS Headquarters, Aviation Services Branch prior to implementation.

4.7 Station Duty Manual (SDM). All CWSU's will maintain an SDM in accordance with existing NWS directives. The SDM is developed in consonance with the ATM or appropriate designee and will contain all guidelines and instructions for meeting national and agreed to local requirements. No variations in the national standards will be implemented without prior approval (see Section 4.6).

A copy of all SDM's should be on file with the NWS area manager having administrative responsibility. A copy will be forwarded to the Regional Aviation Meteorologist (or equivalent) for review, to ensure that basic minimum requirements are met and that CWSU operations within the region are as standardized as local ARTCC requirements permit. Regional and area manager approval of all SDM's are required. Review and approval of SDM changes or amendments are required prior to implementation. A historical SDM file will be maintained at the WSFO having administrative responsibility for the CWSU. Retention of superseded and/or canceled portions of the SDM in this file will be in accordance with WSOM Chapters A-13 and D-90 and any applicable subsequent issuances.

4.8 Handling of Weather Records.

4.8.1 Retention. All written records composed at CWSU's (shift briefing texts/content, MIS's, and CWA's) will be retained by the unit for 1 month and then mailed to the WSFO that has administrative responsibility for the unit. It will be retained for 5 years at that office. Daily Record of Facility Operation (FAA 7230.4 or equivalent) sheets will be retained at the CWSU for 90 days. FAA retention of copies of this record is the responsibility of the ATM.

4.8.2 Protection of Records. All requests for certified copies of weather exhibits prepared by the CWSU meteorologists and all requests for uncertified copies from anyone other than the management of the assigned ARTCC should be directed to the retaining WSFO. Requests coming during the 30-day CWSU retention period will still be processed through the WSFO. In the event of an accident (within the area of responsibility of the ARTCC facility), retention procedures described above will be followed unless otherwise requested by the Aviation Safety and Evaluation (ASE) Program Leader, NWS Headquarters. In the event of a major accident, all pertinent products prepared by the CWSU meteorologists and other pertinent observations, charts, and forecasts available to the CWSU meteorologists should be forwarded to the appropriate AM as soon as possible. These records will be protected and retained in the WSFO for at least 1 month to provide time for determining:

a. to what extent weather is a factor, and/or

b. what weather information will be required for investigation purposes.

After this period, normal retention procedures will be followed unless the ASE Program Leader requests otherwise. The definition of a major accident is contained in WSOM Chapter D-90.

4.8.3 Statements. No written statements by CWSU meteorologists concerning a system incident, or an aircraft incident or accident, will be provided to offices, agencies, organizations, or individuals (government or public) outside of the NWS without the approval of the ASE Program Leader. Any such statements will concern only the meteorological facts and must be reviewed by the appropriate regional headquarters and the ASE Program Leader. The statement may also be forwarded to the NOAA General Counsel before being furnished to the requester. When a written statement is prepared, one copy will be forwarded to regional headquarters through the NWS AM. A second copy will be forwarded directly to the ASE Program Leader.

The comments of CWSU meteorologists are not a matter of public record. There is no requirement that anyone other than members of a government investigation team be allowed to question or interview personnel in connection with an aircraft accident. When an accident has occurred and the details are being discussed by persons outside of the NWS; or when being questioned or interviewed in connection with an accident, NWS personnel should attempt to determine that their verbal comments are not being recorded. Should a request to record such comments be made it will be referred to the ASE Program Leader. Any such arrangements will be made at the regional or NWS headquarters level.

5. Weather Service Forecast Office (WSFO). The WSFO will provide meteorological support to the ARTCC through the CWSU. During CWSU off-duty hours, WSFO support will be through the weather coordinator ATM or appropriate designee.

Open lines of communication must be maintained between the WSFO's, CWSU's, FSS's, and towers within the ARTCC area to ensure the timely exchange of necessary weather information. The NWS area manager has the responsibility to monitor and evaluate the various links between the relevant NWS and FAA facilities. This may be delegated to the WSEO. Any deficiencies will be documented and forwarded to the RAM (or equivalent) either as part of a WSEO station visit report (with appropriate distribution) or as a separate memo with copies to the supervisors of the NWS and FAA facilities or units involved. Attempts to remedy any deficiencies should be made at the local level. However, if all else fails, the problem should be brought to the NWS regional or headquarters level where steps will be taken to ensure that the requirements and responsibilities placed on an NWS facility will be reduced to a level that available communications can support.

SECTION 5 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

Included in the communications capabilities should be links that will allow the designated WSFO or WSO to:

a. provide CWSU and/or FSS pre-shift briefings as per local arrangements;

b. assist the ARTCC during in-flight emergencies when a pilot could be involved in a critical weather situation (if CWSU is not in operation); and

c. provide ARTCC with critical weather updates (if CWSU is not in operation).

All NWS forecasts (FA's, FT's, advisories, warnings, etc.) will be received at the ARTCC via the Weather Message Switching Center (WMSC). The WSFO will give the following weather information to the CWSU or to the weather coordinator when CWSU meteorologists are not on duty:

Terminal Weather – A forecast of heavy snow, freezing precipitation, or low IFR ceiling and/or visibility conditions which may disrupt landing/takeoff operations at large hub area airports is cause for alerting the relevant CWSU/ARTCC. During CWSU off-duty hours, the WSFO should notify those control tower facilities to which direct communications (e.g., Hotlines) have been provided.

6. <u>NWS Support Facilities for CFWSU/CWSU.</u> The NWS support facilities listed below are available to CFWSU and to CWSU's for consultation.

a. National Meteorological Center — Aviation Weather Branch;
b. National Severe Storms Forecast Center;
c. National Aviation Weather Advisory Unit (or Alaska WSFO's);
d. National Hurricane Center; and
e. Eastern Pacific Hurricane Center (WSFO San Francisco).

CFWSU will be the usual CWSU interface with the national centers; however, because of the direct availability of PIREP's at the ARTCC's, a national center or unit may contact the CWSU directly for real-time data.

6.1 <u>National Meteorological Center (NMC), Aviation Weather Branch.</u> NMC provides routine aviation guidance forecasts of cloud cover, ceilings, visibilities, turbulence, icing, and wind. This guidance includes Clear Air Turbulence forecasts that can be refined through the timely receipt of PIREP's.

6.2 <u>National Severe Storms Forecast Center (NSSFC).</u> NSSFC is responsible for issuing messages concerning expected severe local storms, including tornadoes. NSSFC alerts CFWSU of impending Severe Weather Watches.

6.3 <u>National Aviation Weather Advisory Unit (NAWAU).</u> NAWAU issues aviation area forecasts, nonconvective In-flight Advisories (AIRMET's and

SIGMET's) and hourly and special Convective SIGMET's when conditions warrant (see WSOM Chapter D-20 and D-22). This unit must closely interact with CWSU's both for requesting and receiving PIREP's and for coordination of NAWAU and CWSU products.

The NAWAU will also give the following weather information to the CFWSU or the CFCF shift supervisor for relay to the appropriate CWSU or to the weather coordinator when CWSU meteorologists are not on duty:

Pressure Trends - NAWAU should notify CFWSU/CFCF whenever significant pressure changes are expected. A pressure change is considered to be significant when the surface pressure change equals one-half inch of mercury (approximately 17 millibars) or more during an 8-hour period. This information will be used to alert controllers to changes in the lowest usable flight level above 18,000 feet. See exhibit D-25-4.

In Alaska, WSFO's issue Area Forecasts and/or In-flight Advisories and must provide support equivalent to that provided by NAWAU.

6.4 National Hurricane Center (NHC). NHC has tropical storm and hurricane forecast and warning responsibility for the Atlantic, Caribbean, and Gulf of Mexico. Part of its warning responsibility is delegated to Hurricane Warning Offices at Boston, Washington, and San Juan. The Eastern Pacific Hurricane Center at San Francisco is responsible for tropical storm warnings for the Eastern Pacific Ocean from 140 West longitude to the West Coast of the U.S. The tropical storm and hurricane advisories are issued routinely every 6 hours, as warranted. The CWSU may consult directly with the appropriate hurricane center concerning tropical storms and hurricane advisories which could directly impact their ARTCC area of responsibility.

6.5 Satellite Services Unit (SSU). SSU's located at Washington, DC; Miami, FL; New Orleans, LA; Kansas City, MO; San Francisco, CA; Anchorage, AK, and Honolulu, HI, are available to support the CFWSU and CWSU's. This support is in two forms. First, the SSU is responsible for transmitting Geostationary Operational Environmental Satellite (GOES) photos and also preparing and distributing Satellite Interpretation Messages (SIM) four times daily (except Miami) with updates as required. Second, the SSU provides a consultation service to the CWSU on a real-time basis to discuss developing weather as viewed from satellites.

The CWSU meteorologist should contact the SSU when assistance is required. However, the SSU may take the initiative to contact the CWSU when the SSU meteorologist sees a development known to be of operational concern to the CWSU. Because of the direct availability of PIREP's at the ARTCC, the SSU may also contact the CWSU directly for real-time data.

91.81 Altimeter Settings.

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating --

(1) Below 18,000 feet MSL, to--

(i) The current reported altimeter setting of a station along the route within 100 nautical miles of the aircraft; (ii) If there is no station within the area prescribed in subdivision (i) of this subparagraph, the current reported altimeter setting of an appropriate available station; or (iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure; or

(2) At or above 18,000 feet MSL, to 29.92" Hg.

(b) The lowest usable flight level is determined by the atmospheric pressure in the area of operation, as shown in the following table:

Current Altimeter Setting	Lowest Usable Flight Level
29.92 (or higher)	180
29.91 thru 29.42	185
29.41 thru 28.92	190
28.91 thru 28.42	195
28.41 thru 27.92	200
27.91 thru 27.42	205
27.41 thru 26.92	210

(c) To convert minimum altitude prescribed under §§91.79 and 91.119 to the minimum flight level, the pilot shall take the flight-level equivalent of the minimum altitude in feet and add the appropriate number of feet specified below, according to the current reported altimeter setting:

Current Altimeter Setting	Adjustment Factor
29.92 (or higher)	NONE
29.91 thru 29.42	500 feet
29.41 thru 28.92	1000 feet
28.91 thru 28.42	1500 feet
28.41 thru 27.92	2000 feet
27.91 thru 27.42	2500 feet
27.41 thru 26.92	3000 feet

Exhibit D-25-4: Federal Aviation Regulation Part 91, Para. 91.81 - Altimeter Setting

*U.S. GOVERNMENT PRINTING OFFICE : 1984 O-421-428/252

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00110 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

CHANGE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

7210.3RA CHG 1

5/30/90

SUBJ: CENTER WEATHER SERVICE UNIT (CWSU)

1. PURPOSE. Restates the requirement for the establishment of the Center Weather Service Unit (CWSU) and the national standard operating procedures for Federal Aviation Administration personnel and National Weather Service (NWS) meteorologists assigned to a CWSU.

2. PRINCIPAL CHANGE. Adds a provision to amend meteorologist shift hours to provide coverage during hazardous weather conditions.

3. DISPOSITION OF TRANSMITTAL. After filing the revised pages, this change transmittal should be retained.

PAGE CONTROL CHART

Remove Pages	Dated	Insert Pages	Dated
i (and ii)	4/6/84	i (and ii)	5/30/90
3 and 4	4/6/84	3 and 4	5/30/90
7 (and 8)	4/6/84	7 (and 8)	5/30/90

John D. Canoles
Acting Director, Air Traffic
Rules and Procedures Service

Distribution: A-W(AT/TO/TR/TH)-3; A-X(AT)-3; A-FAT-1 (MAX)
A-FAT-2,4,5,6,7,8 (LTD)
Initiated By: ATP-130

#3

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-803
September 3, 2008

Operations and Services
Aviation Weather Services, NWSPD 10-8
SUPPORT TO AIR TRAFFIC CONTROL FACILITIES

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/OS23 (B. McNulty) **Certified by:** W/OS23 (K. Johnston)

Type of Issuance: Routine

SUMMARY OF REVISIONS: Supersedes NWSI 10-803 "Support to Air Traffic Control Facilities" dated June 13, 2006. This instruction details the procedures NWS Weather Forecast Offices (WFOs), Alaska Aviation Weather Unit (AAWU), and Center Weather Service Units (CWSUs) use to provide weather support to the Federal Aviation Administration (FAA) Air Traffic Control Facilities. The changes made include:

1. Extensive revision to reflect initiatives to improve support to air traffic control facilities. Paragraphs and subsections were rearranged to reflect a logical progression of information, and renumbered as necessary.

2. Revised chapter 6: moved background information to chapter 3 and emphasized lines of authority.

3. Revised chapter 7: eliminated a discussion of product headers; added guidance of when center weather advisories are needed; emphasized forecast coordination and introduced work products to help that function; and updated subsections dealing with forensic requirements.

4. Deleted section 7.1 (Priority of Duties) and the associated Appendix C, and section 7.7 (Dissemination of PIREPS) as duplicates of the new section 5.2.

5. Added Appendix E.

6. December 4, 2008: Corrected CWSU associated with Tampa International Airport from Jacksonville to Miami (Appendix E).

//Signed// August 20, 2008
David Caldwell Date
Director, Office of Climate, Water, and Weather Services

Table of Contents

Appendices

1. **Purpose.** This directive provides general procedures for National Weather Service (NWS) meteorological support to Federal Aviation Administration (FAA) Air Traffic Facilities. Specific guidelines are provided for NWS participation in jointly (FAA/NWS) operated weather service facilities.

2. **General.** NWS support is designed to improve aviation safety and enhance efficient flow of air traffic by forecasting and monitoring adverse weather. Efficiency is affected by maintaining close coordination with traffic managers whose decisions affect the flow of air traffic through the National Airspace System (NAS).

3. **Background**. NWS meteorologists in Center Weather Service Units (CWSU) and FAA Traffic Management Unit (TMU) specialists are components of joint FAA/NWS units directly supporting the FAA's 21 Air Route Traffic Control Centers (ARTCC). NWS personnel work as a team with FAA Air Traffic Control (ATC) specialists assigned to the TMU. These TMU specialists are the designated interface between CWSU meteorologists and ARTCC controllers, FAA facilities within the ARTCC area of responsibility, and CWSU product users. They provide information critical to the safe and efficient flow of air traffic and serve the NAS directly. CWSU forecasters provide meteorological consultation, forecasts, and advice to ARTCC managers, staff, and other supported FAA facilities and activities, regarding weather impact on their missions, equipment outages and repairs, and FAA staffing. In the event that assigned resources make it impossible to accomplish all of the assigned duties, the CWSU staff should work with the TMU, and refer to the local Station Duty Manual (see NWSI 10-1608 *Station Duty Manual)* for guidance, to determine which task(s) are most important.

CWSU staff members provide meteorological training for ARTCC personnel. The CWSU is also the liaison between FAA facilities and other NWS offices in its area. CWSU meteorologists may assist in the distribution of weather forecasts, advisories, and warnings issued by other NWS offices. Complete details of the relationship between the FAA and the CWSU are contained in an interagency agreement.

Weather support is accomplished through various products and verbal briefings describing weather conditions (forecasts or observations) which may affect air traffic flow or operational safety in the ARTCC's portion of the NAS (the CWSU area of responsibility), and in other locally-defined, special operations areas (e.g., offshore helicopter operations areas). Additionally, the CWSU provides advisories of hazardous weather conditions for airborne aircraft. These advisories are disseminated through NWS and FAA communications systems and are available to both internal FAA and external aviation users. The CWSU meteorologists must remain cognizant of FAA requirements and procedures to adequately perform these tasks.

4. **Air Traffic Meteorological Concerns**. Aviation operations impacted by adverse weather places increased demands on the FAA Air Traffic resources that facilitate safe and efficient use of airspace and airports. FAA personnel need the best weather information available to enhance their mission of supporting aviation operations. Required weather information includes, but is not limited to, the following:

a. Convective weather including thunderstorm timing, tops, movement, intensity, and character such as broken and solid lines or large clusters

b. Operationally significant ceilings/visibility

c. Cloud tops

d. Winds and temperatures, surface and aloft

e. Wind shear

f. Operationally significant pressure changes

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00114 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

g. Precipitation

h. Turbulence

i. Icing

j. Volcanic ash

The specific operational situation dictates the significance of any particular aviation weather phenomenon.

5. Support to Air Traffic Facilities.

5.1 Air Traffic Facilities.

a. ARTCC. ARTCCs provide ATC service to aircraft operating on Instrument Flight Rules (IFR) flight plans within controlled airspace, principally during the en route phase of flight. When equipment capabilities and controller work load permit, certain advisory and assistance services may also be provided to Visual Flight Rules (VFR) aircraft.

The Air Traffic Manager (ATM), or designee, of each ARTCC has operational responsibility for the collocated CWSU. The ATM, or designee, oversees CWSU operations and brings any special local weather support requirements to the attention of the CWSU Meteorologist in Charge (MIC).

b. TMU. The TMU in an ARTCC is responsible for the management of facility air traffic. The TMU is usually under the direct supervision of an assistant manager for traffic management.

c. Airport Traffic Control Tower (ATCT). The ATCT is an airport terminal facility which uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport. The ATCT authorizes aircraft to land or take off at the airport it controls or to transit the associated airspace regardless of flight plan or weather conditions. An ATCT may also provide approach control services (radar or non-radar).

d. Terminal Radar Approach Control (TRACON) Facility. The TRACON is a terminal ATC facility usually located within the vicinity of an airport. The TRACON controls approaching and departing aircraft between 5 and 50 miles of the airport.

e. Automated Flight Service Station (AFSS) and Flight Service Station (FSS). The AFSS and FSS are air traffic facilities providing aviation services such as:

(1) Pilot weather briefing (PWB)

(2) En route communications

(3) VFR search and rescue services

(4) Assistance to lost aircraft and aircraft in emergency situations

(5) Relay of ATC clearances

(6) Pre-flight and in-flight advisory broadcasts, and other services to pilots, via air/ground communications facilities

Selected AFSSs also provide En Route Flight Advisory Services (EFAS) which are specifically designed to exchange timely weather information directly with en route pilots.

5.2 **CWSU Support.** The CWSU meteorologist provides direct support to ATC operations. The CWSU meteorologist:

a. Provides meteorological forecasts, information and briefings in support of ATC operations during weather-related emergencies;

b. Issues Center Weather Advisories (CWA) and Meteorological Impact Statements (MIS) as conditions warrant;

c. Solicits and collects pilot reports (PIREPs) through the ATC work force;

d. Relays reports of conditions meeting specific urgent PIREP criteria. More information on PIREPs is available in NWSI 10-804, *Pilot Reports*.

e. Issues collaboration work files on aviation forecasts and TAFs;

f. Participates in discussions with ATC personnel as required, and with Air Traffic Control System Command Center (ATCSCC) personnel as requested;

g. Provides weather forecasts and briefings for appropriate ATC personnel as required. This includes participation in collaborative decision making sessions, such as the Collaborative Convective Forecast Product (CCFP).

h. Provides meteorological forecasts and information to pilots in contact with the ARTCC through appropriate ARTCC personnel;

i. Assists in backing up an adjacent CWSU if requested (see Appendix B); and

j. Conducts weather training and product familiarization sessions for ARTCC personnel as work load permits.

l. Coordinates duty priorities with the ARTCC and TMU.

5.3 **WFO, and Alaska Aviation Weather Unit (AAWU) Support.** WFOs (and AAWU for Alaska) provide direct meteorological support through advice and consultation to the TMU when CWSU meteorologists are not on duty. Other FAA facilities (ATCTs) are directly supported In Accordance With (IAW) local agreements. Support consists of:

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00116 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

a. Providing CWSU and/or AFSS and FSS shift briefings.

b. Assisting the CWSU and ARTCC during in-flight emergencies.

c. Providing ARTCC with forecast services and critical weather updates through the normal suite of aviation products when the CWSU is closed.

d. Providing Information Technology (IT) and IT security support. NWS Regional Headquarters (RH) may choose to provide this support for CWSUs in their local area.

NOTE: WFO Honolulu provides Pacific Region support equivalent to the Aviation Weather Center (AWC). For their area of responsibility, WFO Honolulu issues FAs, SIGMETs, and AIRMETs. Alaska in-flight weather is coordinated and disseminated by the Alaska Aviation Weather Unit (AAWU). Refer to NWSI 10-811 *Enroute Forecasts and Advisories* for more detail.

6. CWSU Lines of Authority. The supporting WFO's MIC is the first line supervisor of the CWSU MIC and is responsible for providing administrative and training support to NWS personnel at the CWSU. In Alaska, the AAWU MIC is the first line supervisor of the CWSU's MIC. The supporting MIC's FAA contact at the ARTCC is the ATM or their designee. The supporting MIC should ensure all WFO forecasters are aware of CWSU services and have a general knowledge of ARTCC meteorological needs. Forecaster exchanges between WFOs and CWSUs are encouraged. Further, NWS meteorologists are encouraged to visit ARTCCs, ATCTs, TRACONs, and AFSS/FSSs as part of their aviation training.

Open lines of communication must be maintained between FAA facilities and NWS aviation weather support units within the ARTCC's area to ensure timely exchange of necessary weather information. The supporting MIC or their designee monitors and evaluates the various links between relevant NWS and FAA facilities. Service, product, data, or data exchange deficiencies should be documented and forwarded to the respective NWS Regional Meteorological Services Division (MSD) or their equivalent (known hereafter as regional MSD), as either part of a station evaluation report (with appropriate distribution) or as a separate memorandum with copies to the supervisors of the NWS and FAA facilities or units involved. Initial attempts to remedy deficiencies should be made at the local level. Problems not resolved locally should be brought to the regional or NWS Headquarters (NWSH) level for resolution.

The supporting MIC or their designee should make semi-annual visits to the CWSU, and send a written report of each visit to the regional MSD with copies to the CWSU MIC, the ARTCC ATM, and Aviation Services Branch of the Office of Climate, Water, and Weather Services (OCWWS), NWSH.

6.1 CWSU MIC Responsibilities. The CWSU MIC is the first line supervisor for assigned CWSU meteorologists. In this position, the CWSU MIC:

a. Serves as NWS liaison to the supported ARTCC and is responsible for ensuring all CWSU services are provided to the FAA;

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00117 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

b. Has oversight of CWSU service obligations, labor-management relations, meteorological training for CWSU staff, and specified training for ARTCC staff;

c. In agreement with the ARTCC ATM (or a designee with responsibility for CWSU operational oversight), establishes CWSU meteorologist duty hours and implements procedures and policies detailed in this instruction and compatible or approved alternate instructions to meet special local requirements; and

d. Works with the ARTCC ATM to arrange access to office supplies, internet and voice communications, and other day-to-day necessities for the CWSU office.

On occasion, it may be necessary to temporarily change or amend the CWSU meteorologist's duty hours. Two examples of when duty hours may need changing: a staff shortage due to illness or vacant positions. These changes may be requested by the FAA ARTCC ATM or CWSU MIC.

If the request for change is from the local FAA ARTCC ATM, the CWSU MIC should ask for written notice of the proposed changes and coordinate this request with the supporting WFO/AAWU MIC to determine if resources allow the change in hours. If the two MICs agree the resources are available, the duty hours may be changed. The CWSU MIC should send a letter detailing all aspects of the duty hours change to the region MSD or their equivalent, who may forward a copy to the Office of Climate, Water, and Weather Services (OCWWS), NWSH as needed.

If the CWSU MIC requests a permanent change in the meteorologist's duty hours, the CWSU MIC should send a letter to the FAA ARTCC ATM and the supporting WFO/AAWU MIC, explaining why the change is needed. If all parties agree, the hours may be changed. The CWSU MIC should send a letter detailing all aspects of the change in duty hours to the regional MSD, who may forward a copy to OCWWS, NWSH as needed.

7. <u>CWSU Operations and Products</u>.

7.1 <u>Product Preparation</u>. CWSUs issue and disseminate forecasts and products, and conduct briefings as detailed in this and other applicable NWS instructions. Conditions described in these products are generally restricted to those within the boundaries of ARTCC airspace.

Products generated for local dissemination and use describing conditions outside the CWSU's area of responsibility may be prepared if, in the meteorologist's judgment, sufficient information and resources are available. However, meteorologists should first contact the CWSU responsible for the area in question in order to ensure spatial consistency of products.

Reference points used in CWAs to describe the areal location and extent of these conditions should be the same as those used in SIGMETs/AIRMETs (see NWSI 10-811, *En route Forecasts and Advisories*), or distances from those points. The Miami CWSU uses the following reference points for CWAs issued for the Bahamas Islands: ZBV (Bimini Island), ZFP (Freeport on Grand Bahama Island), ZQA (Nassau on New Providence Island), ZLA (Stella Maris on Long Island), ZIN (Matthew Town on Great Inagua Island), and GTK (Grand Turk Island).

Forecasters should use the minimum number of points needed to describe the area accurately. Points outside of the ARTCC area may be used, but only after appropriate coordination with adjoining CWSUs. Advisories broadcast to aircraft should be kept as brief and concise as possible. All references to distance in the location line of the CWA and MIS products are in nautical miles (NM). The body of the text products includes NM and not statute miles when referring to line and areal width.

As much as possible International Civil Aviation Organization (ICAO) abbreviations and codes should be used in CWSU products. If ICAO contractions conflict with 3-letter identifier, then use the FAA or General contraction. The contractions can be found at:

http://www.faa.gov/airports_airtraffic/air_traffic/publications/at_orders/media/CNT.pdf

The contraction, VC, may be used in CWSU products in conjunction with the following meteorological terms describing conditions in the area of, but not directly at, airfields or aerodromes (i.e., METAR/TAF): DS, SS, FG, FC, SH, PO, BLDU, BLSA, BLSN, and TS (i.e., VCFG, VCTS, etc.). Terms used must be consistent with NWSI 10-811, *Enroute Forecasts and Advisories*. All times must be expressed in Coordinated Universal Time (UTC or Z). The communications header format must be followed exactly if the CWSU product is to be disseminated through the FAA and other communications systems.

Scheduled briefings and products must be developed locally in agreement with the ATM or designee. These briefings should normally be produced and presented as required by the host ARTCC.

All users of CWSU advisories, statements, forecasts, and briefings should be kept aware all CWSU products are not available 24 hours a day. This can be accomplished by adding the remark "NO UPDATES AFT ddttttZ" to the end of products which will be in effect when CWSU duty hours end. The notation "dd" is the day of the month, and "tttt" is the hour and minute in UTC.

7.2 Briefings. A CWSU briefing must be discussion-based, include current and forecast weather conditions expected in the ARTCC operations area during the upcoming shift, and an outlook for the following shift or, if the CWSU is ceasing operations, the overnight hours. Each briefing should contain sufficient information for ATC and TMU managers to make decisions and appropriate operational adjustments based on weather impacts on the NAS.

A shift briefing product (alphanumeric or graphic) should contain a heading with the ARTCC designator (zzz); CWSU BRIEFING; date and time (UTC) issued; and valid date and time (UTC). For example:

ZKC CWSU BRIEFING 141805Z VALID TIL 151100Z

The following information should be included in each briefing when appropriate. Local requirements may determine the order of the items b-g:

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00119 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

a. Advisories in effect at the time of the briefing; e.g., SIGMETs, AIRMETs, airport weather warnings, CWAs, MISs, etc.;

b. Synopsis - discussion of weather systems and their movements;

c. An outlook of en route flight conditions, e.g., convective weather, turbulence, icing, volcanic ash, etc.;

d. Terminal weather, i.e., heavy snow, freezing precipitation, low IFR ceiling and/or visibility, and/or operationally significant surface winds, for designated large airports;

e. Wind direction and speed at key flight levels, including jet stream location(s);

f. Freezing level; and

g. Locally required items affecting the ARTCC area of responsibility, e.g., altimeter settings forecast or observed below 29.92 inches or above 31.00 inches.

7.3 Meteorological Impact Statement (MIS). A MIS is an unscheduled flow control and flight operations planning forecast. It is a non-technical forecast and briefing product for personnel at ARTCC, ATCSCC, TRACONS and ATCTs responsible for making flow control-type decisions. The MIS details weather conditions expected to adversely impact air traffic flow in the CWSU area of responsibility, and is valid up to 12 hours after issuance time. The MIS may be effective immediately for existing conditions when CWSU operations begin, or for rapidly deteriorating conditions, or up to two hours in advance of expected conditions. Do NOT issue a MIS if meteorological conditions warrant an advisory or warning type product. Use a CWA instead.

A MIS should not be a re-packaging of a current SIGMET, AIRMET, or CWA. A MIS should provide additional information on the current or expected weather information and be tailored to meet the unique requirements of the host ARTCC. These special requirements should be coordinated between the host ARTCC and the CWSU.

A MIS enables ATC facility personnel to include the impact of specific weather conditions in their flow control decision making. Before issuing a MIS, the CWSU meteorologist must ensure forecast conditions triggering the MIS reflect meteorological consistency with other products, such as those issued by the AWC, other national centers, and the WFOs. At a minimum, a MIS should be issued when:

a. Any of the following conditions occur, are forecast to occur, and, if previously forecast, are no longer expected:

(1) Conditions meeting convective SIGMET criteria (see NWSI 10-811)

(2) Icing - moderate or greater

(3) Turbulence - moderate or greater

(4) Heavy precipitation

(5) Freezing precipitation

(6) Conditions at or approaching Low IFR (see NWSI 10-813)

(7) Surface winds/gusts $\geq$30 knots

(8) Low Level Wind Shear (surface - 2,000 feet)

(9) Volcanic ash, dust storms, or sandstorms; and

b. In the forecaster's judgment, the conditions listed above, or any others, may adversely impact the flow of air traffic within the ARTCC area of responsibility.

MIS forecasts should use the location reference point identifiers depicted on the In-Flight Advisory Plotting Chart, and include the height, extent, and movement of the conditions. MIS product issuances should be numbered sequentially beginning at Midnight local time each day. The MIS is disseminated and stored as a "replaceable" product. Therefore, each issuance should contain the details of all pertinent known conditions meeting MIS issuance criteria, including ongoing conditions described in previously issued MISs.

The MIS should be distributed to ARTCC personnel (see Appendix D for MIS format and examples), including TMU personnel, and disseminated via FAA and NWS communications systems. If a MIS is included in, or issued concurrently with a CWSU briefing, the meteorologist should ensure the MIS portion of the briefing is disseminated to those supported facilities which do not normally receive the CWSU briefing.

Electronic graphic versions of MISs may be developed and used to provide quick reference to ARTCC users, or augment the official alphanumeric MIS products. At a minimum graphic MISs should depict all hazards or expected hazards with clearly defined boundaries. They should also show all of the associated information covered in the alphanumeric text, a valid period date/time group, and map backgrounds, as required by the local ARTCC.

If the MIS is distributed over the FAA Flight Data Entry Printout (FDEP) system, the system's message size restriction of 10 lines should be considered. Meteorologists may revise an already disseminated product for FDEP-only use.

7.4 Center Weather Advisory (CWA). The CWA is an aviation weather warning for conditions meeting or approaching national in-flight advisory (AIRMET, SIGMET or SIGMET for convection) criteria (see NWSI 10-811, *Enroute Forecasts and Advisories*). The CWA is primarily used by air crews to anticipate and avoid adverse weather conditions in the en route and terminal environments. It is not a flight planning product because of its short lead time and duration. Additionally, the CWA should be meteorologically consistent with other products and reflect conditions at the time of issuance and/or in the near future. If a CWA has been issued prior to coordination, notification to the appropriate offices, national center, or WFO should

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00121 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

follow as soon as higher priority duties permit.

CWAs are valid for up to two (2) hours and may include forecasts of conditions expected to begin within two (2) hours of issuance. If conditions are expected to persist after the advisory's valid period, a statement to that effect should be included in the last line of the text. Follow-up CWAs should be issued as appropriate. Notice of significant changes in the phenomenon described in a CWA should be provided by a new CWA issuance for that phenomenon. If the forecaster deems it necessary, CWAs may be issued hourly for convective activity. This may improve the usefulness of the Hazardous In-flight Weather Advisory Service (HIWAS) recordings which include those CWAs.

The Urgent CWA (UCWA) communications header is intended for those situations when weather conditions occur that have not been forecast and have an immediate effect on the safe flow of air traffic within the ARTCC area of responsibility. It should only be used when the CWSU meteorologist believes any delay in dissemination to FAA facilities would impact aviation safety. Use the routine CWA header for subsequent issuances of the same phenomenon. CWAs may be issued for the same phenomena described in advisories and forecast products issued by WFOs, the AWC, or the National Centers for Environmental Prediction (NCEP).

The first line of each CWA's FAA communications system header must have an ARTCC identifier immediately followed by a Phenomenon Number (1-6) (see Appendix D for CWA format and examples). The Phenomenon Number must be assigned to each meteorologically distinct condition, group of conditions, or to each set of similar condition(s) in distinctly separate areas. The first meteorological event of the local calendar day which requires the issuance of a CWA should be assigned phenomenon number 1. The latest CWA issuance with this number can replace and update the previous issuance. This numbering makes it possible to disseminate CWAs for up to six (6) unrelated events with each event issuance capable of being individually updated.

The first line must also contain an issuance/beginning valid time. When a CWA is issued with some lead time, the time entered is the issuance time. The time the meteorologist expects the conditions to begin should be stated in the text. If there is no lead time, the issuance time is considered the beginning time of the phenomena. In either case, CWAs are valid upon issuance.

On the second line, the product identifier CWA must be followed by a three-digit number. The first digit is the phenomenon number; the second two digits are an issuance number. Issuance numbers for phenomena must be issued sequentially beginning with 01. This should be followed by the VALID TIL time. The valid period (issuance time to end time) should not exceed two (2) hours. If the meteorological conditions are expected to persist after the two (2) hour period, append a remark at the end of the advisory text, and on subsequent CWAs when appropriate stating conditions might extend past valid time (e.g. CONDS EXP TO CONT AFT 20Z).

Time permitting, any CWA overlapping into another center's airspace should be coordinated and a statement should be included in the text, e.g., SEE ZOB CWA 201 FOR TS CONDS IN ZOB CTA (CTA is control area). If issuance prior to coordination is necessary, a statement regarding the area(s) affected should be included in the text, e.g., LINE TS EXTDS NW INTO ZOB CTA.

AIRMETs/SIGMETs being augmented by the CWA should be referenced in a text remark, e.g.

SEE CONVECTIVE SIGMET 8W. Each CWA should normally be disseminated via FAA and NWS communications systems.

Graphic versions of CWAs may be created to augment the disseminated text versions and provide quick reference to product users within the ARTCC. As a minimum graphic CWAs must depict all hazards detailed in the text, with hazard boundaries clearly defined, appropriate descriptive alphanumeric text, date and time group, and map backgrounds as required by the local ARTCC. Forecasters should be aware that if the CWA is to be distributed over the FAA FDEP system, that system has a product length restriction.

7.4.1 Situations Where a CWA Should be Issued.

1. When existing or anticipated weather conditions do not meet national in-flight advisory criteria (i.e., in terms of intensity or areal coverage) but current PIREPs or other weather information sources indicate those conditions, in the judgment of the CWSU meteorologist, may adversely impact the safe flow of air traffic within the ARTCC area of responsibility.

2. As a supplement to an existing in-flight advisory. The purpose of the CWA in this case is to improve upon or update the existing advisory's description of the phenomenon. These improvements may be to make the location more relevant to users within the ARTCC area or to be more precise in describing the location, movement, extent, or intensity of the phenomenon. For example, a CWA describing the specific area(s) of low IFR conditions within the ARTCC area would be a valid redefinition of the location and intensity relative to the ARTCC area and meeting documented requirements.

3. When an in-flight advisory has not been issued, but observed or expected weather conditions meet in-flight advisory criteria (based on current PIREPs and/or other sources of information) which the CWSU forecaster believes will impact the NAS within the ARTCC area of responsibility. The CWSU meteorologist should call the appropriate forecaster at the AWC, or AAWU to coordinate.

4 To cancel a CWA when the phenomenon described in the CWA is no longer expected. Use the next higher number in sequence and ensure the valid time is at least 30 minutes in length.

7.4.2 Conditions or Events Where a CWA Should be Issued. CWAs should be issued for any of the following events when they are expected to occur within two hours and have not been previously forecast by AWC or AAWU products, or to supplement the AWC and AAWU products.

a. Any of the following conditions occur, are forecast to occur, and, if previously forecast, are no longer expected:

   (1) Conditions meeting convective SIGMET criteria (see NWSI 10-811)

   (2) Icing - moderate or greater

(3) Turbulence - moderate or greater

(4) Heavy precipitation

(5) Freezing precipitation

(6) Conditions at or approaching Low IFR (see NWSI 10-813)

(7) Surface winds/gusts ≥30 knots

(8) Low Level Wind Shear (surface - 2,000 feet)

(9) Volcanic ash, dust storms, or sandstorms; and

b. In the forecaster's judgment, the conditions listed above, or any others, may adversely impact the flow of air traffic within the ARTCC area of responsibility.

7.5 **Forecast Coordination.** Forecast products issued by WFOs, AWC, AAWU, other NCEP centers, and CWSUs often address the same spatial and temporal events. CWSU meteorologists should strive to ensure forecasts, advisories, or information they provide are consistent with other forecast products, whether those products are issued locally or by other NWS offices. Coordination with responsible NWS offices prior to product issuances is important and necessary, especially when those products concern unexpected or suddenly changing observed weather conditions. This coordination prevents or minimizes confusion to end users impacting aviation safety. In the interest of preserving forecast consistency, the issuing office's decision on the forecast product is considered final.

The following is an exception:
CWSU meteorologists routinely provide TMU decision-makers with TRACON-area weather briefings. The TRACON-area briefing typically contains high-resolution details on weather conditions expected to occur within a 25 nautical mile radius of a terminal.

CWSU personnel should coordinate with personnel at the appropriate WFOs to avoid significant discrepancies between their TRACON-area weather briefings and the affected TAFs. However, since the TRACON briefing and affected TAF can involve different spatial and time resolution, differences between the two can occur.

At a minimum, the CWSU meteorologist should coordinate with the WFO aviation forecaster when the portion of the TRACON-area briefing describing terminal weather (conditions within five nm of the terminal) contradicts the affected TAF at a level requiring an amendment to the TAF (See NWSI 10-813, *Terminal Aerodrome Forecasts*). This coordination should be accomplished as soon as the CWSU forecaster becomes aware a current, or anticipated, TRACON-area weather briefing differs from the TAF and that difference requires a TAF amendment.

Such coordination should not delay the delivery of the TRACON-area weather briefing if, in the judgment of the CWSU meteorologist, a delay would cause significant impact to air traffic flow and/or compromise safety. In such a case, coordination should occur as soon as possible after the delivery of the briefing.

Occurrences when CWSU/WFO coordination fails to produce a common forecast solution should be documented on the CWSU operations log. In any case, the CWSU meteorologist is the final authority for the TRACON-area weather briefing and the WFO forecaster is the final authority for the TAF.

When there are repeated significant forecast differences between the CWSU TRACON area weather briefing and a TAF, the MICs of the CWSU and the WFO(s) should coordinate to resolve the problem.

7.5.1 Forecast Continuity with Federal Aviation Administration Order 7110.10S. When describing levels of precipitation, the following terms must be used: Light (LGT), Moderate (MOD), Heavy (HVY), and Extreme (EXTRM). These terms are applied only to intensity of precipitation; other terms may be applied in modification of icing, turbulence, or thunderstorms.

When reporting thunderstorms in a CWA or MIS, precipitation should be included at the forecaster's discretion and should use only those modifiers listed in the above paragraph. The type of precipitation associated with the thunderstorm (TS) must follow the symbol TS.

The symbol TS may be preceded by only one modifier, SEV, at the meteorologist's discretion. If a thunderstorm does not meet the criteria for SEV no modifier should be placed in front of the symbol.

Area of coverage for a thunderstorm may be included preceding the strength modifier when necessary.

7.5.2 TAF Collaboration. The TAF for the 35 Operational Evolution Partner (OEP) airports (Appendix E) is an important part in determining air traffic flow at the terminal and throughout the NAS. Consistency between the TAF and the information provided by the CWSU meteorologist is paramount in providing the FAA with weather information to aid in their decision-making process. The CWSU and WFO MICs should agree to the content, and level of detail, provided in the collaboration process; and keep documentation of that agreement in their respective offices.

For CWSUs with one or more of the 35 OEP airports in their area of responsibility, the CWSU meteorologist should collaborate on the TAF for each OEP airport(s) with the WFO meteorologist responsible for issuing the TAF as necessary. The collaboration can be conducted using any method available to the meteorologist (e.g. telephone, chat, etc.). However, using the work file described in section 7.5.3 below is a good way to create a record of collaboration.

7.5.3 Collaborative Work File. The CWSU meteorologists must provide airport-specific operations information for each of the 35 OEP airports in their area of responsibility to the WFO issuing the TAF IAW the agreement reached by the respective MICs. Other airports may be added to this requirement in coordination with the regional MSD. This information should be in the form of a work file on the AWIPS Remote Display. This work file is designed as a technical communication between qualified meteorologists, and not intended for use by non-meteorologists or the general public.

The CWSU meteorologist should provide, at least once and at least one hour prior to each scheduled TAF issuance (see NWSI 10-813, *Terminal Aerodrome Forecasts*, for TAF issuance times) during the CWSU operational hours, input into the TAF for each of their OEP airports by sending a collaborative work file to the responsible WFO. The work file should contain a brief discussion of the anticipated weather elements for inclusion in the TAF and weather impacts at the affected airport using the format below. To minimize workload issues, those CWSUs with multiple OEP airports should incorporate the information for each OEP airport into a single work file whenever possible.

CWSUs with operational hours starting at 1100 UTC or later should not provide a collaborative work file to the WFO for the 1200Z issuance unless the meteorologist has adequate time and information to provide input to the WFO. In these cases, and as time allows, the CWSU meteorologist should contact the WFO meteorologist to discuss the TAF.

Example:

```
WRKZFW
CONCERNS…WIND TREND CDFROPA. CDFRNT CRRNTLY NR A ADM-XBP-BKD LN…CONTS TO MOV
SEWRD THIS AM.  18Z STILL LUKS GOOD FOR CDFROPA AT THE DFW TERM. VFR CONDS AHD
AND BHND THE FNT WL PRVL THRU THE AFTN/EVE HRS,ONLY CLDS TO MENTION DURG THIS
PD WL BE SCT/BKN CI. AFT 06Z THUR XPECTG TO SEE BKN-OVC MVFR CIGS DVLP AS
ISNETRPC LIFT AT 295K BFNS TO SATURATE THE LWR LYRS PER NMM.

ADDITIONAL/OPTIONAL ELEMENTS

DFW AIRPORT ACCEPTANCE RATE...S FLOW 126.

DFW WX DELAYS/ACFT...NONE.

IMPORTANT NUMBERS FOR DFW (Timing of onset/ending very important)

CIGS          VSBY    ARRIVALS/HR    IMPACT
                        (AAR)
>4000          >6       120+         No ARTCC problems
1000-4000      3-6     112-114       Limited or no vis approaches (NO VAPS)
200-900       1/2-3     96           In-trail spacing needed (MIT)
<200          <1/4     78-84         Significant delays (MIT GDP)
TSRA                    0+           Variable delays (MIT GDP GS)
FZRA/FZDZ                            Major delays for de-icing (MIT GDP GS)
WINDSHIFTS                           Up to 30 minutes of ground/airborne
                                     delays to switch rwys.
CROSSWINDS
20-24KT                114-84        MIT
>25KT                  < 78          MIT GDP

Miles in Trail (MIT)      Ground Delay Program (GDP)      Ground Stop (GS)
```

7.6 <u>Support to Enroute Flight Advisory Services (EFAS) and Automated Flight Service Stations/Flight Service Stations (AFSS/FSS)</u>. The CWSU in each ARTCC is designated the primary support facility for each associated EFAS facility. CWSUs (and WFOs when CWSUs are closed) should assist the EFAS specialist to the best of their ability. Exchange of weather information can be helpful to both parties since the EFAS staff has access to additional sources of PIREP information.

Shift briefings for AFSS/FSS personnel should normally be done by the CWSU IAW FAA Order

7110.10. Weather support when the CWSU is closed or not available (unless back-up services are in effect) is the responsibility of designated WFOs IAW FAA Order 7110.10. This responsibility ensures the link with an NWS facility able to provide 24-hour support remains clear cut. Refer any requests for CWSU PWBs to an AFSS/FSS.

7.7 Operational Records. The CWSU MIC is responsible for ensuring shift logs are maintained. Information logged should include, but not be limited to, weather discussions, briefings, and equipment functionality. Each entry should record the time, the name or initials of the individual requesting information, and a brief summary of the discussion.

Logs should be retained in accordance with NOAA policies and practices as stated in NWSI 1-803, *Records Management*.

7.7.1 Handling of Weather Records. CWSU weather records and daily operations logs should be retained as directed by this instruction. Electronically displayed products generated on AWIPS or any other computerized system should not be printed solely for retention purposes. Worksheets used to update briefings or to supplement other products need not be retained. If the FAA ARTCC requires the CWSU daily operations log or its equivalent be turned over to the FAA as part of a facility record, the CWSU should make a copy of the log to meet NWS retention purposes.

7.7.2 Retention. Texts of written weather briefings and hard copy graphic records, and copies of the Daily Record of Facility Operation Log (FAA Form 7230-4) or its equivalent prepared by the CWSU should be retained for 30 days at the CWSU. After 30 days, copies of all these records should be retained for 5 years at either the CWSU or supporting WFO.

7.7.3 Protection of CWSU Records. All requests for copies of weather exhibits or written records prepared by CWSU meteorologists must be handled IAW NWSI 10-2003. In the event of an aircraft mishap or accident within the ARTCC's area of responsibility, retention procedures described above must be followed unless otherwise requested by the Manager, Forensic Services, Office of Climate, Water, and Weather Services, NWSH. In the event of a major accident, all relevant products prepared by CWSU meteorologists, including available observations, charts, and forecasts, should be collected together. If space is limited in the CWSU work area the records may be forwarded to the appropriate WFO. These records should be protected and retained in either the CWSU or the WFO for at least 30 days, allowing time to determine:

a. To what extent weather was a factor, and/or

b. What weather information is required for investigation purposes.

After 30 days, follow normal retention procedures unless the Forensic Services manager requests otherwise.

7.8 Statements. Refer to NWSI 10-2004, 10-2005, and 10-2006 for detailed instructions for handling requests for information, including forecaster statements. CWSU meteorologists do not provide written statements concerning a system incident, or an aircraft incident or accident to any government or public offices, agencies, organizations, or individuals outside of NWS without the approval of the Forensic Services manager at NWSH.

There is no requirement to allow anyone that is not part of a government investigation team to question or interview personnel in connection with an aircraft accident, whether in person or over the phone. Refer requests for interviews to the Forensic Services manager at NWSH.

7.9 **Back-Up of CWSU Operations.** On occasion, a CWSU may be closed for all or part of their duty day. Refer to Appendix B for back-up operations procedures.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00128 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix A

CWSU Support Facility Locations

CWSU		Supporting NWS WFO
ZAB	Albuquerque Center	WFO Albuquerque, NM
ZAN	Anchorage Center	AAWU
ZTL	Atlanta Center	WFO Peachtree, GA
ZBW	Boston Center	WFO Boston/Taunton, MA
ZAU	Chicago Center	WFO Chicago, IL
ZOB	Cleveland Center	WFO Cleveland, OH
ZDV	Denver Center	WFO Denver-Boulder, CO
ZFW	Fort Worth Center	WFO Fort Worth, TX
ZHU	Houston Center	WFO Houston/Galveston, TX
ZID	Indianapolis Center	WFO Indianapolis, IN
ZJX	Jacksonville Center	WFO Jacksonville, FL
ZKC	Kansas City Center	WFO Kansas City/Pleasant Hill, MO
ZLA	Los Angeles Center	WFO Los Angeles/Oxnard, CA
ZME	Memphis Center	WFO Memphis, TN
ZMA	Miami Center	WFO Miami-South Florida, FL
ZMP	Minneapolis Center	WFO Chanhassen, MN
ZNY	New York Center	WFO Upton, NY
ZOA	Oakland Center	WFO San Francisco Bay Area/Monterey, CA
ZLC	Salt Lake City Center	WFO Salt Lake City, UT
ZSE	Seattle Center	WFO Seattle, WA
ZDC	Washington Center	WFO Baltimore/Washington Sterling, VA

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00129 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix B

Back-Up of CWSU Operations

Table of Contents

1. <u>General</u>. Because there is no operational back-up support from ATCSCC to CWSUs, the following plan must be used in the event a CWSU is closed:

a. Upon request AWC will provide consultation directly to ATCSCC. AWC does not issue CWAs and cannot be expected to perform the duties of the CWSU. In Alaska, the AAWU may provide backup weather support to the Anchorage ARTCC.

b. During CWSU duty hours (normally from 5 AM to 10 PM local time), if a CWSU is non-operational (either unstaffed or for other reasons), for all or part of that time, the adjacent CWSU (or AAWU for Alaska) should provide, if able to do so, back-up CWAs and other support (if necessary) to FAA facilities such as TRACON, ATCTs, and FSS.

NOTE: If the back-up CWSU is being impacted by weather such that support to the affected CWSU's FAA-supported facilities would cause undue hardship, then support to these facilities must be on an as-requested basis. Such occurrences should be logged with the reason(s) for not providing support.

Restoration of normal service occurs when the affected CWSU is back in operation and no longer needs back-up. MISs are not included in the back-up services except as noted in the notification procedures (see example). MISs contain different criteria for each CWSU in addition to what is listed as the MIS content in Section 7.5. Therefore, it must be emphasized that the CWSU providing back-up cannot provide the same range of services that the affected CWSU provided to its ARTCC.

Information exchanges are necessary between CWSU pairs and should include support requirement information about the operational and meteorological differences between the CWSUs should back-up become necessary. Information should be shared as to the type and extent of back-up which is to be provided.

The AWC and each CWSU should be provided with a phone list of each ARTCC Watch Officer, CWSU, and AFSS by OCWWS, NWSH. For ATCSCC operations, the point of contact is the National Operations Manager (NOM): 703-708-5100.

2. <u>Notification Procedures</u>. When the CWSU determines it will be unstaffed or non-operational, the CWSU should inform its back-up CWSU, the ARTCC Area Manager, supporting WFO, NWS Region MSD, and the AWC forecaster for the region in which the CWSU resides, i.e. FA East, FA Central, FA West, or the AAWU for Alaska. If time permits, the back-up CWSU should call the ATCSCC NOM when they have assumed responsibility for the affected CWSU.

If the back-up CWSU is unavailable for support, the affected CWSU should call the AWC lead forecaster. The AWC should support the closed CWSU with its own products, except for the CWA and MIS. No support to other air traffic facilities in the closed CWSU's operational area should be given or expected in this case. NOTE: This occurrence should also be logged with a reason for the backup not being available.

The WFO/AAWU can be considered as a resource for the ARTCC in the event the CWSU is not in operation. The WFO/AAWU cannot provide all the services of a CWSU. The WFO/AAWU can answer questions about the TAF and weather affecting its local terminal as workload permits. The closing CWSU should issue a MIS specifying which CWSU has backup responsibility, any expected MIS criteria weather, the closing time, and reopening time (if known).

3. MIS Examples for Back-Up Operations:

FAUS20 KZDV 092112
ZDV MIS 01 VALID 070200-070400
...FOR ATC PLANNING PURPOSES ONLY...
ZDV CWSU WILL CLOSE 07/0200Z DUE TO SHORT STAFFING. ZAB CWSU WILL ASSUME SERVICES BACKUP. ZDV CWSU WILL REOPEN 071230Z.
CWSU/WB.

FAUS20 KZNY 121457
ZNY MIS 01 VALID 121455-130200
...FOR ATC PLANNING PURPOSES ONLY...
HI PRESS LOCATED OVER THE NORTHEAST WILL MOV EWD THRU THE PERIOD AS TWO LO PRESS SYSTEMS DVLP AND MOV INTO THE AREA. ON LO WILL DVLP IN TN/KY AND MOV INTO THE NRN OH VALLEY REGION THRU LATE TODAY AND TONIGHT. THE SECOND LO WILL DVLP OFF THE COAST OF VA AND BEG TO MOV NEWD OVERNIGHT.
.
ICING/TURB- MOD ICING IS EXPECTED IN ALL DOMESTIC ZNY FM FZLVL TO FL180...ICING WILL LAST BYD THE END OF THE PERIOD. OCNL TURB IS POSS BETWEEN FL280 AND FL370...TURB IS MORE LIKELY IN SRN ZNY.
.
TRACON AREA FORECAST- VFR COND TILL AROUND 20-22Z WHEN SNOW SHOWERS
WILL MOV INTO THE AREA. WITH THE SNOW SHOWERS CIGS WILL BEC OVC 008-012 WITH VIS 1-3SM...BY THE END OF THE PERIOD THE SNOW MAY CHANGE OVER TO SLEET/FREEZING RAIN BEFORE CHANGING TO ALL RAIN BYD THE END OF THE PERIOD. WINDS WILL BE LGT/VRB BEC 090-110 10-12KT BY 18Z.
.

ZNY OCEANIC AIRSPACE- NO SIG WX.

.

THUNDERSTORMS- NIL.

.

OUTLOOK 02-14Z...SHRA WITH IFR CONDS AND POSS ISOL LIFR. RAIN MAY BE HEAVY AT TIMES AND WILL LAST THRU THE PERIOD.

.

ZDC WILL PROVIDE SERVICE BACKUP FOR ZNY AFT 122300Z.

FAUS20 KZME 191333
ZME MIS 01 VALID 191330-191900
...FOR ATC PLANNING PURPOSES ONLY...
THRUOUT ZME:
OCNL MOD TURB 050-FL350.
OVR ZME N OF A LINE FROM PXV-MEM-VUZ:
OCNL MOD RIME ICING 030-100. CONDS ENDG BY 21Z.
ZTL CWSU HAS ASSUMED LIMITED BACKUP OF ZME OPS UFN. UPDATED MIS NA.

4. **CWSU Back-Up Pairings:**

ZAB	Albuquerque, NM	ZDV
ZAN	Anchorage, AK	AAWU
ZTL	Atlanta, GA	ZME
ZBW	Nashua, NH	ZOB
ZAU	Aurora, IL	ZID
ZDV	Longmont, CO	ZAB
ZFW	Fort Worth, TX	ZHU
ZHU	Houston, TX	ZFW
ZOB	Oberlin, OH	ZBW
ZID	Indianapolis, IN	ZAU
ZJX	Jacksonville, FL	ZMA
ZKC	Olathe, KS	ZMP
ZLA	Palmdale, CA	ZOA
ZME	Memphis, TN	ZTL
ZMA	Miami, FL	ZJX
ZMP	Minneapolis, MN	ZKC
ZNY	Ronkonkoma, NY	ZDC
ZOA	Fremont, CA	ZLA
ZLC	Salt Lake City, UT	ZSE
ZSE	Auburn, WA	ZLC
ZDC	Leesburg, VA	ZNY

This chart is reversible, e.g. ZME backs up ZTL and vice versa, except for ZAN and the AAWU.

Appendix C

MIS Format and Examples

1. **MIS Format**. The FAA header line is zzz MIS ii VALID ddtttt-ddtttt; where "zzz" is the ARTCC identification, (e.g., ZJX), "MIS" is the product type, "ii" is the 2-digit sequential issuance number, and "ddtttt" is the valid beginning and ending date/time UTC. The second sentence of the MIS must be "FOR ATC PLANNING PURPOSES ONLY".

Any remarks such as "SEE CONVECTIVE SIGMET 8W"; "NO UPDATES AVBL AFT 0230Z"; and Forecaster initials and/or facility identifier may be placed at the end of the MIS.

If the phenomenon described in a MIS is no longer expected, a cancellation MIS message must be issued. The FAA header does not contain an issuance number. However, the MIS text begins with "Cancel zzz MIS ii." A text explanation for the cancellation should follow. If the phenomenon described in the MIS is expected to continue beyond the operating hours of the CWSU, then the remark "NO UPDATES AFT ttttZ" (where "ttttZ" is the UTC closing time of the CWSU) should be added at the text end. The MIS is non-technical in nature to convey expected weather and impacts in the clearest, and simplest, manner possible to the FAA user.

2. **MIS Examples:** These examples are actual products issued by CWSUs and archived at the National Climate Data Center (NCDC).

Preferred Formats:
FAUS20 KZOB 010158
ZOB MIS 03 VALID 010200-011300
...FOR ATC PLANNING PURPOSES ONLY...
HI PRESSURE BRINGS VFR CONDS. A W-E ORIENTED JET ACROSS ZOB WITH
WINDS UP TO 175KT AT FL300-390.
CONF LVL: HIGH
HAZARDS WITHIN ZOB AIRSPACE THRU 12HRS...
1. TS...NONE
2. ICING...NONE
3. TURB...NONE
4. STG LOW LEVEL WINDS...LLWS AND
SGFNT HUB AIRPORT CROSSWINDS...NONE
5. IFR COND...NONE
ZOB AIRSPACE OUTLOOK 12-24HRS... INCREASING HI CLOUDS AHEAD OF NEXT
SYSTEM BUT STILL NO SIG HAZARDS.
NO UPDTS AFT 0230Z.

FAUS20 KZOB 011736
ZOB MIS 02 VALID 011736-020230
...FOR ATC PLANNING PURPOSES ONLY...
LOW PRESSURE NEAR BUFFALO WILL TRACK EAST OF ZOB TODAY WHILE AN
UPPER LEVEL TROF WAS STILL TO THE W. SYSTEM SNOW WILL GRADU GIVE
WAY
TO A LESS

GENERAL LAKE EFFECT SNOW SCENARIO THRU TOMORROW.
A STRONG UPPER LEVEL JET OF ABOUT 150KT WAS ASSOCIATED WITH TURBULENCE IN ZOB. THIS JET WILL SHIFT SE OF ZOB...ALLOWING FOR A DECREASING TREND IN TURBULENCE.
HAZARDS IN ZOB THRU 02/0600Z...
1. TS...NONE.
2. ICING...AREAS LGT-MOD RIME/MX BLW 120 THROUGHOUT.
3. TURBULENCE...E OF A LINE FROM 55NNE FWA TO 25SE ECK...AREAS LGT-MOD TURB/CHOP SURFACE TO FL350. COND SLOWLY DIMINISHING FROM NW-SE AS UPPER JET SHIFTS SE OF ZOB/LOW LEVEL WINDS DIMINISH.
4. STRONG LOW LEVEL WINDS, LLWS, CROSSWINDS AT THE HUB AIRPORTS... UNFAVORABLE SURFACE WINDS AT DTW OF 30015G22KT WILL GRADU DIMINISH TODAY.
5. IFR...MAINLY NE OF A LINE FROM 25SE ECK TO 55SSW CLE TO PSB...PATCHY IFR TO LIFR IN SHSN/BLSN.

THE OUTLOOK IN ZOB FROM 02/0600Z THRU 02/1800Z...
GENERAL SNOWFALL ASSOCIATED WITH AN UPPER TROF BEGINS TO DIMINISH WHILE LAKE EFFECT SNOW SHOWERS
INCREASE. ICING/FLIGHT LEVEL TURB DECREASES.
UNFAVORABLE GUSTY NW SURFACE WINDS CONTINUE AT DTW.

FAUS20 KZBW 011714
ZBW MIS 02 VALID 011700-020000
...FOR ATC PLANNING PURPOSES ONLY...
.
IMPACTS: 011700-020500Z
OCNL MOD ICG FRZLVL-170 THRUT BY 012100Z. FRZLVL SFC NRN ZBW AREA RISING TO 030 SRN AREA. OCNL MOD TURB BLW 150 THRUT BY 012100Z. OCNL MOD CAT 150-FL350 THRUT BY 012100Z. SFC WND GSTG ABV 30KT S OF BOS TO 25NE JFK LN BY 012200Z. PTCHY CIG BLW 5 HND FT AND/OR VIS BLW 1SM IN -SN BR THRUT BY 020300Z. NO UPDATES AFT 020200Z.
.
THUNDERSTORMS: NONE
.
SHORT TERM: 011700-020500Z
LO PRES AREA OVR ERN LK ERIE WITH OCFNT SEWD TO DELMARVA PEN THIS MRNG. MVFR/IFR CIG -SN NY AND NEW ENG EXCP VFR ME. SFC WND VARIOUS DRCTNS 5-10KT. LO WL MOV NEWD TO NS TNGT ACCORDING TO NAM AND GFS. CONTD MVFR/IFR CIG -SN BR NY AND NRN NEW ENG. BCMG VFR

SERN NY AND SRN NEW ENG. SFC WND N-NE 5-10KT NRN NEW ENG AND W-NW 10-20 GSTG 20-30KT REST ZBW AREA. OCNL MOD ICG, OCNL MOD LO LVL TURB WITH LLWS AND OCNL MOD CAT THRUT.

.

OUTLOOK: 020500-021700Z
LO PRES MOVS NEWD INTO NFLD AND HI PRES AREA MOVS INTO CNTRL PLAINS WED MRNG ACCORDING TO NAM AND GFS. CONTD MVFR/IFR CIG -SN BR NY AND NRN NEW ENG. CONTD VFR SERN NY AND SRN NEW ENG. SFC WND W-N 10-20KT GSTG 20-30KT. FQT MOD ISOLD SVR LO LVL TURB WITH LLWS THRUT. CONTD OCNL MOD ICG NY AND NRN NEW ENG. NO CAT EXPCD.

FAAK20 KZAN 010344
ZAN MIS 02 VALID 010345-011545
...FOR ATC PLANNING PURPOSES ONLY...
A LAYER OF VERY COLD AIR ALOFT COVERS THE ALASKA PANHANDLE AND PART
OF THE EASTERN MAINLAND ALONG WITH THE ADJACENT NORTH AND EASTERN GULF OF ALASKA.
BALLOON SOUNDINGS ALONG WITH SATELLITE...MODEL AND ACARS DATA INDICATE TEMPERATURES OF -65C AND COLDER BETWEEN FL340 TO FL420. AT THESE TEMPERATURES FUEL CAN CONGEAL.
THE AREA OF CONCERN IN ALASKAN AIRSPACE IS THE AREA EAST AND SOUTH OF A LINE FROM:
67 NORTH LATITUDE SOUTHWARD ALONG 146 WEST LONGTITUDE
TO JOH...AND FROM JOH TO 120 SW OF ANN
THIS LAYER WILL MOVE NORTHEAST ACROSS MOST IF NOT ALL THE PANHANDLE
DURING THE NIGHT LEAVING AN AREA OF VERY COLD AIR OVER PARTS OF THE WRANGEL MTNS AND COPPER VALLEY AT 01/1545Z.
A FURTHER STATEMENT CAN BE EXPECTED.
GJD JAN 08

FAUS20 KZDC 011746
ZDC MIS 02 VALID 011800-020600
...FOR ATC PLANNING PURPOSES ONLY...
STRONG COLDFNT MOV E ACROSS ZDC. MVFR/IFR CIG/SN MTNS WV
...MOD-SEV RIME/MX ICE INC/PRECIPITATION BLW 120.
ELSEWHR ZDC...VFR INCLUDING IAD DCA BWI RDU ORF.
...
SFC WINDS BECMG W-WNW 15-30 KT VA N INCLUDING IAD DCA BWI AND 15-25 KT INCLUDING RDU ORF. ISOL GUSTS 35 KT VA N.
...
MOD-SEV TURB BLW 100 ACROSS ZDC DUE STG WINDS.
STRONG UP-AND-DOWN-DRAFTS OVER/E OF MTNS.
MOD ISOL SEV TURB 150-FL360 ESPECIALLY VA N DUE JTST WS.
...

OUTLOOK 02/0600Z-02/1800Z...UPR LVL LO PRES OVER OH/TN VLYS
MOV ESE. IFR CIG/SN MTNS WV. MVFR/VFR CIG/SHSN ELSEWHR INCLUDG
VCNTY DCA IAD BWI RDU. NW WINDS 15-30 KT. MOD-SEV ICE/TURB.

Alternative Formats:
FAUS20 KZMA 010132
ZMA MIS 01 VALID 010130-011330
...FOR ATC PLANNING PURPOSES ONLY...
OVR ZMA AIRSPACE, OVR CNTL FL, NORTH OF A LINE FM 10S PBI TO 20S FMY
AREA OF MVFR CONDS WITH PATCHY IFR CONDS. A SFC LOW PRESS TROF FM A
REMNANT FRONTAL BNDRY MOVD S DURING FRI AND BROUGHT WITH IT LOW
CIG AND LOW VIS. XPC CONDS TO CONT THRU 1330Z.
MR

FAUS20 KZMP 010154
ZMP MIS 03 VALID 010150-011300
...FOR ATC PLANNING PURPOSES ONLY...
ZMP AREAS SW OF A LN FM DIK - 55S DSM..
LGT-MOD TURB BLW 100...LGT-MOD ICING BLW 140...DVLPG SPRDG OVR FM SW
06-9Z AND CONTG TO SPRD NE OVR N IA & S MN THRU 12Z. AREAS OF
IFR-LIFR CONDS DVLPG SAME AREA FM THE SW AHD OF A DEEP LOW PRESS SYS
MOVG OUT OF NE CO SAT MORNG.
...UPDTS UNAVBL 01/0230Z-01/1100Z...

FAUS20 KZID 010159
ZID MIS 03 VALID 010200-011200
...FOR ATC PLANNING PURPOSES ONLY..
ACROSS ZID
FRQ LGT OCNL MOD TURB FL320-390. OCNL LGT CHOP FL400-430..
BECMG OCNL MOD AFT 06Z. CONDS IN JTST WS.. CONTG BYD 12Z.
IN ZID N OF A LINE FROM 45SE DEC TO 20NW EKN
ISOL MOD RIME ICE IN CLDS DVLPG FM WEST AFT 06Z.. SPRDG OVER
NRN ZID BY 12Z.
LAST.. NO UPDTS
ZID CWSU.=

FAUS20 KZDC 010227
ZDC MIS 03 VALID 010215-011400
...FOR ATC PLANNING PURPOSES ONLY...
COLDFNT OH VALLEY MOV E INTO ZDC. VFR.
SFC WIND BECMG S-SW 5-10 KT INCLUDG DCA IAD BWI
AND S 5 KT OR LESS NC AND SERN VA INCLUDG RDU ORF.
...
OCNL MOD TURB MAINLY BLW 080 AND FL260-400 VA N.
...
OUTLOOK 01/1400Z-02/0200Z...COLDFNT MOV E ACROSS ZDC.
WINDS BECMG NW 10-25 KT. MOD TURB BLW 100 AND FL250-400.

VFR CIGS/RA/IP SPREADING E INTO ERN WV ABT 00Z.

...

NO UPDTS AFT 01/0230Z.

Appendix D

CWA Format and Examples

1. CWA Format:

a. Line one of FAA header:

zzzp (U) CWA ddtttt (Note: () = optional)

b. Line two of FAA header:

zzz CWA pii VALID TIL ddtttt, where header elements are:

zzz	ARTCC Identification, e.g., ZKC
p	Phenomenon Number (single digit, 1-6)
(U)CWA	Product Type (note: UCWA is only used on line one of the header)
ddtttt	Beginning and/or issuance UTC date/time
ii	Issuance Number (issued sequentially for each Phenomenon Number, can go as high as 99 if needed)
ddtttt	Ending valid UTC date/time

c. Line one of text - Phenomenon Location

FROM aaa TO bbb TO ccc TO aaa	Polygons
FROM aaa TO bbb	Lines
VC or VCY aaa	Vicinity
aaa	Point
nnnDDD aaa	Point

Notes:

(1) The location line should not exceed one line of text and must end **without** a period.

(2) aaa, bbb, etc. are location identifiers depicted on the in-flight advisory plotting chart. These identifiers should be used as area or line-defining points, or as all or part of a point reference (i.e., VC or VCY (n)nn DD(D) XXX). The (n)nn is distance in nautical miles and DD(D) is a 16-point compass direction (e.g., VC IAH or 40NNE LBB). NOTE: While VC or VCY are valid methods to depict location, the use of a direction and distance (i.e., 40NNE LBB) is preferred.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00139 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

(3) Polygon areas are defined with the keyword FROM and followed by three or more points starting in the northernmost corner of the areas, proceeding clockwise, and ending by repeating the first point.

(4) The text for a line phenomenon must contain the keywords LINE and nn NM WIDE where nn is the width of the line in nautical miles. Describe a line from north to south and west to east using as many points as necessary to indicate any changes in line orientation.

(5) The text for a phenomenon defined around a point must contain the keywords AREA or ISOL. The diameter of a point phenomenon, i.e., DIAM nn NM must also be specified.

(6) If some or all of a CWA phenomenon is outside of the points depicted on the in-flight advisory plotting chart, then describe the location by using latitude, longitude, or plain language geographic location.

Line two of text - phenomenon description: Text description should include key phrases detailed in the notes above. Remarks, if appropriate, should be added to the end of the text. NOTE: The forecaster may choose to include initials, facility identifier, or the forecaster number at the end of the CWA.

2. <u>CWA Examples</u>: These examples are actual products issued by CWSUs and archived at NCDC.

FAUS21 KZMA 010157
ZMA1 CWA 010155
ZMA CWA 102 VALID UNTIL 010355
FROM 75SW SRQ TO 180WSW FMY
BKN LINE...20 NM WIDE...OF SHRA AND ISOL TS MOV FROM 25020KT. MAX
TOPS EST NR FL320. XPC LTL CHG IN TS CVRG/INTST THRU 0355Z.
MR

FAUS21 KZOA 010227
ZOA1 CWA 010225
ZOA CWA 101 VALID UNTIL 010425
FROM 8NNW OAK-25SSE OAK
LINE 20NM WIDE MOD-SEV TURB BLW 060 WITH LLWS CONDS. DUE TO STRONG
NE WINDS OV RUFF TRRN. REPTD BY SMALL ACFT. ZOA CWSU.

FAUS24 KZJX 130208
ZJX4 CWA 130210
ZJX CWA 401 VALID UNTIL 130410
50SE FLO
DIAM...15NM WIDE OF CIGS BLW 005 AND/OR VSBY AOB 1SM
IN BR/FG.CONDS EXPD TO CONT AND SPRD S AND W OF THE AREA

DRG THE NXT 2 HRS. NO UPDATES AFT 0230Z.
VC

FAUS21 KZJX 130214
ZJX1 CWA 130215
ZJX CWA 103 VALID UNTIL 130415
FROM 25SW SAV TO CRG TO 40E CTY
LN...15NM WIDE OF CIGS BLW 005 AND/OR VSBY BLW 1SM IN
BR/FG. CONDS EXPD TO INCR IN COVERAGE OVR GA/FL BYD THE
NXT 2 HRS. NO UPDATES AFT 0230Z.
VC

FAUS21 KZFW 131144
ZFW1 CWA 131145
ZFW CWA 101 VALID UNTIL 131330
FROM 25SE TXK TO 35SE EIC TO 55ENE LFK
TO 40NW LFK TO GGG TO 25SE TXK
AREA OCNL LIFR CONDS.
CIGS BLW 005/VIS BLW 1SM BR/FG.
CONDS ENDG MOST AREAS BY 1330Z.
XZ

FAUS22 KZJX 131152
ZJX2 CWA 131155
ZJX CWA 201 VALID UNTIL 131355
FROM 220SW TLH TO 200S CEW TO 135SSE CEW TO 220SW TLH
AREA...SCT SHRA/ISOLD EMBDD TS MOVG FM 24020KTS.
MAX TS TOPS EST NR FL350. EXP SLO INCRS IN CVRG/INTST THRU PD.
JW

FAUS21 KZME 291421
ZME1 CWA 291420
ZME CWA 101 VALID UNTIL 291600
FROM 20W BWG TO 25W BNA TO 50SE DYR TO 25W ARG TO 20W BWG
AREA OF SHRA WITH ISOLD CLUSTERS OF TS. TOPS MOSTLY TO FL300 WITH
ISOLD TOPS TO FL340. STORM MOTION IS FM 24040KT.

FAUS21 KZAU 291600
ZAU1 CWA 291600
ZAU CWA 101 VALID UNTIL 291700
28N IND
ISOL TSRA..DIAMETER 15NM
MOV FROM 22050KT..TOP TO FL250.
=

FAUS21 KZLC 312010
ZLC1 CWA 312010
ZLC CWA 101 VALID UNTIL 312210

FROM LWT TO SHR
WIDTH 40NM WEST TO 100NM EAST OF LINE. MOD-SEV MTN WAVE FL340-FL380.
+/- 15-20KT AND +/- 500FT. RPTD BY MULT ACFT. CONDS EXP TO CONT
AFTER 2007.

FAUS21 KZOA 312134
ZOA1 CWA 312130
ZOA CWA 101 VALID UNTIL 312330
FROM 90N FMG-90SSE FMG-50NNW CZQ-35NNE RBL-90N FMG
AREA MOD-SEV RIME ICE BTN FL100 AND FL220.
RPRTD BY AIRCRAFT. ZOA CWSU.

FAUS22 KZFW 312321
ZFW2 CWA 312321
ZFW CWA 201 VALID UNTIL 312345
CANCELLED. LIFR CIGS HAVE IMPROVED.
XZ=

FAUS21 KZDC 101921
ZDC1 CWA 101925
ZDC CWA 102 VALID UNTIL 101955
CANCEL ZDC1 CWA 101. SEE CONVECTIVE SIGMET 73E. RPG.
....
.
=
FAUS21 KZME 162041
ZME1 CWA 162040
ZME CWA 101 VALID UNTIL 162240
FROM 40W HEC TO HEC TO 35W MZB TO 50SSW LAX TO 40W HEC
AREA SCT RASH AND FEW TSRA CB TOPS 370 MOVG FM 150 15KTS. MOST
SIG ATC IMPACT IS VCY DAG HEC CORRIDOR AND PMD. CONDS CONTG BYOD
2248Z. WX=

FAUS22 KZHU 080201
ZHU2 CWA 080200
ZHU CWA 201 VALID UNTIL 080300
15S IAH
ISOL TS. DIAM 25NM. MOV FM 14015KT.
TOPS TO FL400.
SJ=

FAUS22 KZMP 202210
ZMP2 UCWA 202210
ZMP CWA 201 VALID UNTIL 202300
FROM 25NE OBH TO 75NW OVR
RAPIDLY DVLPG AREA SEV TSRA 20NM WIDE MOV FM 30030KT. TOPS ABV
FL450. TORNADOES..HAIL TO 2 INCHES...WIND GUSTS TO 60KT PSBL.

...CONVECTIVE SIGMET EXPECTED SHORTLY...=

FAUS21 KZID 221505
ZID1 CWA 221500
ZID CWA 101 VALID UNTIL 221700
FROM ROD TO 60E APE TO HNN TO 45SE DEC TO DEC TO ROD
FRQ MOD OCNL SEV TURB FL300-330 IN STRONG JTST WS.
ACFT RPT WINDS @FL350 250135KT.. @FL310 250050KT.=

APPENDIX E

OEP Airports and Associated CWSU

Airport	CWSU
Phoenix Sky Harbor International -- PHX	Albuquerque
Atlanta/Hartsfield-Jackson Atlanta International -- ATL	Atlanta
Charlotte/Douglas International -- CLT	Atlanta
Chicago Midway -- MDW	Chicago
Chicago O'Hare International -- ORD	Chicago
Cleveland-Hopkins International -- CLE	Cleveland
Detroit Metropolitan Wayne County -- DTW	Cleveland
Pittsburgh International -- PIT	Cleveland
Denver International -- DEN	Denver
Dallas-Fort Worth International -- DFW	Ft Worth
George Bush Intercontinental/Houston -- IAH	Houston
Cincinnati-Northern Kentucky International-- CVG	Indianapolis
Orlando International -- MCO	Jacksonville
Lambert St. Louis International -- STL	Kansas City
Las Vegas McCarran International -- LAS	Los Angeles
Baltimore-Washington International Thurgood Marshall-- BWI	Leesburg
Ronald Reagan National -- DCA	Leesburg
Washington Dulles International -- IAD	Leesburg
Los Angeles International -- LAX	Los Angeles
San Diego International Lindbergh -- SAN	Los Angeles
Memphis International -- MEM	Memphis
Fort Lauderdale-Hollywood International -- FLL	Miami
Miami International -- MIA	Miami
Tampa International -- TPA	Miami
Minneapolis-St Paul International -- MSP	Minneapolis
Boston/General Edward Lawrence Logan International -- BOS	Nashua
New York John F. Kennedy International -- JFK	New York
New York LaGuardia -- LGA	New York
Newark International -- EWR	New York
Philadelphia International -- PHL	New York
San Francisco International -- SFO	Oakland
Salt Lake City International -- SLC	Salt Lake City
Portland International -- PDX	Seattle
Seattle -Tacoma International -- SEA	Seattle
Honolulu International -- HNL	

Map of the 35 OEP Airports and the FAA Regions (courtesy of the FAA)

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00145 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

#4

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-814

November 10, 2008

Administration and Management

Aviation Weather Services, NWSPD 10-8

CENTER WEATHER SERVICE UNIT SITE REVIEW PROGRAM

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/OS23 (C. Abelman) **Certified by:** W/OS23 (K. Johnston)

Type of Issuance: Initial

SUMMARY OF REVISIONS: This is the initial issuance of NWSI 10-814.

//Signed// October 27, 2008
David B. Caldwell Date
Director, Office of Climate, Water, and Weather Services

Table of Contents **Page**

1. Purpose. This directive provides general procedures for National Weather Service (NWS) Center Weather Service Unit (CWSU) quality assurance of services and products provided to the Federal Aviation Administration (FAA). CWSU support to the FAA is detailed in NWSI 10-803.

2. General. NWS CWSU support is designed to improve aviation safety and enhance efficient flow of air traffic by forecasting and monitoring adverse weather. Efficiency is promoted by maintaining close coordination with traffic managers whose decisions affect the flow of air traffic through the National Airspace System (NAS). Quality assurance of CWSU services and products will result in improved services to the FAA.

The CWSU Site Review program will annually document CWSU service and product strengths and weaknesses for each CWSU. Input will be gathered by on-site observations and by interviews of both the CWSU meteorologists and appropriate FAA representatives. To provide a comprehensive review, verification statistics for each CWSU product will be appended to the final report.

The CWSU Site Review Program will not provide an overall pass/fail indicator for the CWSU. Individual elements of the CWSU services and products may receive pass/fail indicators.

3. Background. The CWSU Site Review Program was developed in response to the Government Accountability Office's (GAO) finding regarding verification of CWSU products and services. Historically, verification of CWSU products and services has been accomplished annually using subjective, free-form evaluations from the FAA's Traffic Management Unit (TMU) Controllers.

4. Initiation of the CWSU Site Review. The CWSU Site Review Program will be implemented in phases.

The first phase will consist of an introductory site review. This introductory site review is conducted in the same manner as an official site review with the appropriate documentation for each CWSU but is a "baseline" review. This "baseline" review provides the CWSUs with some insight on the review process and program expectations. No element of the first review will receive a failing score. Those elements identified as underperforming are noted and tracked; and the appropriate improvements are executed prior to the second phase.

The second phase commences with an official CWSU Site Review. This review will be the official review of the office. Any failing elements require an Element Improvement Plan.

5. CWSU Site Review Team. The function of the CWSU Site Review Team is to assess individual CWSU services and products and to report results to the NWS and FAA management.

The CWSU Site Review Team consists of three participants. Due to the schedule and available space in a CWSU, the CWSU Site Review Team is limited in participant number.

The CWSU Site Review Team will report to NWS and FAA management on the CWSU performance.

5.1 Reviewers. The CWSU Site Review Team members are the Director of the NWS Office of Climate, Water, and Weather Services (OCWWS) or designated Regional Director, a member of the OCWWS Aviation Weather Services Branch (ASB), and a Regional Aviation Meteorologist (RAM). The RAM participating on the review team should not be from the region the CWSU is located.

5.1.1 Reviewer Training. Training for the CWSU Site Review Team Reviewers will be developed and conducted prior to the conducting site reviews. The training should include information on how to conduct a CWSU Site Review and how to effectively conduct interviews.

5.2 Other Participants. In addition to the Reviewers, both the MIC of the "parent" WFO, the MIC of the Alaska Aviation Weather Unit (AAWU), when appropriate, and the MIC of the CWSU accompanies the Site Review Team to provide information to the Reviewers but they do not participate as Reviewers.

6. Notification of Site Review. At the beginning of each fiscal year, the schedule of site reviews is determined and published. The published schedule is provided to the FAA including the CWSU Interagency Agreement Contracting Officer Technical Representative (COTR), the Air Route Traffic Control Center (ARTCC) Facility Managers, the Traffic Management Unit (TMU) Supervisory, and the regional FAA Quality Assurance Program Managers. The schedule is also provided to the NWS OCWWS Director, the OCWWS Aviation Services Branch Chief, the Regional Directors, the Regional Service Division Chiefs, the AAWU, the RAMs, and the WFO and CWSU MICs.

One month prior to the scheduled Site Review, ASB sends a notification to all representatives associated with the scheduled CWSU with a tentative agenda and schedules interviews with appropriate FAA representatives.

7. **Conduct of the Site Review.** The CWSU Site Review is conducted over 2 days. Upon arrival to the facility, the Site Review Team should meet with the Traffic Management Officer (TMO) and appropriate members of the ARTCC staff. The initial meeting should include a briefing by the CWSU Review Team explaining the visit procedure and review plan.

Participation from the ARTCC TMU and Sector Managers/Supervisors is necessary to get an accurate evaluation of the services provided by the CWSU.

7.1 **Observations.** The Site Review Team should spend time on both the morning and afternoon shifts observing the CWSU meteorologist functions for two days. This observation will include interactions with the CWSU customers including scheduled briefings, on-demand briefings, and the issuance of any CWSU product. A minimum of two stand-up briefings will be observed.

Evaluation of the elements will be made on the CWSU Site Review Checklist (Appendix B).

7.2 **Interviews.** The Site Review Team should schedule, in advance, interviews with appropriate FAA representatives. The interviews should follow the CWSU Site Review Checklist (Appendix B) and responses should be noted on the checklist.

7.2.1 **FAA Input.** The FAA will be asked to provide examples of how the CWSU meteorologist assists, or does not assist, the FAA in improving safety and efficiency of the NAS. Specific examples will be encouraged.

7.3 **Exit Briefing.** Upon completion of the on-site portion of the CWSU Site Review, the Site Review Team should provide the Traffic Management Officer and appropriate members of the ARTCC staff with an exit briefing. The briefing should include a discussion of preliminary findings and the CWSU product verification, if available.

7.3 **Final Report.** The Site Review Team will provide a written report of the review to the following within two weeks of the end of the review:

- FAA CWSU COTR
- ARTCC Air Traffic Manager
- TMU Supervisor
- FAA Regional Quality Assurance Manager
- NWS OCWWS Director
- NWS Regional Director

- NWS Regional Service Division Chief
- NWS Regional Aviation Meteorologist
- WFO/AAWU MIC
- CWSU MIC

7.4 Results Briefing. The Site Review Team will conduct a briefing on the findings of each Site Review. The briefing should include the findings of the Site Review and a discussion of the CWSU product verification. The briefing should be for the following:

- NWS Deputy Assistant Administrator
- NWS OCWWS Director
- NWS Regional Director
- FAA CWSU COTR
- NWS Regional Service Division Chief
- WFO/AAWU MIC
- CWSU MIC

8.0 Evaluations Resulting in Failures. Any element resulting in a "no" on the CWSU Site Review Checklist (Appendix B) is considered failing and the element is then considered failing.

9.0 Mitigation of Failing Element(s). If any element(s) of the CWSU Site Review is deemed failing, the WFO and CWSU MIC will provide a written Element Improvement Plan to the NWS Director of OCWWS within two weeks of receipt of the final report. The Element Improvement Plan should include planned actions to improve the failing element(s) with a timeline.

ASB, the NWS Region, the WFO and CWSU will work together to successfully mitigate any failing elements within 90 days of the review.

Appendix A
CWSU Site Review Checklist Reviewer's Guidance and Expected Performance

The following is guidance on the CWSU Site Review Checklist (Appendix B) for the Site Review Team.

The Review assesses services provided by the CWSU to the FAA both locally and remotely and is accomplished by observation and by interviews.

The Reviewers assess each of the five elements. The CWSUs will not receive a cumulative "grade" for the review. Each element is reviewed to ensure the CWSU is providing adequate service. In addition, the Reviewers should note the CWSU's best practices which may be shared with other offices to improve services. Areas for improvement should also be noted. These can be elements which receive a "Pass," but could be improved for enhanced services.

Elements which receive "Fail" must have specific reasons for the failing assessment in the "Add additional comments…" section of the Checklist.

The MIC of the parent WFO, or the AAWU when appropriate, and the MIC of the CWSU must sign the Review Checklist after the completion of the Review briefing to the TMO.

Each element is divided into sub-elements. Any sub-element which receives a "no" during the review will result in a "Fail" of the element.

Element 1 Briefings – Stand-up ARTCC
CWSU meteorologists provide scheduled, stand-up briefings to ARTCC personnel on current weather and weather forecasted to impact their area.

This element is designed to determine the effectiveness of the CWSU's Stand-up briefings. The intent is to ensure pertinent weather is clearly translated to the ARTCC. The Reviewers will observe a minimum of two stand-up briefings from different CWSU meteorologists if possible.

1.1 Record the number of stand-up briefings observed.

1.2 Were the briefings clear and concise?

- Review the delivery of the information to ensure both the information and delivery is clear and concise. The Reviewers should also observe the briefing attendees noting their reactions and questions to the CWSU meteorologist. If the meteorologist does not adequately conduct the briefings based on the following three criteria, the Reviewer should mark this sub-element as "no." The Reviewers should keep in mind the following questions while attending the briefings.
    - Did the meteorologist use proper pace and tone for the audience?

- As with any public speaking, the speaker's pace and volume have an impact on the delivery of the weather information. The speaker should keep a deliberate pace which is not too fast or too slow. In addition, all attendees should be able to hear the speaker.

- Did the meteorologist use appropriate, non-technical language for the audience?

  - The speaker should be well aware of the weather knowledge of the members of the audience and provide information to the level of detail necessary for the understanding of the audience.

- Did the meteorologist provide information on pertinent weather affecting the ARTCC and beyond?

  - The speaker should focus the discussion on weather impacting the ARTCC. This can be within their area of responsibility or beyond, depending on the weather situation and the potential it has for affecting their ARTCC's area. The speaker should limit discussion of weather outside of their area of responsibility if it will not impact ARTCC operations.

1.3 Did the briefing provide consistent information?

- Review the content of the briefing to ensure consistent information is provided. The briefing contents should not contradict other forecasts without sound meteorological reasoning. Reviewers should keep in mind the following questions during the briefings. If the meteorologist deviates from other forecasts for the ARTCC area without sound meteorological reasoning, the Reviewer should mark this sub-element as "no."

  - Did the meteorologist deviate from other aviation forecasts valid for the ARTCC area?

  - If so, was the deviation justified?

1.4 Did the meteorologist clarify inconsistent information?

- Review the contents of the briefing to ensure the CWSU meteorologist clarified inconsistent forecasts affecting the ARTCC's area. With the numerous products issued for each ARTCC area, the CWSU meteorologist should clarify any inconsistencies in the forecasts and provide a single, clear forecast to the ARTCC to assist with operations. If the meteorologist does not sufficiently clarify inconsistencies in the forecast products, the Reviewer should mark this sub-element as "no."

1.5 Did the meteorologist use sound meteorological reasoning?

- Review the contents of the briefing to ensure the meteorologist uses sound meteorological reasoning throughout the briefing. The information contained in the briefing should be based on sound meteorological reasoning. If the information is not, the Reviewer should mark this sub-element as "no."

1.6 Did the meteorologist provide a depiction of weather conditions which are affecting or have the potential to affect air traffic services or aircraft operations with the ARTCC area?

- Review the contents of the briefing to ensure the meteorologist has addressed weather conditions potentially impacting the ARTCC's area. The FAA has determined the following list to be important to operations and any of these items impacting the area should be addressed in the briefing although other items may be included depending on the ARTCC's climate.
    - Thunderstorm location and intensity
    - Area of precipitation
    - Cloud coverage
    - Icing levels
    - Turbulence
    - Winds aloft
    - Low-level wind shear
    - Areas of less than 3 miles visibility and/or ceilings less than 3,000 feet
    - Significant pressure changes

1.7 Add additional comments...

- The Reviewer should note any actions taken by the CWSU meteorologist to eliminate inconsistencies in the forecasts for their area.

- The Reviewer should also note any best practices which could be used at other CWSUs.

- The Reviewer will provide specific information on a sub-element receiving a "no" check resulting in a "Fail" of the element.

Element 2 – On-demand Briefings

CWSU meteorologists are frequently asked to provide weather briefings by individuals either at the ARTCC or other remote FAA facilities. These briefings require a comprehensive knowledge of the current and forecast weather and the CWSU meteorologist's ability to quickly assimilate weather information and translate it to the requestor.

This element is to determine the effectiveness of the CWSU's on-demand briefings. The intent is to ensure the weather is clearly and adequately translated to the requester and that the initial question is correctly answered.

2.1 Record the number of on-demand briefings observed.

2.2 Record the facility(s) briefed.

2.3 Was the inquiry adequately answered?

- Review the content of the briefing to ensure the inquiry is adequately answered. If the meteorologist did not adequately answer the inquiry, the Reviewer should mark this sub-element "no." An adequately answered inquiry should include a clear and concise answer to the question and any additional information which may be pertinent to the requestor for making decisions.

2.4 Were the briefings clear and concise?

- Review the delivery of the information to ensure the information and delivery is clear and concise. If the meteorologist does not adequately conduct the briefing based on the following three questions, the Reviewer should mark this sub-element as "no." The Reviewers should keep in mind the following questions while attending the briefings:
  - Did the meteorologist use proper pace and tone for the requestor?
  - As with any public speaking, the speaker's pace and volume have an impact on the delivery of the weather information. The speaker should keep a deliberate pace which is not too fast or too slow.
  - Did the meteorologist use appropriate, non-technical language for the requestor?
  - The speaker should be aware of, or quickly assess, the weather knowledge of the requestor and provide information to the level of detail necessary for the understanding of the individual.

2.5 Did the briefing provide information consistent with other official weather sources?

- If applicable, review the content of the briefing to ensure consistent information is provided. The briefing contents should not contradict other forecasts without sound meteorological reasoning. Reviewers should keep in mind the following questions during the briefings. If the meteorologist deviates from other forecasts for the ARTCC area without sound meteorological reasoning, the Reviewer should mark this sub-element as "no."
  - Did the meteorologist deviate from other aviation forecaster valid for the ARTCC area?
  - If so, was the deviation justified?

2.6 Did the meteorologist clarify inconsistent forecasts?

- If applicable, review the contents of the briefing to ensure the meteorologist clarified inconsistent forecasts affecting the ARTCC's area. With the numerous products issued for each ARTCC area, the meteorologist should clarify any inconsistencies in the forecasts and provide a single, clear forecast to the requestor to assist with decision-making. If the meteorologist does not sufficiently clarify inconsistencies in the forecast products, the Reviewer should mark this sub-element as "no."

2.7 Did the meteorologist use sound meteorological reasoning?

- Review the contents of the briefing to ensure the meteorologist uses sound meteorological reasoning throughout the briefing. If the information is not, the Reviewer should mark this sub-element as "no."

2.8 Add additional comments…

- The Reviewer should note any actions taken by the CWSU meteorologist to eliminate inconsistencies in the forecasts for their area.
- The Reviewer should also note any best practices which could be used at other CWSUs.
- The Reviewer will provide specific information on a sub-element receiving a "no" check resulting in a "Fail" of the element.

Element 3 – TMU Support

Element 3 reviews the CWSU's support to their TMU. These questions should be addressed to the TMO or a designate at a minimum. Other members of the TMU may also be interviewed. The CWSU MIC, the WFO MIC, the AAWU MIC should not be present for this interview.

This element is to determine the effectiveness of the CWSU's support to the TMU.

Record the name of the interviewee.

3.1 Are the CWSU meteorologists anticipating your needs?

- Determine whether or not the CWSU is anticipating the needs of the TMU. This sub-element should address the situational awareness of the CWSU meteorologists to the changing needs of the TMU. If the Reviewer does not receive positive feedback on the following questions, the Reviewer will mark this sub-element as "no." The Reviewer should ask the following questions before determining the sub-element result.
  - Are the CWSU meteorologists aware of air traffic concerns and changing needs?
  - Do the CWSU meteorologists proactively provide weather information in an effort to assist you?

3.2 Are you receiving consistent weather information?

- Determine whether or not the CWSU provides consistent weather information to the TMU. The Reviewer should ask the following questions before determining the sub-element result.
    - Are the CWSU meteorologists providing consistent weather information or does the information conflict with other official weather sources?
    - Are the CWSU meteorologists clarifying and eliminating inconsistent weather information?

3.3 Are you satisfied with the service you receive from the CWSU?

3.4 What services from the CWSU best serve your needs?

- This question allows the interviewee to provide information on the best services the CWSU provides. This is not a "yes" or "no" question and *is not considered in the scoring of the element.*

3.5 What services from your CWSU are least helpful/useful?

- This question allows the interviewee to provide information on the services the CWSU provides which are the least helpful or useful. This is not a "yes" or "no" question and *is not considered in the scoring of the element.*

3.6 Add additional comments…

- The Reviewer should also note any best practices which could be used at other CWSUs.
- The Reviewer will provide specific information on a sub-element receiving a "no" check resulting in a "Fail" of the element.

Element 4 -- Designated Terminal Radar Control (TRACON) Support
Element 4 reviews the CWSU's support to their designated TRACON(s). These questions should be addressed to the air traffic Manager or a designate. The CWSU, WFO or AAWU MIC should not be present for this interview.

This element is to determine the effectiveness of the CWSU's support to the TRACON.

Record the name of the interviewee.

4.1 Are the CWSU meteorologists anticipating your needs?

- Determine whether or not the CWSU is anticipating the needs of the TRACON. This sub-element should address the situational awareness of the CWSU meteorologists to the changing needs of the TRACON. If the Reviewer does not receive positive feedback on the following questions, the Reviewer should mark this sub-element as "no." The Reviewer should ask the following questions before determining the sub-element result.

- Are the CWSU meteorologists aware of air traffic concerns and changing needs?
- Do the CWSU meteorologists proactively provide weather information in an effort to assist you?

4.2 Are you receiving consistent weather information?

- Determine whether or not the CWSU provides consistent weather information to the TRACON. The Reviewer should ask the following questions before determining the sub-element result.
  - Are the CWSU meteorologists providing consistent weather information or does the information conflict with other official weather sources?
  - Are the CWSU meteorologists clarifying and eliminating inconsistent weather information?

4.3 Are you satisfied with the service you receive from the CWSU?

4.4 What services from the CWSU best serve your needs?

- This question allows the interviewee to provide information on the best services the CWSU provides. This is not a "yes" or "no" question and *is not considered in the scoring of the element.*

4.5 What services from your CWSU are least helpful/useful?

- This question allows the interviewee to provide information on the services the CWSU provides which are liked the least. This is not a "yes" or "no" question and *is not considered in the scoring of the element.*

4.6 Add additional comments…

- The Reviewer should also note any best practices which could be used at other CWSUs.
- The Reviewer will provide specific information on a sub-element receiving a "no" check resulting in a "Fail" of the element.

Element 5 – Operational Evolution Plan (OEP) or Designated Terminal Support

Element 5 reviews the CWSU's support to their OEP or significant air traffic Control Towers (ATCT). These questions should be addressed to the air traffic Manager or a designate. The CWSU, WFO or AAWU MIC should not be present for this interview.

This element is to determine the effectiveness of the CWSU's support to the ATCTs.

Record the name of the interviewee.

5.1 Are the CWSU meteorologists anticipating your needs?

- Determine whether or not the CWSU is anticipating the needs of the ATCT. This sub-element should address the situational awareness of the CWSU meteorologists to the changing needs of the ATCT. If the Reviewer does not receive positive feedback on the following questions, the Reviewer should mark this sub-element as "no." The Reviewer should ask the following questions before determining the sub-element result.
  - Are the CWSU meteorologists aware of ATCT's concerns and changing needs?
  - Do the CWSU meteorologists proactively provide weather information in an effort to assist you?

5.2 Are you receiving consistent weather information?

- Determine whether or not the CWSU provides consistent weather information to the ATCT. The Reviewer should ask the following questions before determining the sub-element result.
  - Are the CWSU meteorologists providing consistent weather information or does the information conflict with other official weather sources?
  - Are the CWSU meteorologists clarifying and eliminating inconsistent weather information?

5.3 Are you satisfied with the service you receive from the CWSU?

5.4 What services from the CWSU best serve your needs?

- This question allows the interviewee to provide information on the best services the CWSU provides. This is not a "yes" or "no" question and *is not considered in the scoring of the element.*

5.5 What services from your CWSU are least helpful/useful?

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00158 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- This question allows the interviewee to provide information on the services the CWSU provides which are liked the least. This is not a "yes" or "no" question and *is not considered in the scoring of the element.*

5.6 Add additional comments…

- The Reviewer should also note any best practices which could be used at other CWSUs.

- The Reviewer will provide specific information on a sub-element receiving a "no" check resulting in a "Fail" of the element.

Element 6 -- CWSU Products and Services

This element of the CWSU Site Review determines the CWSUs adherence to appropriate policies in place governing the Products and Services provided by CWSUs. This assessment should be completed prior to the CWSU Site Review. These documents are:

- FAA/NWS Interagency Agreement and Statement of Work
- NWSI 10-803

Each CWSU should be operating in accordance with these two documents.

6.1 Center Weather Advisories (CWA)
This sub-element addresses the content and format of the CWAs.

6.1.1 Are CWAs clear and concise?

- The product should provide pertinent advisory information for the ARTCC area in a clear and concise manner.

6.1.2 Are CWAs in the proper format?

- The product should follow the format outlined in NWSI 10-803.

6.2 Meteorological Impact Statements (MIS)
This sub-element addresses the content and format of the MISs.

6.2.1 Are MISs clear and concise?

- The product should provide pertinent weather information affecting traffic in the ARTCC area in a clear and concise manner.

6.2.2 Are MISs in the proper format?

- The product should follow the format outlined in NWSI 10-803.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00159 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

6.3 CWSU operations in accordance with IA/SOW and local agreements?

The CWSU should conduct their operations in accordance with the FAA/NWS IA/SOW. Deviations are accepted with written local or regional agreement.

6.4 CWSU operations in accordance with NWSI 10-803?

The CWSU should conduct their operations in accordance with NWSI 10-803.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00160 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix B
CWSU Site Review Checklist

This appendix is a fillable PDF form.

#5

Federal Aviation Administration
Center Weather Service Unit
Requirements Document

Approved by: ______________________ Date: ________

Submitted by: ______________________ Date: ________

Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Table of Contents

FIGURES & TABLES

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00164 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

SECTION 1: INTRODUCTION

This document provides a new set of requirements and services to be provided by the National Weather Services's (NWS) Center Weather Service Unit (CWSU) that will enable the Federal Aviation Administration (FAA) to adapt to the increasing demands of capacity placed on the National Airspace System (NAS) and, in particular, to ensure the highest level of customer satisfaction. The period of performance for the new system will include a base period of one year with four, one-year option periods.

Since 1979 the CWSUs have been providing professional meteorological services to Traffic Management Units (TMU) for strategic aviation weather planning (documented in FAA Order 7210.38A). Today, 84 NWS employees located at 21 Air Route Traffic Control Centers (ARTCC) provide CWSU services to FAA traffic management personnel located at ARTCCs, Terminal Radar Approach Control Facilities (TRACON), Towers, and the Air Traffic Control System Command Center (ATCSCC).

To provide accountability, flexibility and to encourage innovation and creativity, this document utilizes a performance-based methodology for requirements development by establishing performance metrics and standards, performance requirements, and a Quality Assurance Surveillance Plan (QASP).

1.1 Purpose

The overarching purpose of this document is to establish a new set of weather forecasting and strategic weather service requirements that align with the current and future needs of the FAA, and for the FAA to obtain improved customer service. The FAA requests that the NWS recommend three (3) business model concepts that will provide innovative solutions to fulfilling the requirements needed.

1.2 Vision

The NWS will implement a business model concept that aligns with the requirements needed by the FAA today and into the future.

There are four main service improvements that are the drivers of change and part of the overall vision for operating under the new business model. These include the following:

1.2.1 Provision of a Performance-based Service

A performance-based service is a service that produces measurable results for both the user and the provider of the service. Measurement of the CWSU service will allow for the identification of both successful performance and problem areas within the service. A performance-based service also creates opportunities for increased communication between stakeholders and promotes continuous improvement.

1.2.2 24/7 Coverage

Currently, CWSU services provides 16/7 coverage. The FAA seeks 24/7 services that will provide continuous consultation and meteorological planning to its TMU customers.

1.2.3 Standardized Services

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00165 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Currently, CWSU services are provided differently across the NAS, which results in varying levels of service delivery from one ARTCC to another. The FAA requires a standardized set of services that will promote consistency.

1.2.4 National Scope of Weather Products and Services

Currently, the CWSUs are providing 21 individualized forecasts and weather products across the NAS. As a result, it is necessary at times to recalibrate decisions for each region throughout the NAS. National scope is created by transitioning the CWSUs to monitor the NAS, as opposed to their respective ARTCC regions. This national scope will allow for better, more integrated decision-making at a national level by ensuring access to information at facilities across the NAS. Regional and local forecasts will continue to provide more specialized products or services tailored to the needs of the customer.

SECTION 2: BACKGROUND

2.1 Mission Need

The primary function and responsibility of the CWSU is to provide meteorological advice and consultation which can be used for operational decisions made by traffic management personnel.

The CWSUs were established as a result of a National Transportation Safety Board (NTSB) report on the 1977 crash of Southern Airways flight 242. The findings recommended that a CWSU should be co-located at each of the 21 ARTCCs across the nation. Currently, the NWS provides this service through an interagency agreement with the FAA. The NWS has meteorologists stationed at each of the FAA ARTCC's to provide these services. The guidelines governing the CWSU are dictated in FAA Order 7210.38A

2.2 CWSU Services

CWSU services were reassessed as a combined result of FAA documented service deficiencies (e.g., fragmented service delivery and no national scope), the FAA's desire to move toward a performance-based weather forecasting service, and market research that indicated the capability to improve CWSUs through technological and service upgrades. [1] Additionally, according to the FAA's NextGen Operation Evolution Partnership, "in today's NAS, weather data are not well integrated into either the manual procedures or automated decision support systems, are not readily available to all decision makers, and are not sufficiently accurate." Improvements are needed to support the increased number of air traffic operations envisioned in the future.[2]

On June 9, 2006, the FAA began preliminary planning for the reengineering of the CWSU service. The reengineering is based upon the development of a new set of CWSU requirements that addresses the problems indicated in the preceding paragraph. The CWSU requirements development process is illustrated in Figure 1.1. The reengineering would affect approximately 84 Full-Time Equivalent (FTE) NWS employees at 21 locations throughout the United States. Due to the unique weather conditions affecting aviation in Alaska, the FAA is carefully considering whether to also include the Alaskan CWSU function in the reengineering effort.

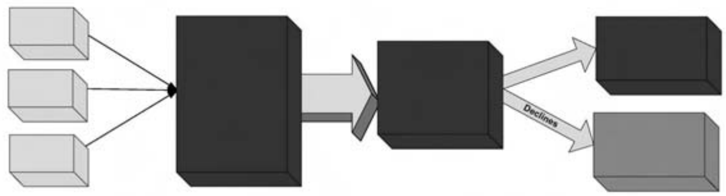
As a result of the preliminary planning, the FAA is presenting this document as a collaborative effort between the NWS and the FAA to improve the services offered by the CWSU. This service will meet the needs of the NAS required today and in the future. The requirements will form the basis of a new CWSU service that the NWS will present in three separate business model concept of operations by April 7, 2008.

---

[1] One such report is the Federal Aviation Administration *Activity Value Analysis of Center Weather Service Units (CWSUs)* January 27, 2006

[2] http://www.faa.gov/about/office_org/headquarters_offices/ato/publications/oep/version1/solutionsets/weather/

Figure 1.1: Fundamentals of the Requirements Development Process



2.3 Future Operations

To allow for the utmost creativity and innovation, the FAA requires the NWS to provide three options in the form of written responses for the provision of CWSU services. The written responses will be based upon the three business model options listed within this section. All three options will adhere to the FAA's requirements, performance metrics, and guidelines for submission contained within this document. The FAA will select one of the three options based on the three written responses submitted by the NWS. The overarching criteria for selection will be the degree to which the business model option aligns with the FAA's current and future needs. The framework for each of the three business model concepts follows this section.

FAA Orders

2.3.1 Remote Single Facility Approach

NWS will provide CWSU services by relocating all CWSU personnel to one centralized location. The meteorologists will monitor weather across the NAS and will be located with other aviation weather forecasters, offering an easy avenue for collaboration and the development of consistent products.

2.3.2 Remote Regional Approach

Survey Responses

NWS will provide CWSU services by consolidating 21 CWSUs into proposed regional centers. The relocated CWSUs should be centralized in areas with high impact air traffic and weather.

2.3.3 Non-Remote Approach

NWS will provide CWSU services by retaining all 21 locations at the ARTCCs, but will improve the service by addressing the new requirements and performance measures within this document.

Site Visits

SECTION 3: SCOPE OF WORK

The NWS will be expected to provide the services described in this section. These services should be integrated within a framework for operating in a performance-based environment of national scope that provides 24/7 coverage and standardized services. The NWS shall provide all personnel, equipment, materials, supervision, and other items and services necessary to perform all tasks and functions as defined in this requirements document. Additionally, the FAA encourages the NWS to offer an improved version of relevant products and services.

The primary function and responsibility of the National Weather Service is to provide meteorological advice and consultation to the Traffic Management Unit personnel including the ATCSCC, 21 Air Route Traffic Control Centers, TRACONs and Towers.

3.1.1.1 Weather Conditions

Monitor and seek sufficient weather information to provide timely advice on weather conditions which affect, or have the potential to affect, air traffic services or aircraft operations within the NAS. Examples include the following:

(1) Thunderstorm location and intensity
(2) Areas of precipitation
(3) Cloud coverage to include marine stratus at San Francisco
(4) Icing levels
(5) Turbulence
(6) Winds aloft
(7) Low level wind shear
(8) Cross winds
(9) Areas of less than 3 miles visibility and/or ceiling less than 3,000 feet
(10) Significant pressure changes (as defined in NWSI 10-803)
(11) Volcanic ash
(12) Other types of severe weather to include, but not limited to, tornado threat activity, hurricane threat activity, and hail

3.1.2 Weather Products

Weather products created by the CWSU will be distributed to all relevant traffic management personnel through NWS and FAA communications systems.

3.1.2.1 CWSU Briefings

CWSUs shall conduct both on-demand briefings and scheduled briefings. On-demand briefings are briefings provided by the CWSU upon request from the affected ATCSCC, ARTCCs, TRACONs, and Towers. Scheduled briefings occur twice daily upon shift changes for traffic management.

CWSU briefings shall consist of an at least 12-hour forecast of weather conditions expected to adversely impact air traffic across the NAS. Each briefing shall contain sufficient information for Air Traffic Control (ATC) and TMU managers to make decisions and appropriate operational adjustments according to the impact of specific weather conditions.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00169 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

All CWSU briefings should be recorded for later reference by traffic management personnel for aviation weather planning purposes. The recording should also be in a format that allows for later forecast accuracy analysis. The briefing should be disseminated to those supported facilities which do not normally receive the CWSU briefing.

The following information shall be included in the scheduled briefing:

1) Advisories in effect at the time of the briefing; e.g., Significant Meteorological Information (SIGMETs), Airmen's Meteorological Information (AIRMETs), airport weather warnings, Center Weather Advisories (CWA), etc.
2) Synopsis - discussion of weather systems and their movements.
3) An outlook on en route flight conditions, e.g., convective weather, turbulence forecasts, icing forecasts, volcanic ash, etc.
4) TRACON and terminal weather, e.g., thunderstorms, heavy snow, freezing precipitation, low Instrument Flight Rule (IFR) ceiling and/or visibility, operationally significant surface winds, marine stratus, etc.
5) Wind direction and speed at key flight levels, including jet stream location(s), airport crosswinds, and low level wind shear (surface-2000 feet).
6) Other weather items affecting NAS operations.

Local requirements may determine the order of items 2-6.

If conditions for a scheduled briefing change, or are expected to change, a modification to the briefing should be issued to all relevant traffic management personnel through FAA communication systems. The modification shall be valid up to 12 hours detailing weather conditions expected to adversely impact air traffic flow across the NAS. For planning purposes, the modification should be consistent with other products, such as those issued by the Aviation Weather Center (AWC), other national centers, and the Weather Forecast Offices. If further modifications are necessary, a system shall be put in place to track the modifications as well as to ensure the new modification will be comprehensive enough to replace the old modification.

3.1.2.2 Center Weather Advisory (CWA)

The CWA is an aviation weather warning for conditions meeting or approaching national in-flight advisory (AIRMET, SIGMET or SIGMET for convection) criteria. The CWA is primarily used by air crews to anticipate and avoid adverse weather conditions in the en route and terminal environments. It is not a flight planning product because of its short lead time and duration. Additionally, the CWA should be meteorologically consistent with other products and reflect conditions at the time of issuance and/or in the near future. If a CWA has been issued prior to coordination, notification to the appropriate offices, national center, or Weather Forecast Office (WFO) will follow as soon as higher priority duties permit.

CWAs shall be valid for up to two (2) hours and may include forecasts of conditions expected to begin within two (2) hours of issuance. If conditions are expected to persist after the advisory's valid period, a statement to that effect shall be included in the last line of the text. Additional CWAs will subsequently be issued as appropriate. Notice of significant changes in the phenomenon described in a CWA shall be provided by a new CWA issuance for that phenomenon. If the forecaster deems it necessary, CWAs may be issued hourly for convective activity.

The Urgent CWA (UCWA) communications header is intended for those situations where unforecast weather conditions occur and have an immediate effect on the safe flow of air traffic within the area of responsibility. It should only be used when the CWSU meteorologist believes any delay in dissemination to FAA facilities would impact aviation safety. Use the routine CWA header for subsequent issuances of the same phenomenon. CWAs may be issued for the same phenomena described in advisories and forecast products issued by WFOs, the AWC, or the National Centers for Environmental Prediction (NCEP).

There are four (4) situations in which a CWA shall be issued:

1) When existing or anticipated weather conditions do not meet national in-flight advisory criteria (i.e., in terms of intensity or areal coverage) but current Pilot Reports (PIREPs) or other weather information sources indicate those conditions, in the judgment of the meteorologist, will adversely impact the safe flow of air traffic within the ARTCC area of responsibility.
2) As a supplement to an existing in-flight advisory. The issuance of a CWA in this circumstance should be limited to occasions when, in the judgment of the meteorologist, a redefining statement or update, in advance of a new national advisory, is adequately supported by real-time information. The purpose of the CWA in this case is to improve upon or update the existing advisory's description of the phenomenon. These improvements may be to make the location more relevant to users or to be more precise in describing the location, movement, extent, or intensity of the phenomenon. For example, a CWA describing the specific area(s) of low Instrumental Flight Rules (IFR) conditions within an ARTCC area would be a valid redefinition of the location and intensity relative to the ARTCC area and meeting documented requirements.
3) When an in-flight advisory has not been issued, but observed or expected weather conditions meet in-flight advisory criteria (based on current PIREPs and/or other sources of information). The meteorologist shall call the appropriate forecaster at the AWC, Alaska Aviation Weather Unit (AAWU), or WFO Honolulu to coordinate. If the meteorologist believes it is necessary to issue a CWA to allow lead time while the national in-flight advisory is being prepared, a UCWA will be issued indicating an AIRMET or SIGMET will be issued shortly.
4) To cancel a CWA when the phenomenon described in the CWA is no longer expected. Use the next higher number in sequence and ensure the valid time is at least 30 minutes in length.

3.1.2.3 Collaborative Convective Forecast Product

The Collaborative Convective Forecast Product (CCFP) is a forecast of convection in the extended range (2-6 hours) for the contiguous United States (CONUS) that is produced by the NWS Aviation Weather Center in collaboration with the CWSUs and National Air Space (NAS) stakeholders. The CWSUs shall continue to participate with the AWC and industry participants.

3.1.3 Forecast Coordination

Forecast products issued by WFOs, AWC, AAWU, other National Centers for Environmental Prediction (NCEP) centers, and CWSUs often address the same spatial and temporal events. Meteorologists shall strive to ensure forecasts, advisories, or information they provide are consistent with other forecast products, whether those products are issued locally or by other NWS offices. Coordination with responsible NWS offices prior to product issuances is important and necessary, especially when those products concern unexpected or suddenly changing observed weather conditions. This coordination prevents or minimizes confusion to end users impacting aviation safety. In the interest of preserving forecast consistency, the responsible agency's decision on the forecast product is considered final.

3.1.4 On-Demand Access

The NWS shall be capable of immediately providing advice and consultation to on-demand inquiries or requests from ARTCCs, the ATCSCC, TRACONs and Towers. On-demand responses should be consistent with other forecast products. Responses may take multiple forms, e.g., creation of specific graphical products or images, verbal answers, or text summaries.

3.1.5 Emergency Planning

The CWSU has an integral role in assisting in pre and post emergency situations by providing weather guidance for aircraft in weather-related emergencies and in gathering weather information for incident and accident reports.

3.1.6 Technical Requirements

The CWSU will be responsible for the dissemination of the following information into both NWS and FAA systems:

- PIREPS
- AIRMETS
- SIGMETS
- CWA
- Recorded briefings

The CWSU should maintain updated information for graphic briefing displays of CWSU products. Additionally, as a user of FAA technological systems, the CWSU should provide recommendations to Technical Operations and Air Traffic regarding usage of Next Generation Radar (NEXRAD) and the Weather and Radar Processor (WARP) should improvements or problems exist with the systems.

3.1.7 Training

The CWSU should develop and provide weather familiarization training regarding CWSU weather equipment, products and services as required by traffic management personnel, weather coordinators, Certified Professional Controllers, and the ARTCC and ATCSCC facility managers.

3.1.8 TRACON Weather Forecast Guidance

As required, CWSUs shall assist with the development of a TRACON Forecast Product and with the dissemination and analysis of information collected.[3]

The requirements supporting the TRACON Forecast Product would benefit the overall Collaborative Decision Making community and are based upon a review of existing programs from CWSUs across the NAS, and industry practices. Example programs include the Tactical Decision Aid (TDA), where the TAF is put into graphical form showing weather conditions expected over the next 12 hours for the terminal space, and the Weather Impact Decision Aid used in Fort Worth that manually generates 6-hour thunderstorm forecasts. The requirements include the following:

[3] In May 2007 the Weather Evaluation Team (WET), a collaborative team consisting of aviation meteorological stakeholders from industry and the FAA was tasked to provide detailed requirements for possible development of a TRACON Forecast Product.

1. The area covered by the forecast must be tailored to meet the needs of individual TRACON facilities and major operators. The forecasts must be designed to provide information for the entire volume of airspace and not restricted to forecasts for single points.

2. The forecast should include convection, winds, ceilings and visibilities. Forecasts of convection should be the highest priority while development of forecasts for the other weather variables should be a secondary priority. Inability to implement visual separation due to ceiling or visibility and compression on arrival due to winds are examples of other variables and their impact on air traffic.

3. All forecasts will be of a probabilistic nature. Due to the inherent uncertainties of state-of-the-art weather forecasts and the current level of sophistication of air traffic managers both within the airlines and the FAA, now is an appropriate time to begin using probabilistic forecasts of convection as well as probabilistic forecasts of other variables listed in #2. Probability of occurrence of any weather conditions less than 30% is currently defined in ICAO Annex 3 definition of TAFs as not necessary. But for the purpose of the TRACON product, inclusion of information regarding less than 30% is requested. Specifically regarding convection, the minimum specified probability of occurrence for convection will be 30%. Values less than this should be shown without further breakdown.

4. The forecast should be for any convection that is expected to occur in the TRACON airspace and for the other weather variables identified in recommendation 2. The definition of convection, for forecasting purposes, should be the focus of further WET study along with user input to provide an agreed definition taking into account intensity and coverage.

5. The forecast should be for 0-6 hours.

6. The forecast output should be 1 hour smears rather than snapshots (e.g., 0-1, 1-2, 2-3, 3-4, 4-5, 5-6).

7. The forecast should include information in a graphical format that can be animated. Where appropriate the graphics should also contain additional information in text format in order to enhance user understanding and application for decision making.

8. The forecast should be updated at a minimum of every 2 hours. The update rate may be more frequent if the forecast is not verifying or if unanticipated changes in the actual or forecasted weather are occurring. The 2 hour update will coincide with the planning teleconferences and CCFP issuances.

9. The forecast should be initiated by automated grids (such as the NWS National Digital Forecast Database (NDFD) or a numerical weather prediction model). The grids should have a resolution of $\leq$ 5 km. These automated grids should be reviewed and adjusted as necessary by meteorologists.

10. To avoid different TRACON weather forecasts among CDM participants, forecast product production must be designed to ensure that all possible, qualified meteorological input is considered. This includes both automated forecast models as well as the input of qualified meteorologists from both FAA and operator stakeholders. However, a lead organization needs to be designated that will assume the role of final arbitrator and dissemination of the product.

11. Forecast product production must be designed to ensure consistency, whenever possible. This includes consistency with any other products that FAA and operator decision makers access (for example, TAF, CCFP, ITWS, and CIWS). Conversely, if FAA Air Traffic Management decisions for a TRACON are being based on additional forecast products, those products must be made available to all stakeholders, both FAA and operators.

12. Accompanying the product will be methods for verification and the systematic collection of user feedback from both the FAA and industry. These methods will be designed and implemented in order to measure the accuracy and usefulness of the product.

13. User training needs to accompany the product.

14. A Concept of Use needs to accompany the product which will outline guidelines for the interpretation and use of the product. It is envisioned that the product will have more granularity than the CCFP and thus specific traffic management actions will be initiated when none would have been taken with the CCFP. Thus the concept of use needs to include information such as the following which is provided as an example: the product will be used to initiate discussions among relevant users and will include general guidelines such as the following:

    a. Forecasts of < 30%: No actions taken.
    b. Forecasts of 30 - 50%: Begin contingency planning with users as to possible traffic management initiatives.
    c. Forecasts of 50 - 70%: Finalize contingency planning with users on specific initiatives to take upon the identification of appropriate triggers (for example, the first observations of convection).
    d. Forecasts > 70%: Activate plans as coordinated among users.

15. The FAA has identified the minimum number of TRACONs listed below that will require a TRACON weather forecast. These areas were based upon traffic volume and are subject to change.

- Northern California
- Southern California
- New York
- Potomac
- Chicago
- Dallas Ft. Worth
- Houston
- Atlanta
- Miami
- Denver

SECTION 4: PERFORMANCE MANAGEMENT

4.1 Performance Requirements Summary

The following table presents the PRS, which identifies key performance measures for quality and timeliness by the IA reference number.

Technical Exhibit # D-1: Draft Performance Requirements Summary

The columns are defined as follows:

Performance Measure - Indicates the outcome by which the agency will monitor SP performance

Performance Measure Definition - Provides a description and context for which the performance measure will be calculated.

Applicable Services - Indicates the services to be evaluated using the stated performance measure

Acceptable Performance Level (APL) - Indicates the performance level that is acceptable by the Government for a given performance measure

Evaluation Frequency - Indicates standard period when performance will be evaluated adjustable at the discretion of the Government.

Data Source - Indicates the primary source of information that will be used to evaluate performance.

Surveillance Method - Indicates the primary technique for monitoring and evaluating performance.

Primary Metrics

ID	Performance Measure	Performance Measure Definition	Applicable Services	Acceptable Performance Level (APL)	Evaluation Frequency	Data Source	Surveillance Method
1	**CWSU Customer Satisfaction Index**	The resulting index rating is based on a series of questions gauging customer satisfaction with quality, timeliness, accuracy, customer service, number of validated complaints of the CWSU services received.	Aggregate, By Service	>85 %	Quarterly	TMU survey sample	Document Review
2	**Service Delivery Conformity Index Score**	The resulting score based on a standard evaluation process whereby ratings in the provision of both standardized and customized services equate to a conformity index score for aviation weather services for each facility evaluated.	Aggregate	> 84 %	Periodic	FAA Traffic Management Web-based evaluation form	TMU data entry and document review
3	**Time to Respond to Request for On-demand Service**	The sum of requests per week directed at the CWSU and answered within a specific time designated divided by total requests received per week.	Aggregate	Time Oriented	Quarterly	Telecommunication Records	Document Review
4	**Accuracy of Forecast**	The direct correlation of forecast generated by the CWSU, weather events that actually occurred, and actions taken by the TMU based upon the meteorological services provided.	Aggregate	NWS to propose APL	Quarterly	NWS to propose data source and analysis methods for approval by FAA	Document Review
5	**Number of Aircraft Incidents Attributed to Inaccurate Aviation Weather Forecasts**	The sum of all year-to-date aircraft incidents attributed to inaccurate aviation weather forecasts.	Aggregate	<1%	Upon occurrence of aircraft incident	ATO Safety Statistics	Document Review

4.2 Performance Measures

4.2.1 Performance Measure #1: CWSU Customer Satisfaction Index

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
CWSU Customer Satisfaction Rating	The resulting index rating is based on a series of questions gauging customer satisfaction with quality, timeliness, accuracy, customer service, number of validated complaints of the CWSU services received.	>85%	TMU survey sample	Document review

4.2.1.1 Data Source Description

The customer satisfaction rating will be based upon TMU responses to CWSU services in a questionnaire, developed by the FAA, containing the following customer service indicators:

- Quality
- Timeliness
- Accuracy
- Customer Service
- Number of validated complaints

4.2.1.2 Primary Surveillance Method(s)

[illegible]	
Frequency:	Quarterly
Actions:	Administration of a customer service questionnaire

4.2.2 Performance Measure #2: Service Delivery Conformity Index Score

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Service Delivery Conformity Index Score	The resulting score based on a standard evaluation process whereby ratings in the provision of both standardized and customized services equate to a conformity index score for aviation weather services for each facility evaluated. Note: Checklist of standardized and customized local weather services will be used to determine score.	>84%	FAA Traffic Management web-based evaluation form	TMU data entry and document review

4.2.2.1 Data Source Description

A web-based evaluation form will be made available to Traffic Management Coordinators that indicates the items that should be included in daily briefings and products.

4.2.2.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	The web-based evaluation form will include a list of briefings and meteorological products and services. The items should be those covered in 7210.38A, as well as those specific to individual facility needs such as the San Francisco marine stratus forecast.

4.2.3 Performance Measure #3: Time to Respond to Request for On-demand Service

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Time to Respond to Request for On-demand Service	The sum of requests per week directed at the CWSU and answered within a designated time divided by total requests received per week.	Time oriented	Telecommunications records	Document review

4.2.3.1 Data Source Description

A telecommunications record keeping system must be in place to record requests made by the TMU directed at the CWSU for meteorological forecasting services.

4.2.3.2 Primary Surveillance Method(s)

Frequency:	Quarterly
Actions:	Record review by Quality Assurance Evaluator

4.2.4 Performance Measure #4: Accuracy of Forecast

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Accuracy of Forecast	The measure of the correlation of forecasts generated by the CWSU, weather events that actually occurred, and actions taken by the TMU based upon the meteorological services provided.	NWS to propose APL	Quarterly	Document review

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00177 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

4.2.4.1 Data Source Description

An evaluation mechanism should be put in place where CWSU services and products will be analyzed for meteorological accuracy after the occurrence of weather. This will require that CWSU services and products are recorded using a method determined by the CWSU. The recorded information will later be compared by the NWS with actual weather occurrences and Traffic Management Initiatives for forecast accuracy.

Frequency:	Quarterly
Actions:	Subject matter expert analysis of recorded data

4.2.5 Performance Measure #5: Number of Aircraft Incidents Attributed to Inaccurate Aviation Weather Forecasts

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Number of Aircraft Incidents Attributed to Inaccurate Aviation Weather Forecasts	The sum of all year-to-date aircraft incidents attributed to inaccurate aviation weather forecasts	< 1%	ATO Safety Statistics	Document Review

4.2.5.1 Data Source Description

ATO Safety keeps track of aircraft incidents and can be leveraged to determine meteorological support forecasts in comparison to flight plans.

4.2.5.2 Primary Surveillance Method(s)

Analysis of ATO safety findings

Frequency:	Upon occurrence of an aircraft incident
Actions:	Investigation of occurrence to determine accuracy of forecasts

4.3 Quality Assurance Surveillance Plan

Please see attached document

SECTION 5: GENERAL REPORTING REQUIREMENTS

5.1 Records Management

The NWS shall create and maintain files that document the processing of work and other associated information. Examples of files include official government information in accordance with NWS Instruction 10-803, Support to Air Traffic Control Facilities, and FAA Order 7210.38, station duty manuals and operational desk guides. The NWS shall maintain files in chronological order by subject and be complete, including all referenced attachments, enclosures and/or exhibits.

The FAA retains ownership of all files, concerning the processing of work and other associated information that the NWS collects and maintains. In the event of default, or non-performance, the FAA will have access to all records. When the period of performance expires the NWS shall turn over all such records to the FAA.

5.2 Performance Data

The NWS shall be required to track, record, and monitor performance based on the information provided in the QASP and PRS. Both the FAA and the NWS will utilize the information gathered to establish a baseline for measuring performance with the intent of enhancing the level of customer service and changing or modifying metrics as needed over time. The NWS shall identify the staffing, process and technology needed for supporting this function within Volume 1 of the technical response (see Section 6.1.1).

5.3 Transition Reporting

The NWS shall be required to meet on a monthly basis with the FAA to report on the progress made toward the transition to the designated business model. In addition, a written transition report should include the following information, at a minimum:

- Progress in meeting scheduled tasks and milestones, in accordance with the transition plan provided in the technical response of Volume 1
- Accomplishments to date, along with challenges and proposed solutions
- Progress toward meeting budgeted costs, identifying both under-runs and over-runs

The table below identifies the due dates for written reports on the status of the transition

	Business Model 1: Non-Remote - 90 days	**Business Model 2: Regional – 180 days**	**Business Model 3: Single – 1 year**
Reporting Requirements	Monthly, in person or conference calls Written reports due at end of 45 and 90-day period	Monthly, in person or conference calls Written reports due at end of 90, 120, 180-day period	Monthly, in person or conference calls Written reports due at each quarter

Table 1: Reporting Requirements Progress

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00180 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

5.4 Operational Changes

The NWS shall perform the services and requirements detailed in Section 3 of this document as well as the supporting reporting specifications and Government orders established with the FAA. The NWS shall identify potential process improvements designed to improve customer service and reduce costs, to the extent possible, thereby promoting an overall more efficient service. During the execution of the agreement between the FAA and the NWS, if the NWS determines that a current service or requirement restricts the efficient delivery of the CWSU services, the NWS shall submit an Operational Change Proposal (OCP) to the FAA for review and approval. Once the OCP has been reviewed and approved, the NWS should implement the change.

The Operational Change Proposal should include the following information:

- Affected Requirement or Directive: Reference (e.g., Requirement or directive, section, paragraph, page) impacted policies, orders, methodologies, procedures, and regulations regarding the delivery of strategic weather services.
- Recommended Change: A description of the change, including new wording to be included as part of the requirement or directive.
- Reason for Recommendation: The benefits for implementing potential change and the implications if it is not implemented.
- Potential Impact: The changes required to implement the OCP. Changes may impact facilities, systems, people, requirements, directives, training, and other resources in the agency.
- Recommended Schedule for Implementation: The timeline for implementation.

5.5 Contract Data Requirements List

The table below summarizes the key reporting documents that the NWS will be responsible for providing to the FAA.

CDRL NUMBER	Title	Reference
001	Quality Management Plan	4.3 (subsection 3.3), 6.1.3.3.3
002	Transition Reports	5.3
003	Operational Change Proposal	5.4
004	Facilities Implementation Plan	6.1.3.2.2

Table 2: NWS Reporting Documents

SECTION 6: GUIDELINES FOR WRITTEN RESPONSES

6.1 Format and Content

The instructions provided in this section are intended to serve as guidelines in preparing written responses.

6.1.1 Specifications

The NWS should prepare a separate technical and cost volume for each of the three (3) business models that are under consideration. Volume 1 represents the technical volume and volume 2 represents the cost volume. To ensure consistency in the documentation prepared, written responses shall comply with the following guidelines:

- Paper size: 8.5 x 11 inch paper
- Margins: 1-inch
- Spacing: single
- Font: Times New Roman, 12 point.
- Number of pages: Volume 1 shall not exceed 35 single-sided pages for each business model. Volume 2 has no page limitations. The cover page and a table of contents are excluded from the page limitations.

6.1.2 Structure

The NWS should submit a combined total of three (3) separate technical written responses and three (3) corresponding separate cost written responses as a result of the FAA's request for how to improve the efficiency and effectiveness of the CWSUs. Each of the areas to address in the technical and cost volumes is described in the sections that follow.

6.1.3 Volume 1: Technical Written Response

This section comprises the technical response for Volume 1. The NWS should use the information contained below to write three (3) separate technical written responses that correspond to each business model under consideration.

6.1.3.1 Cover Page

The cover page should include the words "Technical Written Response" and the following:

- Identify the business model as 1: Non-Remote, 2: Regional or 3: Single
- Main point of contact to include salutation, first and last name, telephone and electronic email address
- Date the written response was prepared

6.1.3.2 Technical Approach

The FAA requests that the NWS provide information on the areas identified below for each business model.

6.1.3.2.1 Technical Plan

The NWS should describe an approach supporting each model that reflects a sound, effective and creative way to conduct business. The NWS is encouraged to offer an improved version of relevant products and services, but must show how the benefits outweigh the costs of improving the product or service. Information shall include, but is not limited to, the following:

- Description of the methodology for providing the required services within the business model framework
- Description of current and future technologies intended for use
- Description of proposed changes to operational processes
- Description of anticipated challenges and recommended approaches for their resolution
- Provide a Quality Assurance Surveillance Plan (QASP) relevant to monitoring performance and additional performance metrics that support the FAA's mission. The CWSU will assist the FAA in collecting data, thus making the type and number of measures critical to assessing performance efficiently.

6.1.3.2.2 Facilities Plan

The NWS should describe the following in its written response:

- Changes to the equipment, facilities and tools planned for use in day-to-day operations during the period of performance, which includes one base year and four option periods
- The number, location, and availability of the facilities, tools and equipment

Within 60 days of acceptance of the proposed business model concept, the NWS shall provide the FAA with a detailed Facilities Implementation Plan, if applicable. The Facilities Implementation Plan provides the framework for the process of implementing the changes outlined in this section of the Technical Response.

6.1.3.3 Management Approach

The following sections comprise the main areas of the Management Approach that the NWS should address in its written response.

6.1.3.3.1 Organizational Structure and Staffing

The NWS should (1) describe the organizational structure and staffing of the CWSU under the new business model, and (2) describe its approach to effectively managing changes under the new organization. Information shall include, but is not limited to, the following:

- Organizational charts that illustrate the CWSU team and lines of authority
- The number of staff proposed to support each business model concept during the base year and option periods, their grade and skill type
- Description of the processes and methods intended for use of this effort, including, but not limited to, cost, schedule, and risk management
- Description of innovative ways the NWS will induce cultural changes to the CWSUs
- Identification of skill gaps generated as a result of the transition to a new business model and solutions for reducing this gap as well as how to orientate employees to the new business model

6.1.3.3.2 Key Personnel

The NWS should identify the key people assigned to managing the day-to-day operations of the CWSU unit(s) under the proposed business model, their grade, and how their experience aptly prepares them to manage staff and operational processes.

6.1.3.3.3 Quality Management Plan

The NWS should implement a Government approved Quality Management Plan (QMP) (CDRL 001). The QMP shall address the NWS's quality management organization, personnel, processes and procedures. The NWS's QMP shall be consistent with ISO 9000:2000 objectives and in full consideration of the FAA's QASP. Quality Management incorporates all aspects of Quality Assurance and Quality Control necessary for the NWS to meet its requirements. The NWS shall also track and report all service and performance discrepancies. The QASP identifies the methods the FAA will use to measure the performance of the NWS against the requirements identified by the FAA.

The FAA and NWS will work in partnership during the first 6-month period of performance to reach agreement on the methodology, sample size, and source for each performance measure and in ensuring that the data is accurate and collectible.

The FAA will review performance with the NWS on a quarterly basis. If the NWS successfully meets the established performance standards, then the FAA will exercise option 1 of the agreement between the FAA and the NWS.

6.1.3.4 Board of Performance and Cost Review

The NWS will propose a Board of Performance and Cost Review (BPCR) made up of both NWS and FAA representatives. The BPCR provides an opportunity for the FAA and the NWS to exchange information regarding the impact of proposed changes on the quality of CWSU services, including changes to the QASP. In this role, the BPCR may address concerns regarding systemic performance issues elevated to their attention. The NWS may also discuss discrepancies in the surveillance conducted or data collected by the FAA.

6.1.3.5 Transition Plan

The FAA will work with the NWS to ensure a seamless transition to the new business model. The NWS shall be responsible for transferring staff, while the FAA will assist with relocating equipment and securing the necessary facilities along with any other operational responsibilities that reside with the FAA. The transition plan shall include, but not be limited to, the following information:

- Description of the implementation plans and procedures necessary for a smooth transition to business model 1, 2 and 3. The NWS should assume the following allotted time periods for each business model:
  - Business Model 1: Non-remote: 90 days (3 months)
  - Business Model 2: Regional: 180 days (6 months)
  - Business Model 3: Single: 365 days (1 year)
- Description of the additional resources needed to facilitate the transition beyond currently provided government furnished equipment, property (facilities), and materials. The FAA will coordinate with the NWS on the purchase, physical transfer, or return of FAA property.
- Description of how the NWS will relocate personnel and assign new duties, technologies and operational processes.

- Description of the management techniques or processes the NWS will employ to ensure a seamless transition.
- Schedule that identifies the major tasks, milestones, and steps required for the transition.

6.1.4 Volume 2: Cost Written Response

This section comprises the cost written response for Volume 2. The NWS shall use the information contained below to write three (3) separate cost written responses that correspond to each business model under consideration.

6.1.4.1 Cover Page

The cover page should include the words "Cost Written Response" and the following:

- Identify the business model as 1: Non-Remote, 2: Regional or 3: Single
- Main point of contact to include salutation, first and last name, telephone and electronic email address
- Date the written response was prepared

6.1.4.2 Cost Plan

The NWS should identify the costs associated with each business model under consideration during the period of performance, which includes a base period of one year and four, one-year option periods.. The cost plan shall include, but not be limited to, the following information:

- Staffing – Identify the current level of staffing across CWSUs and the costs incurred or saved as it relates to GS level and grade for transitioning to business model 1, 2 and 3. If relevant, identify the number of staff who will retire and the anticipated number of new hires. Identify whether any training will be required, the type and an estimated cost as well as relocation costs.
- Resources – Identify the resources needed to ensure a smooth transition to each of the three business models and provide an explanation of the associated costs. Resources refers specifically to the additional equipment, tools and technologies that will be needed to support each business model. Indicate what the current estimated resources costs are and the costs incurred or saved as a result of transitioning to business model 1, 2 or 3.
- Facilities – Identify the proposed location(s) of the new facilities required for each business model and an explanation of the cost for the square footage. Identify whether there is an existing facility available to support the CWSU unit and the cost of its operations and whether there are any construction costs associated with providing the support the services required.

The NWS should utilize an Excel spreadsheet to organize and provide detail on the elements comprising the cost plan as well as create a work break down structure (WBS) using Microsoft Project to show, by month, the staffing, resources, facilities, overhead, and general and administrative (G&A) costs.

For each of the three business model concepts, the NWS should demonstrate how annual cost savings and efficiencies will be achieved over the 5-year period. Percent targets should be established and validated.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00185 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

6.2 Due Date for Written Responses

The due date for written responses shall be no later than 120 days after release of this document to the NWS.

SECTION 7: SUPPORTING DOCUMENTATION

7.1 NWS Instruction 10-803, Support to Air Traffic Control Facilities

7.2 Interagency Agreement No. DTFAWA-06-X-80003 Between the FAA and NOAA/NWS

7.3 FAA Order 7210.38A

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00187 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

#6

Federal Aviation Administration

CENTER WEATHER SERVICE UNIT

QUALITY ASSURANCE SURVEILLANCE PLAN

Focal Point

COTR
Mark Marchese

Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

TABLE OF CONTENTS

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00189 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

SECTION 1: INTRODUCTION

1.1 Purpose

This Quality Assurance Surveillance Plan (QASP) describes the procedures that the FAA uses to monitor and measure performance of the Center Weather Service Unit (CWSU) based upon requirements submitted by the FAA as outlined in the FAA-NWS Interagency Agreement (IA). Under the direction of the QASP, the Federal Aviation Administration (FAA) makes quantitative and qualitative assessments of overall National Weather Service (NWS) performance.

The QASP focuses on performance measures regarding the quality, accuracy, and timeliness of CWSU services as well as compliance with specific CWSU requirements. Each performance measure reflects the outcome by which the FAA monitors NWS performance. The FAA uses a combination of surveillance methods such as inspection, direct observation, surveys, and document review. Each method of surveillance relies on data from a specified data source. The FAA retains the right to modify or change the surveillance process at any time.

1.2 Relationship to the CWSU Requirements Document

This QASP supplements the CWSU Requirements Document as an advisory document, directing the FAA's process of overseeing NWS performance. It provides for effective and systematic surveillance of CWSU services to ensure that the NWS is in accordance with the requirements of the Interagency Agreement (IA), herein referred to as "IA".

The QASP acts as a point-in-time, living document that reflects the FAA's current approach to surveillance. The FAA will update the QASP to reflect changes to performance measures, surveillance methods, and other facets of the quality assurance process.

1.3 Format

The QASP has five sections as follows:

- Section 1 – Introduction – Provides a broad overview of this QASP;
- Section 2 – Quality Assurance Overview – Describes the overall surveillance approach;
- Section 3 – Roles & Responsibilities of the FAA, NWS, and Users – Identifies key roles and responsibilities in the surveillance process;
- Section 4 – Quality Assurance Execution Strategy – Describes schedule, methods, and reporting process for surveillance of NWS performance; and
- Section 5 – Surveillance Adjustments – Describes the impact of NWS performance and CWSU operational environment on increasing or decreasing level of surveillance.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00191 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

SECTION 2: QUALITY ASSURANCE OVERVIEW

2.1 Introduction

The FAA evaluates NWS performance of CWSU services to ensure that the NWS adheres to the IA and meets performance measures within the Performance Requirements Summary (PRS). The PRS, which is included with the IA (located in Appendix A), lays out the NWS specific performance measures for particular IA requirements. In discussing quality assurance, the IA, PRS, and the QASP use specific terms defined as follows:

- Performance Measure - An outcome of CWSU service which the agency uses to monitor NWS performance;
- Performance Measure Definition - A description and context for calculating the performance measure;
- Applicable Services - The services to be evaluated using the stated performance measure;
- Acceptable Performance Level (APL) - The quantitative performance level that is acceptable by the FAA for a given performance measure;
- Evaluation Frequency - A standard period when performance is evaluated which is adjustable at the discretion of the FAA;
- Data Source - The primary source(s) of information that is used to calculate performance levels and/or evaluate performance; and
- Surveillance Method - The primary technique or method for monitoring and evaluating performance.

2.2 IA Compliance Oversight

In accordance with Acquisition Management System (AMS) policies and other FAA procedures, the FAA employs a variety of surveillance methods to evaluate NWS adherence to NWS specific requirements in the IA. The QASP describes the strategy – including roles, responsibilities and approaches -- used by the FAA to monitor aspects of IA compliance that are not specifically addressed in the PRS. (The next section describes how the FAA monitors performance measures within the PRS.)

In response to the NWS proposal, the FAA develops an oversight process that considers risk and other factors critical to successful NWS performance. The FAA considers the following criteria when selecting specific requirements for compliance evaluation:

- Criticality to supporting safe and efficient flight;
- User complaints and customer satisfaction survey results;
- Period of IA performance (e.g., Phase-In); and
- Pending or present changes in the CWSU operational environment.

2.3 Performance Requirements Summary

The PRS establishes performance measures corresponding to requirements within the IA. While the NWS is ultimately responsible for the performance and quality of all products and services specified in the contract, the PRS provides a means of comparing the performance outcomes of the NWS to those performance levels determined acceptable by the FAA, known as APLs. The QASP measures the degree to which the accuracy, quality, and timeliness of products and services provided by the NWS conform to APLs established within the PRS.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00192 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

The PRS is structured to address both organization-wide and service-specific performance. FAA assesses performance results on both national and facility levels. Measures included reflect the overall performance goals of the FAA in addition to fulfillment of specific IA requirements. The absence of any IA requirement from the PRS does not detract from its enforceability or limit the rights or remedies of the FAA under any other provisions of the contract.

The measures created are considered primary measures. The primary measure is the main indicator of organizational impact, and provides an overall determination on whether the CWSU is succeeding or failing in its new operational capacity.

The PRS conveys the following information:

- Performance measures that describe the characteristics of outcomes resulting from required tasks;
- APLs the FAA is willing to accept before taking contractual action for unsatisfactory IA performance; and
- The quality assurance methods and sources of data the FAA may use to evaluate the NWS's performance in meeting the performance measures specified.

Depending on the service evaluated and the evaluation method selected, an APL may be stated as a number of occurrences (e.g., number of dropped calls per month = 100) or as a percentage (e.g., percentage of urgent Sigmets issued after significant weather criteria is met). An APL of zero deficiencies/errors is appropriate if, in fact, any defect is unacceptable for IA requirements. The NWS is notified when performance is marginal or approaching an unacceptable APL.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00193 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

SECTION 3: ROLES & RESPONSIBILITIES OF THE FAA, NWS, AND USERS

3.1 Overview of Key Roles and Responsibilities

The FAA is responsible for ensuring the NWS fulfills the obligations of this IA and meets established performance measures within the PRS. The NWS is responsible for meeting IA requirements and performance measures within the PRS through the implementation of internal quality control processes. Traffic Management supports the quality control process by indicating their satisfaction level through formal and informal feedback. These key roles are described further below.

3.2 FAA Responsibility

The Contracting Officer (CO), Contracting Officer Technical Representative (COTR), and Quality Assurance Evaluator (QAE) represent the key FAA personnel responsible for quality assurance and IA compliance oversight as described within this document. All communications regarding questions or issues related to quality assurance and inspection are directed to the CO or COTR. Specific duties will mature as the FAA further refines the process for CWSU quality assurance.

3.2.1 Contracting Officer

The CO has the authority to administer the IA including oversight of the quality assurance process. The CO may delegate many of the day-to-day quality assurance duties to the COTR and QAEs. However, certain contractual actions such as negotiation and issuance of IA modifications, resolution of NWS claims and disputes, issuance of deficiency notices such as NWS Deficiency Reports (NWSDR), issuance of show-cause letters, termination of the IA, and IA close-out, are retained by the CO.

The CO relies on functional experts and QAEs to provide information and recommendations regarding the quality of the NWS work performed. The CO is responsible for enforcing the completion of all requirements of the IA To meet this objective, the CO determines the resources required for quality assurance inspections, reporting, and evaluation.

3.2.2 Contracting Officer's Technical Representative

The COTR may serve as the day-to-day manager of one, several, or all requirements of this IA including monitoring IA compliance and NWS performance as related to the PRS. The COTR, with CO approval, is responsible for:

- Representing the CO and serving as the NWS's point of contact;
- Determining if the work being performed fulfills the needs of customers in accordance with IA; specifications and conforms with acceptable performance levels within the PRS; and
- Supervising the QAEs and ensuring that they properly conduct the QA

The COTR must inform the NWS of any performance-related problems and recommend actions that should be taken. The COTR will also coordinate with the NWS and the CO on the terms of the IA, including contractual elements related to performance.

3.2.3 Quality Assurance Evaluators

QAEs play a key role in IA administration. The FAA monitors CWSU performance through the services of QAEs. The QAEs perform the actual IA surveillance and report to the COTR. Some of the key IA administration duties of QAEs include the following:

- Conduct surveillance as required by the PRS and make recommendations to the COTR for deficiency notices and/or letters of commendation;
- Assist the COTR in identifying necessary changes to the contract, conducting quality assurance meetings, approving submittals, and maintaining work files;
- Make recommendations to the COTR for the validation of satisfactorily completed work and for administrative actions based on unsatisfactory work and non-performed work;
- Furnish the COTR with any requests for changes, deviations or waivers to the IA; and
- Serve as subject matter experts as requested by Board of Performance and Cost Review (BPCR) as described in Section 3.2.4.

QAEs possess no authority to allow the NWS to deviate from IA requirements. The QAEs also have no authority to direct or interfere with the methods of performance by the NWS or to issue modifications directly to any of the NWS's personnel unless methods being used are unsafe. During the surveillance process, QAEs identify whether problems and issues identified are local in nature (e.g., facility or employee) or systemic. QAEs convey their determination to the CO and the COTR for follow-up action.

3.2.4 CWSU Board of Performance and Cost Review

The Board of Performance and Cost Review (BPCR) will be made up of both NWS and FAA representatives. The BPCR provides an opportunity for the FAA and the NWS to exchange information regarding the impact of proposed changes on the quality of CWSU services, including changes to the QASP. In this role, the BPCR may address concerns regarding systemic performance issues elevated to their attention. The NWS may also discuss discrepancies in the surveillance conducted or data collected by the FAA.

This forum also provides an opportunity to review NWS performance in conjunction with other CWSU services stakeholders including user and/or customer groups. The FAA may request participation from other FAA entities such as the Office of Operations Planning (ATO-P). At the FAA's discretion, the BPCR may address other matters relating to the quality of services produced by the NWS as a means of monitoring performance. The composition of the Board may include representatives from other program offices within the FAA impacted by the CWSU operational environment.

3.3 NWS Responsibility

The NWS is responsible for meeting all requirements in the IA and APLs in the PRS. In addition, the NWS is responsible for implementing a Quality Management Plan (QMP) submitted to and approved by the FAA. The NWS is responsible for producing, maintaining, and providing all management records and reports associated with surveillance of IA requirements. The NWS's QMP identifies specific roles and responsibilities within the NWS organization to incorporate aspects of quality assurance and quality control necessary to meet requirements of this contract.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00195 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

3.4 Customer Support

Customers are the diverse members of the aviation community including pilots, domestic and international aviation interests; federal, state, and local. Customers indirectly support the QAEs and COTR in conducting quality assurance by providing information on NWS performance through customer satisfaction surveys, customer complaints process, and other feedback mechanisms. As noted earlier, the FAA may rely upon customer representation to supplement topics discussed at the BPCR.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00196 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

SECTION 4: QUALITY ASSURANCE EXECUTION STRATEGY

4.1 Periods of Performance

Quality assurance is structured to address the performance periods identified in the IA. Performance expectations during each period differ; therefore, quality assurance strategies for CWSU services used by the FAA to monitor and evaluate NWS performance may vary. Where a historical performance baseline does not exist, the FAA may establish the duration of time for establishing an APL. Similarly, the FAA may consider the period of performance when assessing IA compliance with specific IA requirements. The FAA will update the QASP accordingly.

4.1.1 Phase-In Period

During Phase-In, the NWS prepares to assume full responsibility for all areas of the new operation based upon the NWS proposal, the requirements outlined in the IA and the performance objectives established in the PRS. Surveillance during the Phase-In Period focuses on the NWS's ability to meet requirements, in a manner consistent with its Transition Plan.

4.1.2 Transition Period

During the Transition Period, the FAA monitors compliance with the IA as well as those requirements in the PRS with established APLs. Different sets of performance measures and APLs provided by the NWS in their proposal will be incorporated in the PRS during the Transition Period.

4.1.3 End-State Period

During this period, information gathered during the Transition Period may impact APLs defined in the PRS and as such, APLs may be adjusted to more accurately reflect current levels of performance or methods of service delivery. Additionally, the FAA, in consultation with NWS, may modify other aspects of the PRS as necessary to reflect changes in operations and to better evaluate NWS performance based on updated systems, procedures, and performance criteria.

4.2 Quality Assurance Evaluator Schedule

Upon the start of the Phase-In Period, QAEs establish and execute a schedule of surveillance based on the PRS and IA compliance surveillance requirements. Following an initial evaluation period, the FAA modifies the schedule based on NWS performance results. Additionally, the surveillance schedule may change at any time at the discretion of the CO or COTR or if any indications of diminishing service quality are apparent or when factors likely to impact performance, such as heightened security alerts and workforce upheavals, are present or anticipated.

4.3 Surveillance Methods

The FAA employs various surveillance methods including inspections, surveying, direct observations, and document review. These methods are used interchangeably, based on the nature of the contractual requirement or performance measure, in order to adequately evaluate NWS performance. The FAA's surveillance determines if the NWS is compliant with the contractual requirements stated in the IA and is meeting performance levels presented in the PRS. The PRS identifies the surveillance method, evaluation frequency, and data source for performance measures. For IA compliance, the CO and COTR determine the most appropriate surveillance method for evaluating NWS compliance with specific IA requirements.

4.3.1 Inspections

This method is designed to evaluate part or all of a set of products and services through careful investigation. Results of inspections must be clearly documented using a reporting tool. This approach is recommended for critical requirements and performance measures.

Examples of performance measures or IA requirements that could be monitored through inspections include:

- Training Compliance
- Response to Request for On-Demand Service
- Application of Customized Meteorological Service Provision

4.3.1.1 100 Percent Inspection

This method evaluates all products and services of the IA requirements (i.e., one-to-one ratio of output to inspection). This is most applicable to small quantity, important products and services. These inspections are used for requirements that are critical or where there is some reason for suspecting that the performance standard is not being met and therefore should be more closely monitored. One hundred percent inspection is also used for monitoring scheduled IA requirements including one-time deliverables and scheduled submissions.

4.3.1.2 Planned Inspection

This method uses a comprehensive evaluation of selected products and services on a scheduled basis (e.g., monthly or quarterly). The FAA notifies the NWS of the schedule and objectives for each set of evaluations prior to actual inspections. With this type of evaluation, the NWS knows that work performed in specific activities or selected locations is more likely to be monitored than work in other areas or locations. As an example, the FAA could assess NWS compliance with the dissemination of the aviation weather forecasts. In this situation, the FAA is more likely to focus the inspection on critical facets of information disseminated that is useful for traffic management planning.

4.3.1.3 Unplanned Inspection

This method uses a comprehensive evaluation of selected products and services on an unscheduled basis. The FAA may elect not to notify the NWS of the schedule and objectives for each set of evaluations prior to actual inspections. With this type of evaluation, the NWS may be unaware what work performed in specific activities or selected locations are likely to be monitored. As an example, QAEs could assess NWS compliance with on-demand services required by the FAA.

This method entails gathering a sample of data or opinions considered to be representative of a whole population or set of results in a systematic manner. Based on a series of related subjective measures, the survey results are tabulated with each measure weighted based on criticality. The survey may be used to evaluate a particular service such as advisory services or the opinion of a set of stakeholders such as customers. The survey results may be assessed on an individual basis or as an aggregate across facilities and services. The FAA notifies the NWS of survey scoring criteria and weighting in advance of implementing this surveillance method.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00198 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

As an example, the FAA could issue a customer satisfaction survey to a variety of customers gauging customer satisfaction with the quality, timeliness, accuracy, customer service, and relevance of overall and specific services received. This survey could include customers that interact with one or several CWSU offices. Results could be tabulated and assessed by office, across all offices, or in both manners.

4.3.2 Direct Observation

This method uses direct observation of CWSU services performed to enforce compliance with IA requirements. Observations can be performed periodically or through 100% surveillance. Observation activities include over-the-shoulder monitoring and conducting time and motion studies. For example, the FAA could elect to use direct observations to measure NWS conformity with the performance measure, "time to respond to request for on-demand service," within the PRS. Observations are documented in a log or checklist/evaluation form to capture performance levels for the monitored criteria. In the case of monitoring performance of CWSU services, evaluation forms record NWS performance against predetermined criteria published in the PRS and IA whenever possible.

4.3.3 Document Review

This method is designed to evaluate reports and records generated by the NWS or the FAA, or other FAA agencies. This approach is effective when the data required to evaluate NWS performance is provided on a routine basis in a standard format. The reports may be based on one or more surveillance methods.

4.4 Other Techniques

QAEs typically rely on a variety of techniques to assess a section of products or services and gauge the overall quality of all NWS products and services. These techniques can be applied to most of the surveillance methods discussed above. Two techniques commonly used by the QAEs in the implementation of this QASP are described below.

4.4.1 Random Sampling

This technique is appropriate for evaluating IA compliance or performance results when each occurrence of an activity has an equal and known chance of being selected or performed. This technique is recommended for large quantity, repetitive activities. It can be applied on a periodic basis when a deficiency is suspected.

It is important that the products or services selected be representative of the population, and not biased in a systematic manner. For example, selecting products and services in a particular flight plan area with non-varying weather may require less complicated CWSU services than a region that is subject to varying fog, volcanic ash, or mountain wave turbulence. Since the FAA considers the performance of the whole population of products or services based on the inspection of the sample, these types of products and services should not be under or over represented.

4.4.2 Scenario Testing

This technique is appropriate to gauge the NWS's ability to provide CWSU services based on differing customer requirements and situations. The FAA evaluates NWS performance on a random basis by contacting NWS employees through the use of defined customer situations or scripts to evaluate NWS performance. This process uses pre-established aviation weather forecast data and compares information that is submitted by the CWSU in collaboration with the usual traffic management staff.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00199 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

4.5 Reporting Tools

Managing the diversity of performance information is crucial to an objective evaluation process. The FAA uses the following tools to record and report performance results. Other tools may be developed as performance measures and areas of surveillance are added or adjusted.

4.5.1 NWS Deficiency Report

This report included in Appendix B is a sample form for documenting unsatisfactory NWS performance. It also allows the NWS to address concerns about performance issues and to offer solutions and timelines for resolution of performance issues. This sample report establishes an audit trail from identification of a deficiency to remediation actions required to issue resolution.

4.5.2 Sampling Guide/Inspection Checklist

QAEs use the sampling guide/inspection checklist, a sample of which is included in Appendix C for identifying each IA requirement to be inspected. QAEs then complete the document during an inspection. The sampling guide shows the specific tasks to be inspected and whether the inspection is passed. QAEs write specific comments on the bottom of the sampling guide. The CO may use the guide to bring defects to the NWS's attention. All instances of unacceptable performance detected require NWS initials on the original sampling guide, indicating notification of the problem.

4.6 Performance Results

The FAA assesses performance of the NWS based on the NWS's ability to comply with the requirements of the IA and meet defined performance criteria established in the PRS. Performance is monitored measure-by-measure and requirement-by-requirement through the collection of data pertaining to the IA, PRS and CDRLs.

4.6.1 Satisfactory Performance

Satisfactory performance indicates the NWS is meeting IA requirements, or the NWS is meeting or exceeding stated APLs. When the NWS's performance is satisfactory, the number of deficiencies does not exceed the allotted acceptable thresholds identified in the evaluation criteria. Although the NWS's performance may be deemed satisfactory, the QAE may suggest to the COTR that an increased level of surveillance be used for services supporting safe and efficient flight that show defect rates approaching the minimum APL.

4.6.2 Unsatisfactory Performance

Unsatisfactory performance indicates the NWS is either not meeting IA requirements, or not meeting stated APLs. When the NWS's performance is unsatisfactory, the number of deficiencies exceeds the allotted acceptable thresholds identified in the evaluation criteria. The FAA's QASP facilitates the determination of quality deficiencies under a IA arrangement. The FAA's primary concern is with the products and services provided by the NWS and not with the procedures used to produce them. However, if the delivery of any required product or service is determined to be unsatisfactory, NWS procedures may also be reviewed to identify sources of performance deficiency.

4.6.3 Documenting Unsatisfactory Performance

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00200 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Thorough documentation of unperformed or poorly performed work is essential. The QAEs, as trained inspectors, document poor performance by compiling facts during their inspections and evaluations conveying this information in their surveillance results. The COTR then develops documentation to substantiate nonconformance with the performance requirements. The documentation, together with any recommendations, is forwarded to the CO.

4.7 Reports

4.7.1 Site Inspection Reports

Within 15 days of a site inspection, a report is prepared by the Team Lead and submitted to the Quality Assurance Manager. The purpose of the report is to provide the FAA with a general overview of the office inspected including significant observations, issues and problems encountered. The report documents items of concern that would not be captured in the performance measurement data. Also contained within the report are accolades and information regarding the CWSU personnel that rendered assistance and the time required to provide support.

4.7.2 Performance Measure Statistical Reports

A performance measure statistical report is generated for reporting to the BPCR. The report may cover what has been completed for that current quarter and forecast what the PM may look like at the end of the quarter. The reports normally have graphs and narratives with discussion points addressing specific issues and comments including historical data.

4.7.3 Trend Analysis Reports

This analysis report can be of one PM, a group of PMs, or the overall service. It is a time based analysis, indicating the need for historical data. Each trend analysis report is tailored to the needs of the requestor. After use, it is normally stored on a secured website to be viewed by all authorized personnel. A trend analysis report will normally contain graphs, a narrative with in-depth analysis, and an executive summary. The report may include what the analyst considers to be the implications of the trend (especially if the trend shows or implies a deterioration of services). The report may also include suggestions and ideas that could be discussed to stem, correct, change the direction, or lessen the impact of the trend.

4.7.4 Reporting Beyond the Performance Measures

This report is prepared by request. It covers a range of topics that are part of the contract but not measured for performance purposes nor routinely reported as a necessary deliverable under any CDRL. The scope of this report is very broad and consolidates observations by FAA and NWS stakeholders. The report encompasses a big picture of the delivery of service, performance measurement, and customer feedback. It may emphasize strategic issues, needs, and directions that may be evaluated by stakeholders of CWSU services. Historical data can be used to emphasize or de-emphasize trends or points.

4.7.5 Deficiency Reports

Unsatisfactory performance is continuously documented and analyzed for local or systemic problems and concerns. If the unsatisfactory performance continues, the QAE may recommend that the QA Manager submit a *NWS IA Deficiency Report* to the CO. Upon receipt of a deficiency report, the CO may require the NWS to take necessary action to ensure that performance conforms to IA requirements. The CO may refer systemic issues to the BCPR for further discussion.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00201 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

SECTION 5: SURVEILLANCE ADJUSTMENTS

As described below, the level of surveillance may be adjusted based upon the performance of the NWS or changes in the operational environment.

5.1 Satisfactory Performance

Continuous satisfactory performance by the NWS may allow the COTR and the QAE to consider maintaining the current level of surveillance. However, the QAE may periodically change the evaluation frequency, lot size, surveillance method, and surveillance technique to assess different facets of IA requirements or PRS performance measures. The actual modifications would be based upon the judgment of the QAE and COTR. The change should always be staged over time to measure the tendency of how the NWS performs in an environment of modified surveillance. A demonstration of satisfactory performance at each state of modified surveillance will allow the CO to determine an appropriate modified surveillance level.

5.2 Unsatisfactory Performance

If the delivery of any required product or service is determined to be unsatisfactory, NWS procedures may also be reviewed to identify sources of performance deficiency. Unsatisfactory performance by the NWS may prompt the COTR and the QAE to increase the level of surveillance. The lot size, frequency of evaluation, surveillance method, and surveillance technique may be modified to apply greater scrutiny on the day-to-day performance of the NWS. Regardless of the cause or source, the NWS is held responsible for all identified deficiencies.

Normal surveillance levels should be resumed whenever performance improves to the point acceptable to the COTR. Normal inspection should be resumed in a staged manner over a period of time. The COTR needs adequate time to verify the improvement of NWS, performance will continue even through reduction in surveillance levels.

5.3 Changes to Operational Environment

Anticipation or occurrence of a significant change in the operational environment due to heightened national security, infrastructure modifications, personnel reduction or transfer, newly introduced NWS procedures or processes, or other activities disrupting the status quo, may require the FAA to increase the level of surveillance. QAEs may consider change to the evaluation frequency, lot size, or surveillance technique to better gauge NWS performance throughout the change in operational environmental. Any reduction in surveillance should be gradual and staged over time to measure how the NWS performs in an environment of reduced surveillance. Excellent performance at each state of reduced surveillance will allow the CO to approve lower surveillance levels.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00202 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

APPENDIX A: PERFORMANCE REQUIREMENTS SUMMARY

The following table presents the PRS, which identifies key performance measures for quality and timeliness by the IA reference number.

Technical Exhibit # D-1: Draft Performance Requirements Summary

The columns are defined as follows:

Performance Measure - Indicates the outcome by which the agency will monitor SP performance.

Performance Measure Definition - Provides a description and context for which the performance measure will be calculated.

Applicable Services - Indicates the services to be evaluated using the stated performance measure.

Acceptable Performance Level (APL) - Indicates the performance level that is acceptable by the Government for a given performance measure.

Evaluation Frequency - Indicates standard period when performance will be evaluated adjustable at the discretion of the Government.

Data Source - Indicates the primary source of information that will be used to evaluate performance.

Surveillance Method - Indicates the primary technique for monitoring and evaluating performance.

Primary Metrics

ID	Performance Measure	Performance Measure Definition	Applicable Services	Acceptable Performance Level (APL)	Evaluation Frequency	Data Source	Surveillance Method
1	**CWSU Customer Satisfaction Index**	The resulting index rating is based on a series of questions gauging customer satisfaction with quality, timeliness, accuracy, customer service, number of validated complaints of the CWSU services received.	Aggregate, By Service	>85 %	Quarterly	TMU survey sample	Document Review
2	**Service Delivery Conformity Index Score**	The resulting score based on a standard evaluation process whereby ratings in the provision of both standardized and customized services equate to a conformity index score for aviation weather services for each facility evaluated.	Aggregate	> 84 %	Periodic	FAA Traffic Management Web-based evaluation form	TMU data entry and document review
3	**Time to Respond to Request for On-demand Service**	The sum of requests per week directed at the CWSU and answered within a specific time designated divided by total requests received per week.	Aggregate	Time Oriented	Quarterly	Telecommunication Records	Document Review
4	**Accuracy of Forecast**	The direct correlation of forecast generated by the CWSU, weather events that actually occurred, and actions taken by the TMU based upon the meteorological services provided.	Aggregate	NWS to propose APL	Quarterly	NWS to propose data source and analysis methods for approval by FAA	Document Review
5	**Number of Aircraft Incidents Attributed to Inaccurate Aviation Weather Forecasts**	The sum of all year-to-date aircraft incidents attributed to inaccurate aviation weather forecasts.	Aggregate	<1%	Upon occurrence of aircraft incident	ATO Safety Statistics	Document Review

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00203 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

A.1 Performance Measures

A.1.1 Performance Measure #1: CWSU Customer Satisfaction Index

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
CWSU Customer Satisfaction Rating	The resulting index rating is based on a series of questions gauging customer satisfaction with quality, timeliness, accuracy, customer service, number of validated complaints of the CWSU services received.	>85%	TMU survey sample	Document review

A.1.1.1 Data Source Description

The customer satisfaction rating will be based upon TMU responses to CWSU services in a questionnaire, developed by the FAA, containing the following customer service indicators:

- Quality
- Timeliness
- Accuracy
- Customer Service
- Number of validated complaints

A.1.1.2 Primary Surveillance Method(s)

Customer Satisfaction Survey Review	
Frequency:	Quarterly
Actions:	Administration of a customer service questionnaire

A.1.2 Performance Measure #2: Service Delivery Conformity Index Score

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Service Delivery Conformity Index Score	The resulting score based on a standard evaluation process whereby ratings in the provision of both standardized and customized services equate to a conformity index score for aviation weather services for each facility evaluated. Note: Checklist of standardized and customized local weather services will be used to determine score.	>84%	FAA Traffic Management web-based evaluation form	TMU data entry and document review

A.1.2.1 Data Source Description

A web-based evaluation form will be made available to Traffic Management Coordinators that indicates the items that should be included in daily briefings and products.

A.1.2.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	The web-based evaluation form will include a list of briefings and meteorological products and services. The items should be those covered in 7210.38A, as well as those specific to individual facility needs such as the San Francisco marine stratus forecast.

A.1.3 Performance Measure #3: Time to Respond to Request for On-demand Service

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Time to Respond to Request for On-demand Service	The sum of requests per week directed at the CWSU and answered within a designated time divided by total requests received per week.	Time oriented	Telecommunications records	Document review

A.1.3.1 Data Source Description

A telecommunications record keeping system must be in place to record requests made by the TMU directed at the CWSU for meteorological forecasting services.

A.1.3.2 Primary Surveillance Method(s)

Frequency:	Quarterly
Actions:	Record review by Quality Assurance Evaluator

A.1.4 Performance Measure #4: Accuracy of Forecast

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Accuracy of Forecast	The measure of the correlation of forecasts generated by the CWSU, weather events that actually occurred, and actions taken by the TMU based upon the meteorological services provided.	NWS to propose APL	Quarterly	Document review

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00205 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

A.1.4.1 Data Source Description

An evaluation mechanism should be put in place where CWSU services and products will be analyzed for meteorological accuracy after the occurrence of weather. This will require that CWSU services and products are recorded using a method determined by the CWSU. The recorded information will later be compared by the NWS with actual weather occurrences and Traffic Management Initiatives for forecast accuracy.

Frequency:	Quarterly
Actions:	Subject matter expert analysis of recorded data

A.1.5 Performance Measure #5: Number of Aircraft Incidents Attributed to Inaccurate Aviation Weather Forecasts

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Number of Aircraft Incidents Attributed to Inaccurate Aviation Weather Forecasts	The sum of all year-to-date aircraft incidents attributed to inaccurate aviation weather forecasts	< 1%	ATO Safety Statistics	Document Review

A.1.5.1 Data Source Description

ATO Safety keeps track of aircraft incidents and can be leveraged to determine meteorological support forecasts in comparison to flight plans.

A.1.5.2 Primary Surveillance Method(s)

Analysis of ATO safety findings

Frequency:	Upon occurrence of an aircraft incident
Actions:	Investigation of occurrence to determine accuracy of forecasts

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00206 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

APPENDIX B: CWSU DEFICIENCY REPORT

1. CONTRACT NUMBER DEFICIENCY REPORT NUMBER:
2. TO: (CWSU LOCATION & MANAGER'S NAME) 3. FROM: (NAME OF COTR)
DATES 4. PREPARED - ORAL NOTIFICATION - RETURNED BY CWSU LOCATION - ACTION COMPLETE
5. DEFICIENCY OR PROBLEM (DESCRIBE IN DETAIL. INCLUDE REQUIREMENTS DOCUMENT REFERENCES. ATTACH CONTINUATION SHEET IF NECESSARY):
6. SIGNATURE OF QAE:
7. TO: (CONTRACTING OFFICER) FROM (CWSU)
8. CWSU RESPONSE AS TO CLAUSE, CORRECTIVE ACTION AND ACTIONS TO PREVENT RECURRENCE (ATTACH CONTINUATION SHEET IF NECESSARY. CITE APPLICABLE QUALITY CONTROL PROGRAM PROCEDURES OR NEW QUALITY CONTROL PROCEDURES):
9. SIGNATURE OF CWSU REPRESENTATIVE: DATE:

10. FAA EVALUATION (ACCEPTANCE, PARTIAL ACCEPTANCE, REJECTION. ATTACH CONTINUATION SHEET IF NECESSARY):
11. FAA ACTIONS (CWSU DEFICIENCY REPORT, CURE NOTICE, SHOW CAUSE, OTHER):

CLOSE OUT			
NAME:	TITLE	SIGNATURE	DATE
CWSU NOTIFIED:			
QAE:			
COTR:			

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00208 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

APPENDIX C: SAMPLING GUIDE/INSPECTION CHECKLIST

SERVICE CATEGORY
Center Weather Services Unit, Products

NOTE: **S** = Satisfactory Performance **U** = Unsatisfactory Performance **N/A** = Not Applicable

1	**Method of Surveillance:**			
2	**Lot Size:**			
3	**Sample Size:**			
4	**Performance Requirement:** Performance is satisfactory (S) when ____ or fewer deficiencies are discovered per month. Performance is unsatisfactory (U) when ____ or more deficiencies are discovered per month.			
5	**Sampling Procedure:** Instructions on how to select the sample must be clear and complete			
6	**Inspection Procedure:** The procedure must be detailed enough to allow a yes/no objective decision as to the acceptability of performance by anyone making the inspection. Explain when evaluation is to occur and what is acceptable/unacceptable			
		Performance: Satisfactory (S), Unsatisfactory (U), Not Applicable (N/A)		
	PRS Requirements	**Timeliness**	**Quality of Work**	**Notes**
	Overall Rating Of Inspection (S, U, or N/A)			

Inspector Comments: ______________________________

CWSU Signature: ____________________ **Date:** ____________________

QAE Signature: ____________________ **Date:** ____________________

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00209 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

#7

12/29/2008 16:19 7039044467 PAGE 01/01

U.S. Department of Transportation
Federal Aviation Administration

September 24, 2008

Dr. John Hayes
Assistant Administrator of Weather Services
National Oceanic and Atmospheric Administration
1325 East-West Highway
Silver Spring, MD 20910

Dear Dr. Hayes:

This letter is in response to the three business models the National Weather Services submitted to the FAA on May 9, 2008 regarding the Center Weather Service Unit (CWSU) Requirements Document.

Our agency conducted a thorough review of your proposals for each business model. While there are elements of each proposal that have merit, for example, the Collaborated Weather Impact Product which provides the product consistency we are looking for, the cost of each model is too high. We cannot accept any of the three as proposed.

The FAA does not require direct, face-to-face contact at each of our Air Route Traffic Control Centers. Technology has advanced over the past decade to allow us to move away from that most costly option. Of the three business models you proposed, we would prefer to move towards a Single Weather Center. However, we understand the need for a "Hot" back-up and support that approach.

We request a proposal be delivered no later than Tuesday, December 23, 2008 to allow us to make a final decision and move forward with our future plans for weather support to the FAA. Thank you for your willingness to listen and work with us as we move forward into the next generation of America's aviation system.

Sincerely,

Nancy B. Kalinowski

Nancy B. Kalinowski
Vice President, System Operation Services
Air Traffic Organization

#8

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

JUN - 3 2009

Mr. Eugene D. Juba
Senior Vice President for Finance Services
Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591

Dear Mr. Juba:

Enclosed is the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) revised response to the Federal Aviation Administration's (FAA) Center Weather Service Unit (CWSU) requirements. Our original response, submitted in May 2008, contained three potential CWSU services models as requested in the January 2008 FAA Requirements Document. This revised response is the result of subsequent dialog between the FAA and NWS, which led to a refinement of the original FAA requirements as articulated in Nancy Kalinowski's letter to me dated September 24, 2008.

Our response includes a CWSU services model that continues to leverage other NOAA capabilities and infrastructure supporting aviation weather. These include collecting and processing billions of weather observations, generating global and regional numerical weather prediction guidance, and producing and providing aviation weather products and services by the Aviation Weather Center and Weather Forecast Offices every day.

Per your request, the response contains a plan to consolidate services currently provided by 20 Contiguous United States (CONUS) CWSUs to two CONUS CWSUs, contingent on a successful demonstration and validation (Dem/Val) of the two-center model. It includes elements that will improve NWS products and services in areas you identified as important to aviation traffic management. Our response calls for an independent team to guide the Dem/Val to ensure objectivity and to evaluate the quality of service NOAA provides to the FAA and its impact on public safety.

The response also includes increased management oversight as part of a performance-based service and improved collaboration among the NWS Aviation Services Team and the FAA's System Command Center. Our improved CWSU services will also enhance the quality and consistency of aviation weather support products as the CWSU program evolves into the NextGen era. Although our response follows FAA guidance to avoid tightly linking the CWSU transition schedule to NextGen Initial Operating Capability, we continue to recommend some linkage since the specific role of the CWSUs during NextGen operations is unknown.

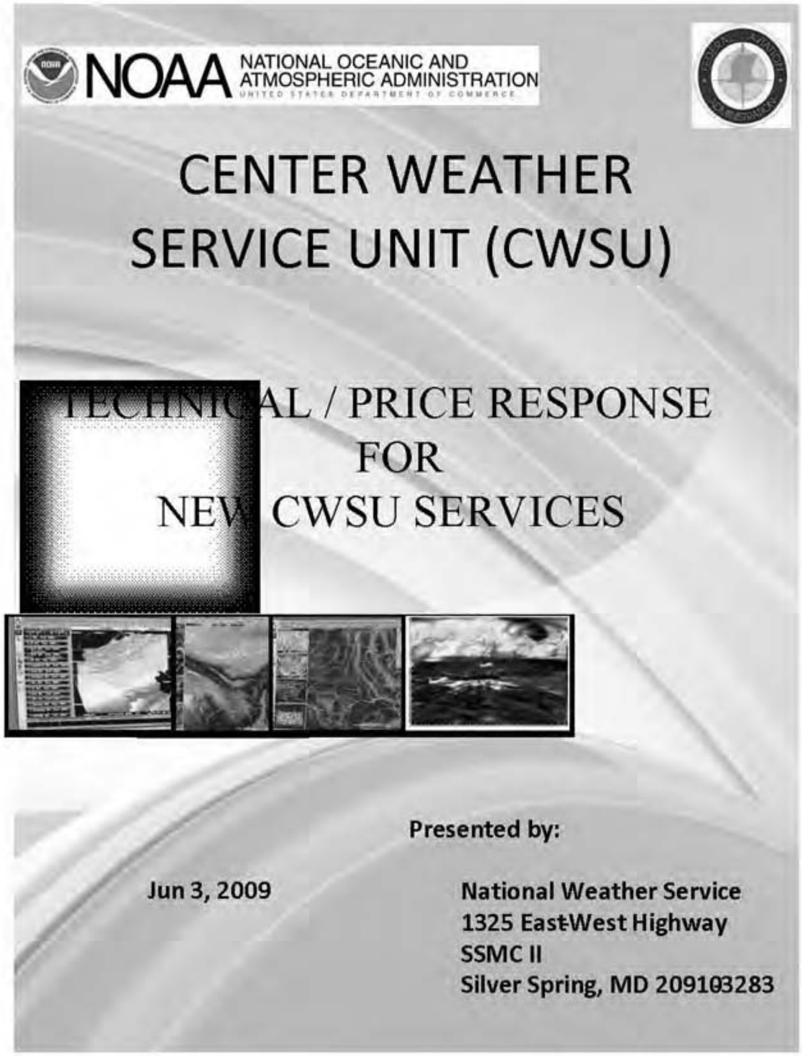
This response to the FAA's requirements reflects an NWS commitment to improve the technology and service delivery methods used to meet the FAA's weather needs for air-traffic management today and into the future. I look forward to strengthening the partnership between our agencies to improve the way aviation weather information is delivered and used.

Sincerely,

John L. Hayes

THE ASSISTANT ADMINISTRATOR
FOR WEATHER SERVICES

#9



NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

CENTER WEATHER SERVICE UNIT (CWSU)

TECHNICAL / PRICE RESPONSE FOR NEW CWSU SERVICES

Presented by:

Jun 3, 2009

National Weather Service
1325 EastWest Highway
SSMC II
Silver Spring, MD 209103283

Table of Contents

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00213 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

List of Figures

List of Acronyms and Abbreviations

ADDS	Aviation Digital Data Service
AIRMET	Airman's Meteorological Information
ALO	Aviation Liaison Officer
APL	Acceptable Performance Levels
ARTCC	Air Route Traffic Control Center
ASD	Aircraft Situation Display
ASDI	Aircraft Situation Display Information
AST	Aviation Services Team
ATCSCC	Air Traffic Control System Command Center
ATCT	Air Traffic Control Tower
AWC	Aviation Weather Center
AWIPS	Advanced Weather Interactive Processing System
AWIPSII	Advanced Weather Information Processing System II
BPCR	Board of Performance and Cost Review
CAWS	Consolidated Aviation Web Services
CBT	Computer Based Training
CCFP	Collaborative Convective Forecast Product
CDRL	Contract Deliverable Requirements List
CIWS	Corridor Integrated Weather System
CONUS	Continental United States
COTS	Commercial off the Shelf
CWA	Center Weather Advisory
CWIP	Collaborative Weather Impact Product
CWSU	Central Weather Service Unit
Dem/Val	Demonstration/Validation
DFW	Dallas Ft. Worth
FAA	Federal Aviation Administration
FAQ	Frequently Asked Questions
FIP	Facilities Implementation Plan
FOC	Full Operational Capability
FTE	Full-Time Equivalent
FTI	Federal Telecommunications Infrastructure
GOTS	Government off the Shelf
GTG	Graphical Turbulence Guidance
HR	Human Resources
I&I	Impact and Implementation
IMS	Integrated Master Schedule
IOC	Initial Operating Capability

IT	Information Technology
ITWS	Integrated Terminal Weather System
JPDO	Joint Planning and Development Office
MAR	Modernization and Restructuring Effort
MIC	Meteorologist in Charge
MOS	Model Output Statistics
NAS	National Airspace System
NAWIPS	National Center AWIPS
NCEP	National Centers for Environmental Prediction
NDFD	National Digital Forecast Database
NextGen	Next Generation Air Traffic System
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OCP	Operational Change Proposal
PIREP	Pilot Report
POC	Point of Contact
PRS	Performance Requirements Summary
QA	Quality Assurance
QAM	Quality Assurance Manager
QASP	Quality Assurance Surveillance Plan
QICP	Qualified Internet Communications
QMP	Quality Management Plan
QP	Quality Program
RD	Requirements Document
SAS	Single Authoritative Source
SIGMET	Significant Meteorological Information
SME	Subject Matter Expert
SOA	Service Oriented Architecture
TAF	Terminal Aerodrome Forecast
TM	Transition Manager
TMU	Traffic Management Unit
TRACON	Terminal Radar Approach Control
VOR	VHF Omnidirectional Range
WARP	Weather and Radar Processor
WBS	Work Breakdown Structure
WBT	Web Based Training
WFO	Weather Forecast Office

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00216 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Executive Summary

The National Weather Service (NWS) provides the Federal Aviation Administration (FAA) consistent, high-quality aviation weather products and services focused on weather impacts to the National Air Space (NAS) and is integrated into the NAS decision cycle. Based on our October 2008 meetings with FAA personnel, and the subsequent FAA letter received by the NWS, we have modified our previously submitted Remote Single Center Weather Service Unit (CWSU) business model. Our revised proposal for CWSU Services reflects our ongoing commitment to providing superior aviation products and services to respond to FAA requirements today and into the future.

The NWS proposes to focus resources to develop new forecasting products that further reduce weather-related risks and impacts to traffic flow, and to implement a new management structure and quality management program to ensure continued responsiveness to FAA needs. As part of our performance-based management approach, the NWS will continue to be accountable for providing accurate and consistent weather information to the FAA. This approach produces measurable results and continuous service improvements for both the FAA and the NWS through increased communication and feedback. **Figure ES-1** summarizes the key features of our proposed CWSU solution and the associated benefits to the FAA.

Figure ES-1: The FAA Benefits from the NWS's CWSU Services Model

Key Features of Our Revised Model	Benefits to the FAA
Demonstration / Validation (DemVal) of the new business model prior to actual deployment. The DemVal is a prerequisite to transitioning to the new model and must show no degradation of weather decision support services.	Demonstrates that the new model is robust and provides sufficient, timely weather for air traffic management; determined by independent evaluation, prior to implementation.
Continued consistent CWSU support for Air Route Traffic Control Centers (ARTCCs) through the Collaborative Weather Impact Product (CWIP), a new and improved weather product.	Common weather picture for all weather support stakeholders, ultimately contributing to timely, effective NAS decision making.
Consolidation of 20 CONUS CWSUs into 2 CWSUs, as requested: CWSU-North (College Park, MD) and CWSU-South (Kansas City, MO). Maintain CWSU-Anchorage (Alaska) as-is.	Hot backup sites (CWSU North and South) operate on a 24/7 basis with full continuity of operations. DemVal of ability of new technology to support this concept is essential.
Updated management structure provides a single Point of Contact (POC) both during the transition to the new model and upon implementation.	Single POC for continuous communication and proactive problem solving.
Introduce the CWIP, a traffic management decision tool.	Enables a common weather picture, which supports consistent traffic management decision-making.
Robust transition plan that takes into account the risks and mitigations inherent to a transition of this scope and magnitude, while ensuring NextGen linkage.	Minimizes transition risks to assure continuity of operations. Maximizes institutional knowledge available to the FAA immediately.

The attached proposal contains our operations model, management approach, and transition plan. We are eager to continue to strengthen our partnership with the FAA, and this proposal represents an FAA-NWS collaboration to maintain excellent aviation weather support.

1.0 Operational and Technical Support

The NWS's revised technical approach incorporates requirements as set forth in the FAA's Requirements Document (RD) to enhance current service and sets a path for weather support in the NextGen era, as supplemented by October discussions and FAA follow-on letter. Our performance-based services and Quality Assurance Surveillance Plan (QASP)[1] assure consistent products and services. Moreover, the performance-based nature of the services ensures that NWS remains accountable for product and service delivery. The NWS will collaborate with the FAA to continually enhance day-to-day weather support operations. Based on FAA requirements and a successful Demonstration/ Validation (DemVal) which demonstrates no degradation of services, we will centralize CWSU operations into two locations: **CWSU-South** at the Aviation Weather Center (AWC) in Kansas City, MO, and **CWSU-North** at the NCEP in College Park, MD. The **CWSU-Anchorage** at the ARTCC in Anchorage, AK will remain unchanged.[2] Forecast support for these locations will come from the various components of the Aviation Services Team (AST), described below. To address any real-time operational issues that require immediate action, the FAA will contact our Lead Forecaster on duty at the appropriate CONUS CWSU. Our operational concept for the CWSU Services is modeled after our successful Weather Forecast Office (WFO) structure. For any managerial or programmatic issues, the AWC Director will serve as the FAA's single point of contact (POC) for the entire CWSU program.

KEY FEATURES

- Establishing remote decision support and consultation to traffic management personnel.
- Establishing the CWP as the common weather picture across the CWSUs to enable situational awareness of NAS and weather.
- Establishing 24/7 CWSU services in two CWSUs: CWSU-North and CWSU-South.
- Conducting a DemVal with independent evaluation prior to the new business model assures no degradation of services.
- Establishing a performance-based service that produces measurable results for both the FAA and the NWS.

Our approach is contingent upon a successful Demonstration/Validation (DemVal), conducted over a 9-month period of stringent evaluation to capture seasonal weather scenarios. Our DemVal will be evaluated by independent groups, both Federal and commercial. In the final analysis, the DemVal must demonstrate that the new business model can be implemented with no degradation in service.

1.1 Operations Concept

The goal of CWSU services is to provide critical weather decision support to traffic management personnel to reduce the impact of weather on the safe and efficient flow of air traffic. To achieve this goal, and as part of the new operations concept, the NWS proposes products and services that include highly detailed, relevant weather information updated every 2 hours.

The CWSUs are an integral part of our AST, with the AWC, the Alaska Aviation Weather Unit, other National Centers for Environmental Prediction (NCEP), and WFOs completing the team. **Figure 1-1** depicts the AST and the role of each team member. In the NWS revised planning, the

[1] QASP and QMP provided as separate attachments.

[2] Per FAA guidance, the CWSU Anchorage will remain unchanged. The NWS has therefore not addressed any changes to the current Alaska support structure.

AST ensures consistency of services and products by using the CWIP, which is developed by and disseminated to all members of the AST.

Figure 1-1: Aviation Services Team (AST)

The AST will provide 24/7 coverage to the NAS through a combination of advisories, briefings, consultations, collaboration, oversight of forecast consistency, CWIP production, Terminal Area Forecasts (TAFs), and the National Digital Forecast Database (NDFD).

Key elements of the team operating approach will drive standardized services and products, while promoting consistency across national, regional, and local domains. These elements include:

- **CWIP:** The CWIP will be a collaborative hourly forecast out to 12 hours (updated every 2 hours) for convection, precipitation type and intensity, ceiling, winds, surface visibility, icing, and turbulence – depicted on multiple graphics. Members of the AST will collaborate with the FAA and private industry before issuing the products. Product issuance times will be synchronized with the 2-hourly FAA strategic planning process and to support the Strategic Planning Team telcons.
- **CWSU Web Portal:** CWSU-specific products, including the CWIP and Center Weather Advisory (CWA), as well as national, regional, and local weather briefings, will be available to the FAA and other users through direct access to the CWSU Web portal. Our proposed portal serves as a "one-stop shopping" approach, and offers users one-touch access to initiate instant messaging sessions or to request/initiate on-demand weather briefings. This portal will also serve as a library of documents related to status, Frequently Asked Questions (FAQs), and other management and interpersonal communications topics.
- **Interactive Online Collaboration Tools:** The FAA and the CWSU meteorologist will use state-of-the-art collaboration tools to ensure immediate remote access to one another.

These tools include an instant messaging feature and interactive online collaboration software used for on-demand briefings, consultations, and urgent problem solving. This software tool will allow two-way annotation of graphics, also known as "white-boarding."

1.2 Backup

The CONUS CWSUs, staffed on a 24/7 basis, will serve as each other's hot backup sites. The other AST components will also provide 24/7 support and continuity of service to the hot backup sites. Both CONUS CWSUs will have the capability to provide service backup.

1.3 Products

The NWS intends to enhance current CWSU aviation weather support. Using the best technology available, the NWS is developing a new suite of aviation-centric products and services that will integrate with existing ones to increase consistency, accuracy, and timeliness. This will contribute to the goal of reducing the impact of weather on the safe and efficient flow of air traffic. Contingent upon a successful DemVal, we will implement enhanced collaboration tools and processes across the AST, working toward a common weather picture available to the NAS and other aviation stakeholders.

1.3.1 CWIP

In today's aviation environment, it is critical to remain at the forefront of technology and innovation in day-to-day operations. With this in mind, the NWS is developing the CWIP – an enhanced weather product that incorporates the Collaborative Convective Forecast Product (CCFP) (thunderstorm predictions) and adds multiple new forecast elements to cover aviation weather-related impacts in a single forecast. The CWIP will be flexible, and will zoom from large-scale views (national picture) to multiple levels of granularity. Based upon a successful DemVal, the CWIP will serve as a common weather picture across the AST, offering consistent views and information. **Figures 1-2** and **1-3** depict our vision of the CWIP, which will meet the requirements set forth in the FAA's RD by Full Operational Capability (FOC).

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00220 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Figure 1-2: The CWIP Provides a Common Weather Picture

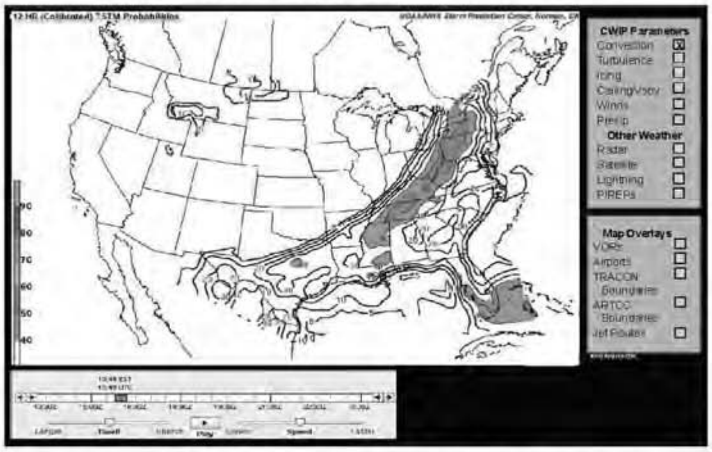
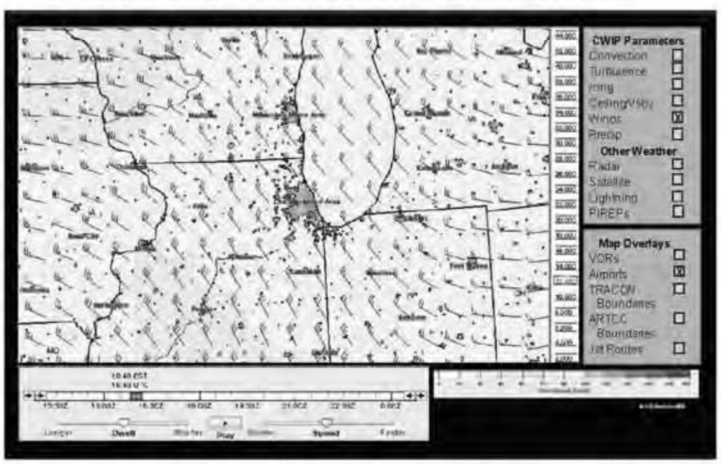


Figure 1-3: The CWIP Provides a Common Weather Picture



The NWS will coordinate with the FAA to access the Integrated Terminal Weather System (ITWS) and Corridor Integrated Weather System (CIWS) at the CWSUs. We will incorporate this information into the CWIP forecast as appropriate to ensure consistency. More detail on both ITWS and CIWS is available in Section 1.4.2.

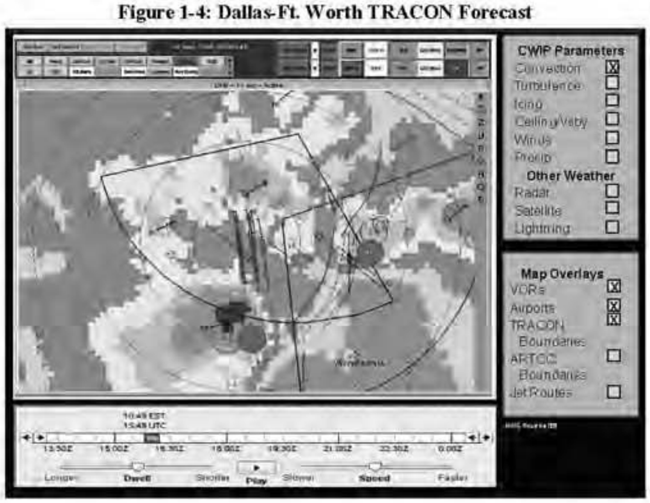
The proposed CWIP expands on the CCFP by increasing responsiveness to Weather Forecast Office input. The CWIP will provide digital hourly forecasts with animation capability, out to 12 hours. The forecast is updated every 2 hours (or more if needed), and issued 24 hours/day, year-round. As part of our approach, the NWS will increase the number of forecast products to include convection, precipitation type, precipitation intensity, ceiling, surface visibility, turbulence, icing, and winds. CWIP updates will coincide with the FAA's 2-hourly traffic management Strategic Planning Team telcons. CWSU forecasters will add narrative and annotation text boxes as needed to enhance user understanding and application for decision-making. Prior to forecast dissemination, members of the AST will collaborate with industry meteorologists and FAA traffic managers to build consensus.

1.3.1.1. TRACON Forecast

ARTCC-specific Terminal Radar Approach Control (TRACON) forecasts will be extracted from the CWIP and will comply with the 15 requirements specified in the FAA's original RD. An example of a TRACON forecast for convection (Dallas-Ft. Worth [DFW]) is provided in **Figure 1-4**. The DFW TRACON forecast has been in place for 6 years, and has proven to be a valuable product for operations.

These TRACON forecasts offer users the option of layering multiple CWIP parameters, such as precipitation, winds, or convection; and other weather parameters such as radar data or satellite imagery. In addition, the CWIP or TRACON views show air traffic management details such as ARTCC boundaries, jet routes, cornerposts, and VHF Omnidirectional Range (VOR) beacon.

Figure 1-4: Dallas-Ft. Worth TRACON Forecast



VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00222 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

The NWS continuously develops cutting-edge meteorological products and techniques. As part of our new business model, we intend to integrate these new technologies into our new products, improvements that meet multiple national needs. Our existing products will be integrated in the CWIP, resulting in a more consistent view for air traffic management decision-making.

Through a continuous feedback process during the DemVal (and subsequently by the Board of Performance and Cost Review [BPCR] process, detailed in the QASP) the NWS will work with the FAA to refine the CWIP and TRACON forecast product. We will align this product toward the NextGen goal of a Single Authoritative Source.

1.3.2 Remote Briefings

In accordance with the FAA's requirements document, the CWSUs will provide scheduled and on-demand briefings for the ATCSCC, ARTCCs, TRACONs, and ATCTs. To maintain top-quality weather briefings, the NWS will enhance the equipment and communications technology at the CWSUs, enabling forecasters to fully leverage the benefits of the CWIP. The CWIP ensures both a high level of situational awareness and consistency of information from the AST. Thus, forecasters can quickly generate the supporting graphics and improved weather analyses for comprehensive briefings. All of our FAA customers (ATCSCC, ARTCCs, TRACONs, and ATCTs) will receive CWSU briefings via remote briefing techniques. These new techniques will be thoroughly evaluated during the 9-month DemVal.

1.3.2.1. Scheduled Briefings

Because all FAA customers are offsite, recorded and scheduled briefings occur twice daily at the time of traffic management shift change and are updated as appropriate. Briefings consist of at least 12-hour forecasts of weather conditions expected to affect air traffic adversely across the NAS. These briefings contain information to enable Air Traffic Control and TMU managers to make sound decisions and appropriate operational adjustments as needed. We will make recorded briefings available to all facilities via our CWSU Web portal.

1.3.2.2. On-Demand Briefings

To support emergency operations and on-demand requests, the CWSUs will provide FAA air traffic management personnel with immediate, 24/7 remote support through interactive online collaboration, instant messaging, and standard voice telecommunications. The briefings will consist of concise tactical weather information required to assist NAS traffic managers. These briefings will be generated upon FAA/ARTC request, or when AST detects significant weather events that could impact aviation.

1.3.2.3. Center Weather Advisory

The NWS will continue to issue Center Weather Advisories up to 2 hours in advance for specific situations affecting air traffic. The CWA will be valid for up to 2 hours, and may include forecasts of conditions expected to begin within 2 hours of issuance. CWAs will be produced and disseminated using NAWIPS or another NWS-generated tool, updated as frequently as needed during active weather, and in compliance with the FAA's RD.

The CWSUs will capitalize on the planned technology upgrades that will enable forecasters to quickly generate the weather analysis necessary for enhanced short-term advisory services. The common weather picture derived from the CWIP will enable the CWSU meteorologists to have greater situational awareness. This will translate into better utilization of radar information, satellite images, pilot reports (PIREPS), and surface observations for issuing timely and accurate

CWAs. Ultimately, greater focus on weather impacts as a whole will enable CWSU meteorologists to remain proactive in the face of potentially dangerous weather conditions.

1.3.3 Ensuring Product Consistency

The NWS will achieve consistency by implementing enhanced collaboration in producing the CWIP. Since all members of the AST contribute to and receive the CWIP, all weather support personnel will have access to consistent information. Moreover, NWS personnel will capitalize on new network conferencing and communication technology to allow for collaboration by electronic chat, voice, and networked graphics. This technology is available to support both product consistency and the ability to resolve any meteorological inconsistencies. For example, if the CWIP identifies an area of low ceiling and visibility affecting a particular terminal and the current TAF forecast does not, the appropriate CWSU Lead Forecaster will coordinate with the relevant issuing offices to resolve the inconsistency.

The NWS has established a series of performance metrics designed to enhance and maintain product consistency, as described in our QASP. These metrics are designed to ensure service accountability and track forecast discrepancies, errors, and service quality. We will work collaboratively with the FAA to continually refine performance metrics, improve performance, and enhance products. As part of our 9-month DemVal, we will evaluate products to foster increased consistency.

1.4 Technical Infrastructure

The NWS has separated the technical infrastructure and technical requirements into two key components. The first is the communications capabilities needed so that NWS meteorologists and the FAA can communicate effectively. The second is the information and production systems needed for the NWS to produce, display, and disseminate CWSU-specific products to the FAA. With both components, the NWS will validate the scale and the specifications of the technical infrastructure required during the DemVal.

1.4.1 Two-way Operational Communication Capabilities

The FAA recommends leveraging communications technology so that weather operations become more in line with the services offered to the FAA's global partners. To address this, the NWS, in collaboration with the FAA, will develop alternate tools and the appropriate training to ensure consistent and continuous two-way communications. Any tools developed must be rigorously evaluated and proven during the DemVal.

Without a presence at each ARTCC, we believe that clear and effective communication between the NWS meteorologists and the FAA must involve communication delivery methods that maximize technologies. These technologies, which will follow stringent Federal IT security standards, will be selected jointly by the FAA and the NWS. Examples of these technologies include:

- **Voice Communication:** To accomplish voice communication, the NWS will use traditional telephone services. FAA users requiring support will call their respective CWSU.
- **Instant Messaging:** Instant messaging allows real-time text-based communication between the CWSUs and the FAA. Instant messaging is often preferred for quick questions and clarifications, as it allows for rapid responses without the overhead of a telephone interaction. Sophisticated instant messaging services will archive chat sessions

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00224 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

by region, date, type, and other parameters, and are highly recommended for this application. Both the FAA and NWS must agree to the use of instant messaging protocols and their security platforms.

- **Interactive Online Collaboration:** The NWS will use interactive online collaboration tools to deliver 24/7 on-demand briefings and other ad-hoc communications from the CWSUs to the FAA. Popular examples of similar technology include GoTo Meeting and WebEx. The web collaboration software used in this solution will include a sophisticated "white-boarding" capability to allow all parties in the collaboration session to annotate imagery on their screens. When combined with voice communication and instant messaging, this becomes a highly effective briefing tool. Some online collaboration applications currently combine both video and interactive collaboration, which can enhance two-way communication.
- **The CWSU Web Portal:** Provides a "one-stop-shopping" approach to all CWSU products, as well as easy access to vital communications systems for immediate two-way communications between the CWSU meteorologist and the FAA customers. At a minimum, the CWSU Web portal will provide the FAA user easy access to:
  - The CWIP application page, with the ability to overlay multiple layers and to "zoom" to regional or local areas of interest (e.g., TRACONs)
  - The latest recorded weather briefings
  - Instant messaging
  - On-demand weather briefings via web collaboration with voice communication
  - Individualized user configurations

In addition to the CWIP weather parameters, display capabilities within the CWSU Web portal will include information needed by traffic management, such as:

- Aircraft Situation Display Information (ASDI)
- Jet Routes
- Navigation Fixes
- Sector and ARTCC Boundaries
- Airport Identifiers
- TRACON specific information

Aspects of the CWSU Web portal will be modeled after the Aviation Digital Data Service (ADDS) portal (***http://adds.aviationweather.gov***). Currently, ADDS provides comprehensive pilot-friendly aviation weather graphics and data access. As in the development of ADDS, we will work closely with the CWSU Web portal users during the DemVal period to define the content and layout of the service in order to maximize user value to traffic management.

The NWS is developing an enterprise system—the Consolidated Aviation Web Services (CAWS)—to meet FAA's Qualified Internet Communications Provider (QICP) standards described in FAA Advisory Circular (AC) 00-62 for reliability, accessibility, and security of Internet communications for aviation weather. We will host the CWSU Web portal within this architecture. We require access to the FAA's Federal Telecommunications Infrastructure (FTI) network to securely and directly connect to this QICP architecture.

We intend to provide these technologies through successful integration into the FAA's FTI networks. For these tools to work, the FAA must ensure sufficient bandwidth on the FTI networks to support the CWSU Web portal and the two-way operation communications capabilities. The FAA must also ensure that their users have appropriately scaled computer and telecommunications equipment to use NWS products and services.

1.4.2 Information and Production Systems

CWSU meteorologists will initially have several meteorological and aviation information systems available for analysis and product generation. Some of these systems are specific to NWS production, while others are integral parts of the FAA's daily operations. All of the display systems must be available during the interactive online collaboration sessions. These systems include:

- **NAWIPS:** This system is a CWSU meteorologist workstation that enables forecasters to produce the CWIP and monitor current and forecast weather conditions.
- **CIWS/ITWS:** The FAA will need to ensure access of CIWS and ITWS at the CWSUs. To promote common situational awareness, we will integrate CIWS and ITWS functionality into the CWSU Web portal, the CWIP, and NAWIPS.
- **Aircraft Situation Display (ASD):** Our goal is to either incorporate ASD data into our CWSU Web portal, or purchase/install a flight data application such as Flight Explorer™. This promotes common situational awareness between the meteorologist and the FAA.
- **Briefing Presentation Tool:** The NWS's CWSU transition team, working with the FAA, will evaluate premier Commercial-Off-the-Shelf (COTS)/Government-Off-the-Shelf (GOTS) applications and select the one best suited to meet the FAA's briefing requirements. The selected application will enable the user to organize graphics, develop animations, and record the briefings with animation. These briefings will incorporate displays from the information and production systems mentioned above. All briefings will be available and archived on the CWSU Web portal.
- **Weather and Radar Processor (WARP):** The NWS and the FAA will work to determine how WARP and the WARP briefing terminals will be incorporated into the CWSU product and service suite. The NWS understands that while our entire product suite will be hosted and available through the CWSU Web portal, the FAA relies on WARP display for many other weather products.

1.4.3 NAWIPS/AWIPS II

Figure 1-5: NAWIPS Workstation

NAWIPS (depicted in **Figure 1-5**) is the meteorological data visualization and integrated product generation system currently used by the NCEP centers and planned for the CWSUs. NAWIPS provides a national scope of weather information and product generation. The implementation of NAWIPS at the CWSUs provides the following benefits:

- NAWIPS is a proven and configurable solution because of its ease of implementation.
- NAWIPS provides a common platform among NCEP centers and the CWSUs. Forecasters will have access to the same weather-related data sets and tools.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00226 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- NAWIPS provides common production tools, including CWAs and the CWIP, for all aviation forecasters, enabling product consistency and reduced training time.

Figure 1-6 presents the required NAWIPS equipment list for FOC.

Figure 1-6: Equipment List for FOC

Type Site	Equipment at Each Site
CWSU South	6 NAWIPS (4 monitors at each station) 6 Briefing PCs (2 monitors at each station)
CWSU North	6 NAWIPS (4 monitors at each station) 6 Briefing PCs (2 monitors at each station)
AWC CWIP Support	1 NAWIPS (4 monitors at each station) 1 Briefing PCs (2 monitors at each station)

1.4.3.1. Migration to AWIPS II

NAWIPS will be migrated to AWIPS II, the future forecast infrastructure for the NWS. Currently in development, AWIPS II is the new, extensible Service Oriented Architecture (SOA) that will support the entire NWS enterprise—including all NWS operational units. The NWS is planning the AWIPS II migration and anticipates integrating NAWIPS functionality at the CWSUs by the year 2012. A major benefit of the migration to the AWIPS II SOA is that the CWSUs will benefit from NWS-wide enhancements, such as data delivery and collaboration, already planned for the system after initial deployment. Hardware and software upgrades required to effect the final implementation of AWIPS II at the CWSUs are detailed in the Cost Proposal.

2.0 Management/Organization

In response to FAA needs, we revised our management approach, to increase oversight, leadership, and accountability of the aviation weather support to the NAS. Our solution provides dedicated staff to support 24/7 NAS operations as well as a dedicated, single POC, enabling the NWS and the FAA to immediately address and resolve any CWSU-related issues. We will work with the FAA to implement a Quality Management Plan (QMP) to measure and improve our aviation support.

KEY FEATURES

- A dedicated Transition Manager (TM) to oversee all aspects of the transition to the new business model.
- Predicated upon a successful DemVal, a dedicated POC (the AWC Director) is responsible for the overall program after completion of the transition.
- A dedicated transition team composed of transition SMEs and the necessary support structure to effect a seamless transition with minimal risk to continuity of operations.
- A QA Manager (GS-13) to monitor performance to ensure high-quality, standardized, responsive, and consistent NWS aviation products and services.
- An Aviation Liaison Officer (ALO) (GS-14) to ensure that both CWSU and FAA personnel remain up-to-date on the latest in weather forecast technologies and processes.

2.1 CWSU Staffing

Based on the collaborative FAA-NWS meetings in October 2008, and the subsequent FAA letter received by the NWS, we have developed a staffing profile to meet the FAA's requirements. Key staffing features are:

- A dedicated POC to address any CWSU-related issue.
- 24/7 remote briefings and service for FAA air traffic management from two CONUS CWSUs.
- Additional forecaster positions at the AWC to produce the CWIP.

Figure 2-1 summarizes the required staffing for the positions defined in the operations concept.

Figure 2-1: Staffing

Location	Staffing
CWSU North	1 Branch Chief (GS-15) 1 Aviation Liaison Officer (training/outreach) (GS-14) 5 Senior Forecasters (GS-14) 13 Forecasters (GS-13)
CWSU South	1 Branch Chief (GS-15) 1 Aviation Liaison Officer (training/outreach) (GS-14) 5 Senior Forecasters (GS-14) 13 Forecasters (GS-13)
AWC	Additional 5 CWIP Forecasters (GS-14)
Anchorage*	1 MIC (GS-13) 3 Forecasters (GS-12)
NWS Headquarters	Quality Assurance Manager (GS-13)
Total staffing	**50 Full Time Equivalents (FTE)**

* The Anchorage CWSU will not undergo any changes; the information is provided for staffing totals.

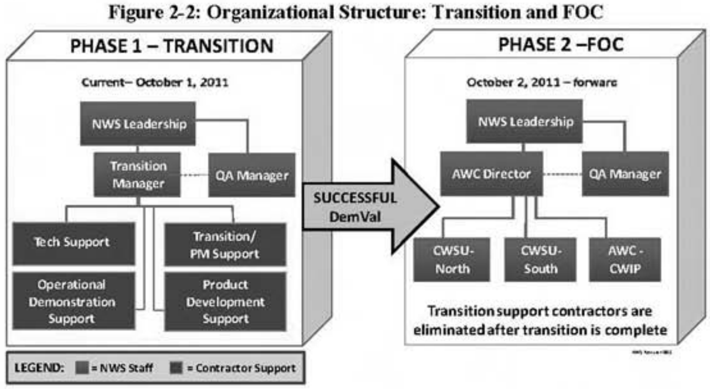
Based on NWS practices at other facilities, we have determined the grade structure for the CWSUs and increased AWC staff. The new CWIP forecast positions at the AWC will be GS-14, in line with the current grade structure at the AWC for forecasters performing similar duties.

2.2 Program Management

The NWS's management approach to the CWSU program is composed of two phases that are contingent upon the successful completion of the 9-month DemVal: Phase 1- Transition Phase; and Phase 2 – FOC.

Our dedicated Transition Manager (TM) will oversee the DemVal, and will be assisted by temporary contractor personnel. During Phase 1, the NWS TM will serve as the FAA's single POC for all transition-related issues or concerns. The TM will have oversight over the total transition, DemVal, and change management impacts associated with the new model. The TM will meet frequently with both the FAA and the NWS to provide status updates on the transition. The TM will also serve as the NWS's lead representative on the Board of Performance and Cost Review (BPCR). In addition, the TM will maintain frequent contact with the AWC Director, who will assume operational management and oversight of the CWSU program at the start of Phase 2 – FOC. Once the transition is complete, the TM position will be eliminated and the AWC Director will assume all management responsibilities associated with the CWSU program, including NWS representation on the BPCR. **Figure 2-2** depicts our proposed organization during each of the two phases.

Figure 2-2: Organizational Structure: Transition and FOC



Key Government personnel are either already on board, or will be competitively selected to ensure that they have the right level of experience and knowledge to effectively implement and manage the new business model. The key positions are the TM, the Quality Assurance Manager (QAM), the AWC Director (already staffed), and temporary contractor personnel. The NWS TM must have an aviation background and sufficient knowledge and experience with both the CWSU and NWS aviation program to oversee the transfer of operations to the new business model during the transition phase. The TM is expected to seamlessly hand over a fully functional CWSU program to the AWC Director upon transition completion. At that time, the TM and contractor support positions will be eliminated from the CWSU program. **Figure 2-3** presents brief descriptions of the required qualifications for each of these positions.

Figure 2-3: Key Personnel

Position	Qualifications
	PHASE 1 – TRANSITION
Transition Manager *Position eliminated after transition is complete*	GS-15 position. Possesses broad experience and familiarity with NWS Aviation programs. Has experience with outreach and change management. Experienced in managing transitions of similar complexity. Serves as the FAA's single POC for all transition-related issues.
Technical Support	Temporary Contractor Support. Provides IT/facilities consulting and related support as needed. Supports the 9-month DemVal and transition as needed. Oversees development of CWSU Web portal and SharePoint Transition portal.
Transition / PM Support	Temporary Contractor Support. Supports the TM by planning and executing transition tasks as assigned. Maintains cost, schedule, and transition metrics and status reports. Develops and maintains the CWSU Web portal and the SharePoint Transition portal. Supports the 9-month DemVal as needed.
DemVal Support	Temporary Contractor Support. Working with the TM, responsible for complete set-up and execution of the DemVal prior to independent evaluation.
Product Development Support	Temporary Contractor Support. Working with the TM, provides support for development and dissemination of CWIP, TRACON, remote briefings, and CWA products.
Quality Assurance Manager (new position)	GS-14 position. Monitors program performance to ensure high-quality, standardized, responsive, and consistent NWS aviation products and services. Maintains the QASP and addresses any noted deficiencies with the TM, AWC Director, and NWS leadership.
	PHASE 2 – FOC
AWC Director (existing position)	SES position. Experienced NWS leader with executive competencies needed to build a corporate culture that drives results, serves internal and/or external customers, and builds successful teams and coalitions. Manages the entire CWSU program and serves as the FAA's single POC for all CWSU issues (lead forecasters address real-time operational concerns).
Quality Assurance Manager (existing position)	GS-14 position. Monitors program performance to ensure high-quality, standardized, responsive, and consistent NWS aviation products and services. Maintains the QASP and addresses any noted deficiencies with the TM, AWC Director, and NWS leadership.

2.3 Reporting Requirements

We understand that effective reporting is critical to successful performance, and will provide all reports specified in the FAA's RD. For example:

- **Records Management:** The CWSUs will continue current record-keeping practices, creating and maintaining files that document the processing of work and other associated information.
- **Performance Data:** We will track, record, and monitor performance based on the information provided in the QASP and Performance Requirements Summary (PRS). Details of the approach to collecting and reporting performance data are provided in the QMP and the QASP.
- **Transition Reporting:** We will meet monthly with the FAA to provide progress reports and will provide written transition reports in accordance with the FAA's RD.
- **Operational Change Proposals (OCPs):** When required, the TM or AWC Director, as appropriate (per Phase) will generate OCPs. We recommend that the BCPR be used as the forum for discussion and approval of OCPs. The BCPR will conduct thorough reviews of change proposals and implement them accordingly. New metrics may be developed to measure the effectiveness of the change, and these will be reported to the BPCR under the quality program.
- **Facilities Implementation Plan (FIP):** The NWS will develop and submit the detailed plan to the FAA within 60 days of Authorization to Proceed with the DemVal. The plan

will show the changes in the equipment, facilities, and tools used in the day-to-day operations during the performance of the CWSU program. The FIP will also contain the number, location, and availability of the facilities, tools, and equipment. We will use the plan as the framework for implementing the changes outlined in our technical response and as the basis for reporting on FIP implementation.

Figure 2-4 lists our key Contract Deliverable Requirements List (CDRL) reporting documents.

Figure 2-4: NWS Reporting Documents

CDRL	Title
001	Quality Management Plan
002	Transition Reports
003	Operational Change Proposal
004	Facilities Implementation Plan

2.4 Board of Performance and Cost Review

The NWS considers the BPCR an essential mechanism for maintaining the quality required for a successful CWSU program and identifying and resolving issues quickly. The BPCR is a key element of our QMP, which addresses all aspects of customer satisfaction and effective performance. The BPCR's quarterly reviews ensure compliance with the terms of the new FAA-NWS Interagency Agreement. The BPCR may also meet on an as-required basis to consider urgent issues that should not wait for the next quarterly meeting. Agendas for the meeting will include reporting on the Acceptable Performance Levels (APLs), cost reporting, proposed requirement and operational changes, and other open issues. The BPCR also provides a forum to address all issues and get the attention of senior management, resulting in increased participation by both the FAA and the NWS in issue management.

The BPCR provides an opportunity for the FAA and the NWS to exchange information regarding the impact of proposed changes on the quality of CWSU services, including changes to the QASP. In this role, the BPCR may address concerns regarding systemic performance issues elevated to their attention. The NWS may also discuss discrepancies in the surveillance conducted or data collected by the FAA.

We suggest that the BPCR include core team members from all levels of support from the CWSU program, as well as senior leadership from the NWS and FAA. The BPCR's composition ensures that all levels of the NWS organization participate in the continuous improvement of the quality of services and products provided under the CWSU program.

2.5 Cost, Schedule, and Performance Management

The NWS will use structured methodologies to manage the CWSU program. Inherent in any large program are cost, schedule, and performance risks, and the NWS will address these by using both experienced personnel and disciplined management processes. The key elements of the NWS's approach are drawn from industry best practices and include defining baselines, roles and responsibilities, reporting levels, and reporting requirements. Additional elements of our management approach include:

- Establishing a Work Breakdown Structure (WBS) and performance risks, and the NWS will address these by using both experienced personnel and disciplined management processes.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00231 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- Establishing a transition schedule that includes deliverables and milestones, as well as the DemVal, and conforms to the program's Integrated Master Schedule (IMS).
- Ensuring that program-level scope, schedule, costs, change requests, and performance metrics are tracked against a valid baseline.
- Collecting program data regularly and maintaining it on a planned SharePoint transition portal for use by NWS and FAA stakeholders.

The NWS will track and monitor cost, schedule, and performance over the life of the CWSU program and maintain the associated documentation on our proposed CWSU Web portal. This enables the FAA to view metrics, standard reports, and required deliverables from a single, easy-to-use location.

2.5.1 Performance Measures

The new performance-based structure enables increased communications between stakeholders and promotes continuous service improvement. The NWS will establish a CWSU Quality Program (QP) to address all aspects of performance measurement. Under the CWSU QP – described in detail in the Quality Management Plan – the FAA and the NWS will work collaboratively to ensure that services comply with FAA requirements and will agree on methods to continuously improve weather support processes. The QP formalizes the quality process and clearly defines the roles and responsibilities of CWSU personnel. All quality efforts support the NWS's goal of meeting and exceeding the Acceptable Performance Levels (APLs) in the Performance Requirements Summary (PRS).

The CWSU QP includes a formal site review that involves a comprehensive examination of the operation and performance of the CWSUs. The site review team will assess the CWSUs based on their contributions to the performance measures. The team will report its findings directly to the NWS Director.

2.5.2 Risk Management

An important component of effective risk management is communication across all lines within the CWSU program. In transitioning to the new CWSU Services model, NWS personnel leading this program (TM until FOC; AWC Director post-FOC) will maintain frequent communications with NWS and FAA leadership to ensure that all cost, schedule, and performance baselines are on track and progressing in accordance with the IMS and the WBS. In the event of any deviations, the TM or the AWC Director (depending on the phase) will work with the BCPR, NWS leadership, FAA stakeholders, and the QA Manager to proactively address risk and correct any deficiencies. The TM or AWC Director will document all known and potential risks in the Monthly Reports. Prior to FOC, the TM will have risk management and mitigation responsibility; in the FOC phase, the AWC Director will assume these duties.

Traditional risk assessment includes three steps: identification, estimation, and evaluation.

- **Identification** produces a list of events with risks likely to compromise project success.
- **Estimation** produces a probability of the risk events occurring.
- **Evaluation** results in a priority ordering of the risks based upon probability of occurrence.

Leveraging the experience of our TM, BPCR, and other personnel assigned to this effort, the NWS will assess the risks that directly apply to the overall CWSU Services model and construct a risk management plan that includes mitigating actions. Through the management of overall risks, the FAA will be assured of reduced risk in managing the CWSU Services model. **Figure 2-4** defines some of the risks we have identified for this business model, and associated mitigation actions.

Figure 2-4: Management/Operational Risk Analysis

Description	Impact	Mitigation Strategy
Interpersonal Communications	High	• Policy of timely, clear, and open communications • CWSU Web portal houses the latest information with regard to CWSU Services model status, FAQs, and other relevant data
IT Infrastructure	High	• Implementation of high-availability architecture to ensure real-time, on-time, all-the-time access, display, and delivery of CWSU products and services. • Continuous dialogue with the FAA to ensure security, reliability, and accessibility of two-way communication systems resident within the FAA architecture.
Performance	High	• End-to-end training to ensure that all personnel are equipped with the necessary information with regard to all aspects of the services provided. • QAM communicates APLs and monitors performance.
Customer Satisfaction	High	• Performance-based contract ensures levels of accountability • QAM monitors quality and communicates with FAA personnel • Customer satisfaction surveys provide feedback • Proactive communication ensures a clear operational picture
Product Performance	High	• Continuous monitoring of products • Collaboration with the FAA and AST members • Continuous enhancements made by Product Development Team

2.5.3 Managing Change

We recognize the need to manage change to ensure continuity, quality, and consistency of CWSU services, and to support the personnel affected by the new business model. Our strategy to manage change in the new business model focuses on performance requirements, cultural changes, and organizational impacts. As part of our strategy, the NWS will support AST personnel by enabling them to maintain and develop the skills required to ensure continuity, quality, and consistency.

2.5.3.1. Approach to Managing Changes

The foundation to any improvements in CWSU services must first occur through a paradigm shift within the NWS and FAA. Culture change is realized through training, implementing new technology, performance feedback, dedicated leadership, accountability, and a joint commitment and partnership to high-quality services.

To meet an improved national scope in services, the NWS will provide the AST with the information tools necessary to view weather and air traffic across the NAS, including national forecast products such as the CWIP. First, our proposed CWSU Web portal will provide common information to the AST and all stakeholders. Infusing new technology will further enhance our service-based culture. Second, we will develop specialized training to educate all AST members on the impact of weather on the NAS, along with customer service training. Third, we will provide a performance-based system, which is a natural enabler of change.

CWSU Aviation Liaison Officers (ALOs) will coordinate the necessary training for appropriate members of the AST; subjects include: the importance of weather forecasts impact to the NAS from a safety perspective, technology transition, and local area aviation weather knowledge. A full description of the NWS's training approach is located in Section 3.8.

Employing a performance-based system is a proven conduit of culture change. The process of performance feedback – especially through performance goals and rewards for exceeding those goals – is an important and effective motivator of change.

2.5.3.2. *Addressing Skill Gaps*

Employing a new business model requires implementing new forecast tools, software, processes, and enhanced services, as well as identifying current gaps in skills from using existing technology. Each will require associated training, content communication, or both. The success of change depends upon effectively communicating the model design to its internal and external customers. Without it comes the failure to understand goals and missions. Combining a change to CWSU culture with effective training on the skills needed to be proficient in new CWSU technology and providing a national scope, will translate to more accurate and effective support toward a safe and efficient NAS.

The NWS will communicate our vision and commitment to supporting the FAA through an extensive personal outreach effort by our management and leadership. In addition, we will provide webinars and online training modules to ensure that NWS personnel continue to support the FAA's mission of a safe and efficient NAS.

With each new technology implementation, the NWS will provide the necessary forecaster training on technology use and interpretation (e.g., CWIP forecasts). This training will be in the form of online modules and directed one-on-one training by the ALO or CWSU representative. FAA personnel in each ARTCC will receive similar training on the aviation weather products, services, and new technologies, as well as how each of these can be incorporated into air traffic management. The NWS ALO or CWSU will continue to provide training and conduct proficiency checks for NWS forecasters to include FAA phraseology, procedures, and air traffic weather impact knowledge. Key TMU personnel will also receive training as needed. Additional details of our training plan are addressed in Section 3.8.

2.6 Equipment, Facilities, and Tools

Based on the requirement for the new business model, the NWS will update its analysis of staff, equipment, and layout requirements for the two CWSUs and the enhanced functions at the AWC. Our experienced facilities personnel will develop a detailed FIP within 60 days of the FAA's Authorization to Proceed. Our FIP will include the space, equipment, and modifications required to conduct the 9-month DemVal.

2.6.1 Changes from the Baseline

NWS facility and IT experts have worked with NWS meteorologists to analyze the current floor plans, equipment, and tools within CWSUs and the AWC. We will combine this information with the operations concept of the Ft. Worth CWSU, which hosts some of the future technology and tools we intend to implement, to develop a notional layout. We will expand these plans to adjust for multiple desk operations, associated equipment, and increased staffing levels at the CWSUs and AWC.

As part of our new CWSU implementation effort, we will need to upgrade the facilities, ensure proper interfaces to FAA communications circuits, and install the necessary tools and equipment to assure continued high-quality aviation weather support. For example, the AWC and NCEP will require space for CWSU operations and management. Space requirements include operational work areas, workstations, training areas, and an equipment room.

3.0 Transition

The smooth, orderly, and timely transition to the new CWSU Services model can only begin after a successful DemVal. In addition, a thorough management approach and an accountable transition team are needed to incorporate the results of the independent evaluation of the DemVal. Our transition team will address all necessary aspects of the transition, including risk management, quality and performance management, change management, communications and coordination, staffing, and resources. Clearly defined project, risk management, and communications plans, integrated with quality management best practices, provide the roadmap to ensure an effective operation. Our transition plan describes specific transition management activities designed to reduce cost, schedule, and performance risks in completing a smooth transition.

Key Features

- A single POC during the transition – the TM – to oversee the CWSU transition from start to finish.
- A dedicated transition team to ensure that the CWSUs meet our stringent transition timeline.
- Conducting a DemVal with independent evaluation prior to the new business model assures no degradation of services.
- A dedicated SharePoint Transition portal to house all transition-related documentation, including status reports, training materials, and FAQs.
- An approach to retaining institutional knowledge to maintain continuity of operations and service levels during the transition.
- A sophisticated training approach covering new tools and technologies, operating procedures, and customer service.

The NWS has demonstrated its capability to effect large-scale transitions through the successful Modernization and Restructuring Effort (MAR). At the time, this enormous undertaking transitioned the NWS from legacy systems to a modernized, streamlined technology-based organization. As part of the transition, the NWS relocated personnel as appropriate. Many of these personnel are still on-hand and will lend their guidance and expertise to our transition team as we move to the CWSU Service.

Given our past success, the NWS offers a robust transition approach in evolving our services to the new business model. We see this transition as taking place in two major steps, whereby both are contingent upon a successful DemVal: standing down the ARTCC CWSUs, while concurrently standing up the new CWSU Services.

The following paragraphs highlight the key elements of our approach, to be refined by the transition team and presented to the FAA within 90 days of proposal acceptance and agreement by the NWS.

3.1 Transitioning to the CWSU-North and CWSU-South

At a high level, the NWS transition plan includes best transition practices and assigns an experienced TM to lead the effort. We will work with the FAA to ensure a seamless transition to achieve the goal of providing consistent, timely, and accurate 24/7 weather services. The NWS will provide a detailed transition plan within 90 days of proposal acceptance by the FAA.

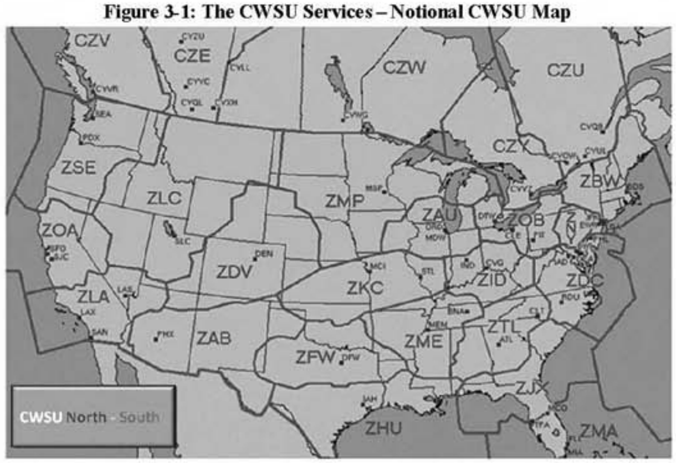
The NWS anticipates that at Initial Operating Capability (IOC), we will stand up a CWSU that is fully equipped with the new tools, technologies, and product-generation capabilities. This CWSU will mirror the activities of the legacy CWSUs before beginning operational cutover. Our detailed transition plan, to be provided to the FAA within 90 days of proposal acceptance, will include key information regarding the sequential transition to FOC.

At FOC, the NWS anticipates full implementation of the CWSU Service Model with the following attributes:

- **CWSU-North:** Located at the NCEP in College Park, MD, and staffed with 18 forecasters, 1 Aviation Liaison Officer (ALO), and 1 Branch Chief. This CWSU will support the FAA on a 24/7 basis.
- **CWSU-South:** Located at the AWC in Kansas City, MO, and staffed with 18 forecasters, 1 ALO, and 1 Branch Chief. This CWSU will support the FAA on a 24/7 basis.
- **CWIP Personnel:** In place and on-site at the AWC in Kansas City, MO, and staffed with five Lead Forecasters.
- **CWSU Anchorage, AK:** no change.

Figure 3-1 depicts a notional geographic demarcation of the two CWSUs. This proposed division will be validated during the DemVal.

Figure 3-1: The CWSU Services – Notional CWSU Map



As part of the NWS's transition planning, we include elements of change management to reduce overall risk. The TM is accountable for the success of the transition and will implement the basic elements found in **Figure 3-2** to ensure a successful transition.

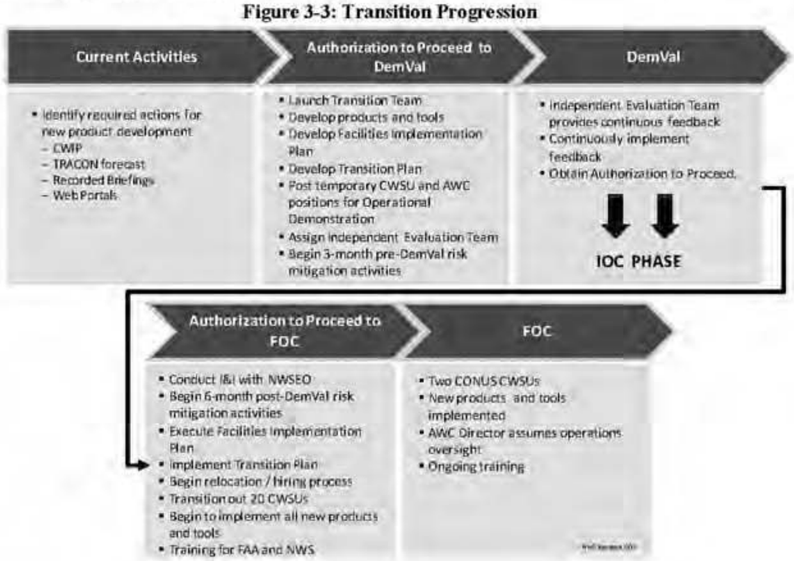
Figure 3-2: Transition Approach

Feature	Benefits
After the independent evaluation of the DemVal, and a decision made to proceed, the TM will lead the Transition Team in implementing the new CWSU services model as part of the IOC.	Transition with reduced risk and predictable results to effect the transition to the new CWSU Services model on schedule.
DemVal of new products, services, and supporting processes with independent valuation of operational readiness.	Ensures validity, accuracy, and effectiveness of products and services before operational turnover.
Clearly defined transition roles and responsibilities.	Ensures that transition plan is executed smoothly.

Feature	Benefits
SharePoint portal available to FAA, NWS, and CWSU personnel throughout the transition process.	Promotes open communications and a clear view into step-by-step transition processes, milestones, and progress.
Regularly scheduled transition progress meetings with FAA to reinforce partnership, align expectations, and report any issues or problems.	Establishes effective communications mechanisms to improve the FAA's visibility into transition and program activities and status.
Standardized training for all CWSU and FAA personnel.	Supports consistent and accurate forecast products. Expertise in use of tools, technology, and products supports safe and efficient NAS.

Our transition approach involves developing the new and improved products and services to support the FAA. Following the FAA's Authorization to Proceed, the NWS will begin a 3-month pre-DemVal activity to mitigate risk and prepare the appropriate staffing and technical resources. Following this 3-month planning activity, we will proceed with the 9-month DemVal. Upon independent validation that the DemVal is successful, our transition team will move forward with the transition process as part of IOC, moving equipment and personnel into the two CONUS CWSUs. We anticipate an additional 6 months of post-DemVal planning, again to mitigate against any risks to personnel, technical support, or other key areas that could affect FOC. The final phase of our transition approach involves establishing full operations in the new business model. **Figure 3-3** depicts our transition progression.

Figure 3-3: Transition Progression



3.2 Transitioning Out the ARTCC CWSUs

Our dedicated TM and the transition team will bring significant experience and expertise in effecting transitions of similar scope and complexity. These key individuals will develop a phased approach, based on industry best practices, to transitioning out CWSUs on a region-by-region basis. This approach provides multiple benefits to both the NWS and the FAA:

- Continuity of operations during the transition.
- Backup capability at each Center.
- Institutional knowledge retention during the transition.
- Seamless transition by standing up the incoming CWSUs while gradually standing down ARTCC CWSU operations.
- NWS and FAA personnel will be able to track status, read FAQs, and obtain other relevant information from our SharePoint Transition portal, described below.
- Cost minimization associated with transitioning personnel in both the stand-up and stand-down of CWSUs.

3.3 Transition Resources

Our experienced transition team is led by a NWS TM, who will be surrounded by a team of contracted experts to assist in the transition process. These contracted positions will begin upon receipt of the Authorization to Proceed with the DemVal, and will terminate upon reaching the FOC. These positions and associated roles are outlined in **Figure 3-4**.

Figure 3-4: Transition Roles and Responsibilities

Role	Responsibility
Transition Manager	• Oversees all aspects of the transition and provides status updates to NWS executive leadership • Performs all aspects of program management related to transition activities, including planning, monitoring, control, and scheduling • Communicates and facilitates NWS-FAA activities across all functional areas supporting the transition • Plans, develops, delivers, and evaluates all transition-related communications with CWSU personnel • Provides oversight on all transition reporting, deliverables, and performance • Leads formation of BPCR and provides monthly status reports to FAA staff • Communicates with the entire transition team to ensure common knowledge
Technical Support (Contractor)	• Provides training on new tools and applications • Defines technical aspects of program, such as equipment needs • Communicates and facilitates activities across all functional areas supporting the transition • Manages technical integration of systems, data communications links • Oversees development of CWSU and Transition portals • Assesses current configurations, security, reporting capabilities • Installs and configures new equipment • Troubleshoots system and equipment issues • Communicates with the entire transition team to ensure common knowledge
Transition/PM Support (Contractor)	• Supports the TM in all aspects of program management related to transition activities including planning, monitoring and control, and scheduling • Supports the TM in communicating and facilitating NWS-FAA activities across all functional areas supporting the transition, including Transition portal documentation • Tracks transition reporting, deliverables, and performance • Updates status reports to TM

Role	Responsibility
	• Provides project support to the TM and the DemVal team as needed. • Updates transition and demonstration schedules • Manages logistical needs associated with both transition and demonstration • Performs administrative duties as assigned • Communicates with the entire transition team to ensure common knowledge
DemVal Support (Contractor)	• Oversees all aspects of the DemVal, including people, process, tools, and technology considerations. Includes the following activities: ○ Communicates and facilitates activities across DemVal development and evaluation ○ Manages technical integration of applications and weather products ○ Assesses current application configurations, security, reporting capabilities ○ Coordinates with the Technical Support contractor to install and configure new tools/applications ○ Monitors performance of new tools/applications during DemVal development ○ Troubleshoots application issues • Reports on all DemVal-related activities to the TM • Conducts internal reviews on the DemVal • Communicates with other members of the transition team to ensure common knowledge
Product Development (Contractor)	• Oversees development of all product development activities, including CWIP/TRACON forecasts, remote briefings, and others as necessary • Coordinates with Technical Support contractor on web development activities • Reports to the TM on all product development activities and status • Manages technical integration of applications and weather products • Communicates with the entire transition team to ensure common knowledge

To ensure a seamless transition and full participation by the FAA, we recommend that the FAA appoint a transition liaison as the key interface with the NWS Transition Team. We propose that NWS-FAA working groups coordinate implementation details (e.g., facilities, communications, remote briefings, and QASP implementation). A DemVal is required prior to deploying new products, services, and processes.

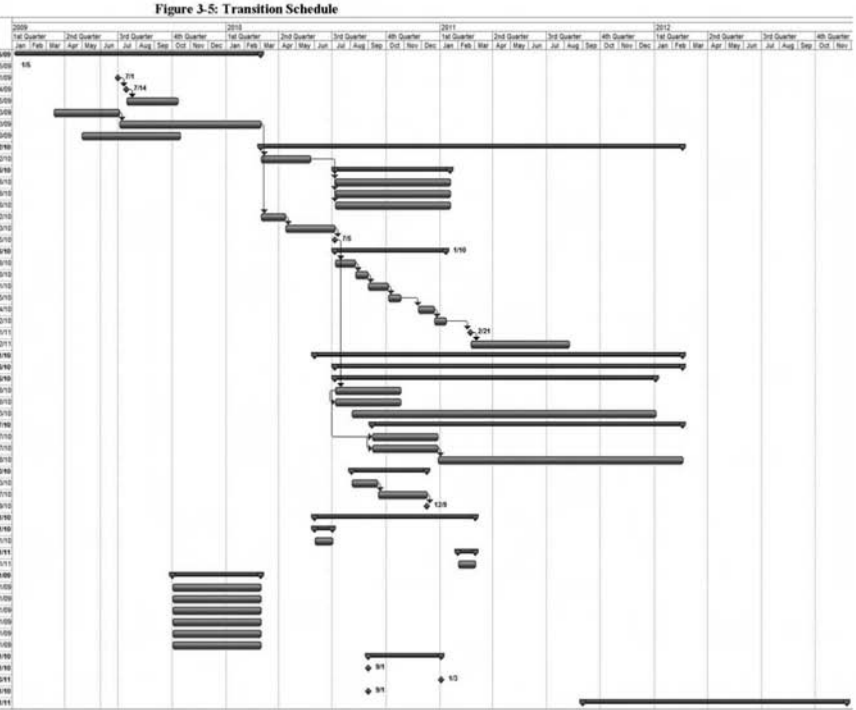
3.4 Transition Schedule

The transition schedule presented in **Figure 3-5** incorporates risk mitigation activities prior to (3 months) and after (6 months) the DemVal. In this schedule, the NWS implements the technical and management approach and achieves full operation within 42 months from transition start. The main schedule drivers are the Impact and Implementation (I&I) process with the NWS Employees' Organization, personnel processes to bid and fill new positions, the installation of NAWIPS systems, training of new CWSU and AWC staff, and the DemVal. The proposed timelines are based on the experience of our transition team in transitions of similar scope and complexity.

As an alternative, the NWS will work toward an accelerated transition schedule of 33 months, provided that personnel and technical issues are resolved early.

Figure 3-5: Transition Schedule

ID	Task Name	Duration	Start
1	**Programmatics**	**301 days**	**Mon 1/5/09**
2	Deploy Transition Team	0 days	Mon 1/5/09
3	FAA Acceptance	0 days	Wed 7/1/09
4	Kickoff	0 days	Tue 7/14/09
5	Develop and Deliver Final Transition Plan	63 days	Wed 7/15/09
6	Pre DemVal Business and Risk Mitigation	4 mons	Fri 3/13/09
7	Pre-DemVal activities	172 days	Fri 7/3/09
8	Pre-decisional I & I	6 mons	Thu 4/30/09
9	**Business & Technology Activities**	**514 days**	**Tue 3/2/10**
10	Recruit DemVal Personnel	60 days	Tue 3/2/10
11	**Develop New Technology**	**140 days**	**Tue 7/6/10**
12	CWP development and demonstration	7 mons	Tue 7/6/10
13	Remote Briefing development & demonstration	7 mons	Tue 7/6/10
14	CWSU Web Portal Development and Demonstration	7 mons	Tue 7/6/10
15	Assemble Indep. Eval Team	30 days	Tue 3/2/10
16	Facilities for DemVal at AWC	60 days	Tue 4/13/10
17	Ind Eval Approval to begin DemVal	0 days	Mon 7/5/10
18	**Start DemVal**	**135 days**	**Tue 7/6/10**
19	Functional testing (Spring/Convection)	25 days	Tue 7/6/10
20	DemVal Platform modifications (Spring/Convection)	15 days	Tue 8/10/10
21	Functional testing (Summer)	25 days	Tue 8/31/10
22	DemVal Platform modifications (Summer)	15 days	Tue 10/5/10
23	Functional testing (Autumn/Winter)	20 days	Wed 11/24/10
24	Finalize Platform	14 days	Wed 12/22/10
25	Ind Eval Final Approval	30 days	Tue 1/11/11
26	Post-DemVal activities and risk mitigation	6 mons	Tue 2/22/11
27	**I&I and Staffing**	**449 days**	**Tue 6/1/10**
28	**Government Personnel**	**424 days**	**Tue 7/6/10**
29	**CWSU South**	**390 days**	**Tue 7/6/10**
30	Recruit Branch Chief	4 mons	Tue 7/6/10
31	Recruit ALO	4 mons	Tue 7/6/10
32	Recruit Forecasters	370 days	Tue 8/3/10
33	**CWSU North**	**379 days**	**Tue 9/7/10**
34	Recuit Branch Chief	4 mons	Tue 9/7/10
35	Recruit ALO	4 mons	Tue 9/7/10
36	Recruit Forecasters	299 days	Tue 12/28/10
37	**AWC CWP**	**93 days**	**Tue 8/3/10**
38	Recruit Forecasters	32 days	Tue 8/3/10
39	Phase in Forecasters	3 mons	Fri 9/17/10
40	CWP Forecasters assume full operational control	0 days	Thu 12/9/10
41	**Contractor Staff**	**196 days**	**Tue 6/1/10**
42	**CWSU South**	**23 days**	**Tue 6/1/10**
43	Hire ITO	23 days	Tue 6/1/10
44	**CWSU North**	**21 days**	**Tue 2/1/11**
45	Hire ITO	21 days	Tue 2/1/11
46	**Training Development (CBT)**	**108 days**	**Thu 10/1/09**
47	Change Management/orientation	108 days	Thu 10/1/09
48	Local Knowledge	108 days	Thu 10/1/09
49	Proactive Communications	108 days	Thu 10/1/09
50	Customer Service/Customer Needs	108 days	Thu 10/1/09
51	Technology	108 days	Thu 10/1/09
52	Concept of Product Use	108 days	Thu 10/1/09
53	**Facilities**	**88 days**	**Wed 9/1/10**
54	**CWSU South**	**0 days**	**Wed 9/1/10**
56	**CWSU North**	**0 days**	**Mon 1/3/11**
58	**AWC CWP**	**0 days**	**Wed 9/1/10**
60	**Transition to Two CWSU model**	**322 days**	**Thu 9/1/11**



3.5 Personnel Changes

We recognize that with a transition of this magnitude, personnel changes will be necessary to effect a smooth transition and to maintain consistent, accurate, and reliable aviation weather products and services. As part of our personnel transition approach, the NWS must consider the following key transition elements and their corresponding benefits to the FAA:

- **Knowledge Retention:** The NWS will retain existing personnel to the extent possible to maintain institutional knowledge and continuity of operations.
- **Maintaining Employee Morale:** We will provide effective Human Resources (HR) support to those personnel who are relocating or experiencing career changes, to minimize negative impacts on the employees.
- **Satisfying Legal Requirements:** The NWS must conduct successful I&I negotiations with the NWS Employees' Organization prior to any personnel relocations. This element is critical to ensuring a smooth transition of personnel with minimal impacts to ongoing operations.
- **Transitioning Personnel During the DemVal:** The NWS will require support as we maintain full service, stand up the 9-month DemVal, and stand down remaining CWSUs across the country.

HR planning for this transition, including internal I&I, will begin immediately upon receipt of Authorization to Proceed from the FAA. NWS leadership will work closely with our HR department to implement the HR plan upon successful DemVal completion and the subsequent Authorization to Proceed from the FAA.

3.6 Technology and Equipment Changes

The effective communication structures proposed between the meteorologists and the FAA will enable cost-effective communications in easy-to-use formats. As previously discussed, the NWS will enhance existing communications and implement new operational technologies. These include traditional telephone services, instant messaging (subject to stringent IT security controls), and interactive web-enabled collaboration.

In addition, it is critical to evolve the CWSUs to the NAWIPS environment. During the transition period, the NWS will install NAWIPS systems and workstations in both CWSUs, as well as the CWIP component at the AWC. Additional suites of forecaster and briefer equipment to support DemVal activities are required at the CWSUs. Following independent evaluation of DemVal results, our transition team will follow a systematic methodology to test and roll out equipment and tools. With each deployment of technology and equipment, the transition team will coordinate activities with the FAA.

3.7 Tools to Support Transition Management

SharePoint Transition Portal: All relevant transition data generated, collected, and tracked will be stored on this portal so that FAA stakeholders can access the information at any time. The secure portal will allow both FAA and NWS stakeholders to have full visibility into progress, current activities, trends identified, and developing solutions. Since our portal is a collaborative tool, the FAA may elect to provide feedback outside of the regularly scheduled transition progress reviews. All feedback will be stored on the portal, enabling easy access to historical data.

The following are examples of what will be included on the portal:

- **Status Tracking:** The portal will show at a glance the status of personnel, equipment, transition activities, and training.
- **Management:** The portal will house documents and templates for HR along with forecaster schedules and planned training.
- **Personnel:** Frequently Asked Questions, newsletters, or news items.
- **Training Materials and Schedules:** As we transition new equipment and tools, CWSU personnel will receive appropriate training to ensure continuity of service. Our portal will provide a single source of access to online training modules, as well as display training schedules. Training participants will be able to post their feedback regarding the training.
- **Transition Checklists:** NWS personnel will create, maintain, and update transition checklists as each Center's tools, technologies, systems, and personnel are transitioned. The checklists will specify the responsible individual, due date, and status for each transition activity, along with a description or explanation of any transition issues. The checklists will show a synopsis of the problem; the Center location, the date the issue or problem was discovered; its resolution; the date the issue or problem was resolved; and any other information deemed critical.

3.8 Training for CWSU Personnel

The NWS and the FAA agree that training will be a critical success factor provided the DemVal is successful and we transition to the new CWSU Services model. During the transition period, the NWS will conduct DemVal training for FAA, CWSU, and AST personnel. Training will be provided using web-based training (WBT), computer-based training (CBT), and Distance Learning modules. As part of our overall transition approach, all AST personnel will receive standardized training, ensuring:

- A common understanding and command of the tools/technologies they will be using.
- Consistent and accurate weather products and services.
- A common view of the regional and NAS forecasts.
- Familiarization of NAS structure and weather impacts at the national level.
- Knowledge gathering in the evolution to the FAA's NextGen.

We will base much of our training on existing modules to increase efficiencies and leverage best practices already available. We will ensure that incoming or new personnel receive forward-looking training to enable the evolution to NextGen. Included in the training are modules on the CWIP product suite. We will make the same training available to FAA personnel as mutually determined.

During and after the transition, the NWS will conduct training in the following areas:

- **Change Management / Orientation:** This 2-hour webcast module will enable participants to fully understand their roles and responsibilities in the new business model, their respective chain(s) of command, and the interrelationships of the AST. A critical component of this module is helping CWSU and AST personnel to understand how the new business model operates in the aviation weather support context, and the new expectations associated with the new way of doing business.
- **Local Knowledge:** This module will provide local forecast knowledge from the WFO, as well as knowledge on how weather impacts traffic at the local ARTCCs. When combined, this information will be invaluable to forecasters who have wide-reaching responsibilities.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00242 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- **Proactive Communications:** This module will equip participants with the skills needed to replace the traditional face-to-face ("eyeball-to-eyeball") briefings with high-tech, innovative communications tools and weather products while maintaining trusted relationships with their FAA counterparts. Forecasters need to provide timely, accurate, and site-specific briefings from remote locations while anticipating FAA weather support requests.
- **Customer Service / Customer Needs:** This module will provide forecasters with essential customer service skills designed to assure continuity of service from remote locations. In the absence of in-person communications, CWSU and AST personnel must remain fluent in the "FAA language" to ensure on-target oral and written communications.
- **Technology:** This module, provided by the NWS Training Center, will offer practical, step-by-step instruction on the use of the new systems and technologies deployed at the CWSUs. Participants will develop an in-depth understanding of the technology available to them and how to best leverage it to ensure consistent products, accurate forecasting, and timely weather updates. A Distance Learning module can be developed for FAA employees if desired.
- **Concept of Product Use:** This module will provide FAA personnel with a user-friendly guide to understanding the CWIP and its application to FAA decision-making operations.

These training modules will provide both FAA and NWS staff with critical understanding of all facets of the new CWSU model while minimizing the impact of training on staff time. Personnel to be trained include weather coordinators, Certified Professional Controllers, and the ARTCC and ATCSCC facility managers. CWSU Aviation Liaison Officers (ALOs) and the appropriate CWSU staff will conduct the majority of training, with periodic visits to ARTCCs to conduct refresher training. As part of our approach to continuous improvement, we will request that other CWSU forecasters, once trained by the ALOs, assist in training incoming meteorologists.

In addition to the above-listed courses, the NWS recommends that the FAA provide CWSU personnel with the FAA Traffic Management Unit 50116 course to further enhance their understanding of the Weather/Air Traffic Relationship.

The NWS will meet with FAA staff to update training content on a periodic basis. The training will build on existing materials and training approaches to minimize cost. In addition, the NWS will provide ongoing personnel training to ensure that knowledge and skills remain up-to-date.

3.9 DemVal

The NWS believes that DemVal success is a prerequisite to any implementation of the new CWSU Services model. To that end, we will continually seek to enhance our products and services to ensure that upon FOC, the FAA continues to obtain consistent, reliable weather support services.

> **Key Features**
>
> - The NWS is fully committed to conducting a comprehensive, 9-month DemVal prior to any implementation.
> - The DemVal will be assessed by a group of independent evaluators to ensure that this business model is robust and meets FAA users' requirements.

Upon Authorization to Proceed, the NWS will develop and conduct the DemVal to determine the success of the final state – the implementation of CWSU Services. A key component of our DemVal is safety – continuity of consistent, accurate weather support leads to the FAA's goal of maintaining a safe and efficient NAS. To accomplish this, we propose to conduct a 3-month risk mitigation activity prior to launching the DemVal. At that point, the NWS will conduct the DemVal to verify the validity of the new business model over various weather regimes during a 9-month period. By conducting the DemVal over 9 months, the NWS will have the opportunity to test, verify, and validate the soundness and functionality of all systems and products, enabling a seamless transition. After completion of the DemVal, we propose to conduct additional risk mitigation activities over a 6-month period. Key features of our DemVal include:

- **Independent Evaluation:** An independent evaluation team, comprising members from Government and industry organizations, will be appointed. As necessary, the NWS will add non-Government participants as part of the independent evaluation team. From the outset, this team will determine if the DemVal is appropriately structured to validate the new concept of operations. This validation must occur prior to launching the DemVal.
- **Continuous Improvement:** During the 9-month DemVal, the independent evaluation team will meet periodically to provide feedback, recommendations, and corrective actions with regard to the ongoing, 9-month DemVal. This timeframe enables the NWS to continuously assess and adjust the DemVal as needed to ensure a successful final transition.
- **Validation:** Following DemVal completion and prior to the FAA's Authorization to Proceed, the same independent evaluators will reconvene to determine the success of the DemVal.
- **Redundant Staffing:** To support the DemVal, the NWS will place two additional forecasters at the AWC for CWIP, and five additional forecasters at the CWSU-South, also located at the AWC.

3.10 Risk Analysis

Our risk analysis is a key tool to identifying and mitigating potential risks during the transition period. As part of our analysis, and as described in Section 2, we will also continually monitor, evaluate, and mitigate risks. Traditional risk assessment includes the steps of identification, estimation, and evaluation. Based on the NWS's risk assessment approach, we have identified some risks associated with the transition in **Figure 3-6**.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00244 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Figure 3-6: Transition Risk Analysis

Description	Impact	Mitigation Strategy
DemVal deficiencies during execution	High	• Continuous evaluation and improvement during course of DemVal; continuous feedback loops; clear and open communication with all stakeholders.
Incumbent personnel wish to retire/decline to relocate	High	• The NWS will identify, in advance, the staff necessary to transition to the new model • Knowledge transfer practices for new personnel
Change management issues with CWSU personnel	Medium	• The NWS, through education and outreach to staff, will provide training to effect a cultural shift and enhanced understanding of the new operational model. • TM handles all change management and communications proactively with transitioning and new personnel
Personnel Phase-in and Phase-out issues	High	• The NWS's staffing plan already provides 24/7 weather coverage, and includes mitigation strategies for phasing of staff • Phased staffing from NWS provides qualified personnel around the nation
Communications Failure	High	• Policy of clear and open communications • SharePoint Transition portal houses transition documentation, including FAQs
Full suite of new weather products not ready by FOC	High	• Continue to use existing weather products while new ones are completed.
Staffing, technical, or management issues	High	• Pre- and post-DemVal risk mitigation activities to ensure availability and full training of personnel, as well as system operability.

The NWS will leverage the experience of our TM and the transition team to continually assess the risks that apply to transition. Based on these assessments, we will construct a risk management plan that includes mitigating actions. Through the management of overall risks, the FAA will be assured of a smooth transfer of equipment, personnel, and services.

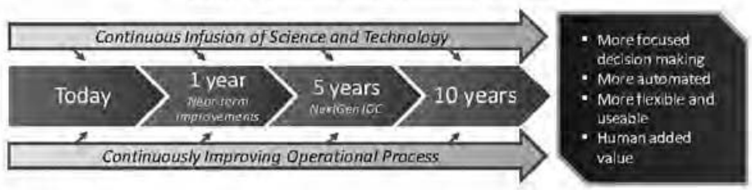
4.0 Continuous Improvements and Moving to NextGen

The future needs of the FAA include a transition to NextGen, with IOC in 2013 and FOC in 2025. We fully support the multi-agency, system-wide transformation to NextGen. NOAA has participated in Joint Planning and Development Office (JPDO) planning efforts and has used the Integrated National Plan as a guide in developing the NWS vision for future aviation support.

4.1 Product Evolution

Many aviation products today are in a textual format and are very labor-intensive. Over the next 5 years, additional elements will be included in NDFD as we move forward towards the NextGen era; this will allow for several efficiencies in the production of the legacy textual products. Furthermore, advances in the automation and rapidly updated (hourly) forecast routines of convective, low ceiling and visibility, icing, turbulence, and wind in a digital environment will enable the NWS to streamline its forecast process to gain additional efficiencies. The anticipated advances in the science and technology underpinning aviation weather support will enable evolution of CWSU products and services to make them increasingly effective. **Figure 4-1** depicts our projected timeline to incorporate these advances in science and technology, bringing the NWS fully on board in the NextGen era.

Figure 4-1: Science and Technology Timeline



3

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00246 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

#10

Federal Aviation Administration
Center Weather Service Unit – Requirements Document

June 3, 2009

Table of Contents

List of Figures

1.0 Overview

The National Weather Service (NWS) is pleased to provide the Federal Aviation Administration (FAA) with a revised cost proposal for the new Center Weather Service Unit (CWSU) Services. Our costs are based on your Requirements Document (RD), our collaborative meetings in October 2008, and the subsequent FAA letter received by the NWS. Our approach addresses three levels of needs:

- Enhancements to current CWSU products and services.
- The new requirements articulated by the FAA.
- A path to immediate technology expansion and leading support of NextGen is put in place.

These needs are addressed in the context of a vision for providing weather decision assistance that aligns fully with the FAA expressed requirements. Our approach includes centralizing CONUS CWSU operations into two locations: CWSU South: the Aviation Weather Center (AWC) in Kansas City, MO; CWSU North: the NCEP in College Park, MD. We have also included CWSU Anchorage: the ARTCC in Anchorage, AK, although there will be no operational changes there. Forecast support for these locations will come from the various components of the Aviation Services Team (AST). This approach ensures streamlined operations, along with standardized, responsive, and consistent services. Key elements of the AST's support drive standardized services, national scope, and product consistency. These elements include:

- **Collaborative Weather Impact Product (CWIP):** The CWIP provides a collaborative hourly forecast out to 12 hours (updated every 2 hours) for convection, precipitation type and intensity, ceiling, surface visibility, winds, icing, and turbulence – depicted on multiple graphics. Members of the AST will collaborate with the FAA and private industry before issuing the products. Product issuance times will be synchronized with the 2-hourly FAA strategic planning process and to support the Strategic Planning Team telcons.
- **CWSU Web Portal:** CWSU-specific products, including the CWIP and CWAs, as well as national, regional, and local weather briefings, will be available to the FAA and other users through direct access to the CWSU Web Portal. Our proposed portal serves as a "one-stop shopping" approach, and offers users one-touch access to initiate instant messaging sessions or to request/initiate on-demand weather briefings.

NWS's Capability and Experience for Successful Performance

- **Cost-Conscious Team:** Reduces the cost of staffing and places personnel at Kansas City, College Park, and Anchorage for strategic planning across the NAS
- **Lowest-Cost Structure:** Staffing model offers greatest flexibility in meeting FAA needs
- **Performance Stability:** NWS has more than 4,000 employees dedicated to weather, along with an Aviation focus, providing a vast infrastructure benefiting the FAA with no additional program cost.
- **Technology Advancement:** Technology investment through NAWIPS/AWIPS II will directly contribute to current technology and future NextGen advancement.
- **Realistic Pricing:** Our close knowledge of the current contract pricing means that our pricing estimates are accurate and realistic. Given the critical safety nature of services, costs have been carefully considered to avoid unrealistic promises of aggressively low pricing, only to subsequently recognize cost and schedule program overruns.

- **Interactive On-Line Collaboration Tools:** The FAA and the CWSU meteorologist will use state-of-the-art collaboration tools to ensure immediate remote access to one another. These tools include an instant messaging feature and interactive on-line collaboration software used for on-demand briefings, consultations, and urgent problem solving. This software tool will allow two-way annotation of graphics, also known as "white-boarding."
- **Fully Redundant CWSUs:** The structure of the CWSU solution provides for full mirror image capability while delivering 24/7 service. This will ensure a hot backup of critical aviation weather services.

1.1 Financial Considerations

Current FAA statistics indicate that weather is a factor in nearly three-quarters of all air carrier delays. The FAA estimates that this is a $41 billion socio-economic impact to the U.S. economy; nearly two-thirds of which is deemed preventable by providing more accurate and consistent weather information and by further integrating improved observations and forecasts into NAS decision making. These statistics reflect the importance of weather forecasting, far beyond the cost of the CWSU program. The accuracy and consistency improvements delivered by the NWS aviation weather program will provide critical weather decision support to traffic management personnel to reduce the impact of weather on the safe and efficient flow of air traffic.

Critical Service Continuity

The NWS WFOs and AWC unit have a history of successful collaboration and transition. The FAA benefits from the seamless nature of this relationship and the smooth and cooperative handoff of knowledge and capabilities associated with the new CWSU Services model.

The NWS transition plan includes transition best practices, an experienced Transition Manager (TM) to lead the effort, and a comprehensive Demonstration / Validation (DemVal). Our approach is contingent upon a successful DemVal, conducted over a 9-month period of stringent testing to capture seasonal weather scenarios. Our DemVal will be evaluated by independent groups from Government and Industry. In the final analysis, a successful DemVal ensures that the new business model is implemented with no degradation in service.

We will work with the FAA to ensure a seamless transition to achieve the goal of providing consistent, timely, and accurate 24/7 weather services.

Financial Summary

The NWS has the capability, experience, energy, and desire to provide the FAA with excellent technical services and best-value services. The new CWSU Services model provides an opportunity for excellent cost savings/avoidance, an increase in performance, and significant advances in technology to support aviation weather forecasting advancement.

1.2 Cost Reasonableness, Realism, and Accuracy

The NWS team has been providing the staffing and technology associated with the CWSU for a number of years. We have used this real experience from our personnel to develop realistic rates for the new CWSU Services model cost proposal. The NWS employed an extensive review process of its pricing to ensure that our proposed rates were competitive and realistic. Utilizing existing staff and benchmarking against industry surveys, the NWS is prepared to deliver value to the FAA.

Our proposed staff includes incumbent employees to be transitioned to the new business model, along with a core team largely drawn from extensive existing NWS resources. Direct labor costs were estimated based on the FAA's RD, appropriate education/experience qualifications, and comparisons to and validated by salary surveys from several sources. The NWS cost is realistic with actual labor rates used where possible for the skilled incumbent personnel proposed for this program. The NWS fully understands the scope of work and the specific skills needed to effectively respond. This directly relevant labor base and pricing ensures the FAA is receiving best value services aligned with stated objectives.

The resulting labor rates were applied to establish consolidated staff labor categories and rates for Contract Year 1. Contract Year rates were then escalated based on the defined labor escalation rate for each subsequent Year as further described below.

To maximize cost realism, the NWS has prepared and reviewed costs for both reasonableness and credibility. All costs proposed reflect competitive salaries and fringe benefits.

Realistic Cost:

- Systematic bid rates and estimating system ensure realistic direct labor rates which support specific education and experience qualifications necessary to perform this effort. For reasonableness, the NWS also compared labor rates against the Economic Research Institute (ERI) salary survey based on the specific experience levels proposed.
- The proposed overhead pools are consistently applied to all other NWS functions.

Reasonableness:

- The NWS conducted an independent, objective verification of our proposed direct labor rates using external consultants and internal expertise.
- Salary Survey Data verification of proposed direct labor rates ensure salaries commensurate to education and experience of each labor category.
- The NWS benchmarked proposed direct labor rates against commercial pricing practices to ensure labor rates commensurate to education and experience of each labor category.

Completeness:

- Proposal structure and cost formats satisfy all solicitation requirements.

In addition to a thorough process focused on realistic, competitive pricing, the NWS has placed a strong emphasis on ensuring the accuracy of its submission. The accuracy of costs included in this volume was enhanced by the use of prescribed cost templates for all cost estimators. No cell, formula, or other modification was made to these templates. The internal price worksheets were tested for formula accuracy and test totals were used for linked data. As a final check, a pricing team reviewed salary information and rate information against GS schedules and performed a check on all prices submitted.

2.0 Cost Summary

The introduction of the new CWSU Services will result in 50% greater dedicated presence at 21% lower cost than the FAA is currently spending. The NWS has developed its solution to provide for both 24/7 service coverage and hot service backup. In addition, the new model will provide new products and services, such as the CWIP, TRACON forecasts, and remote briefings through enhanced technologies.

Figure 2-1 provides a comparison of current spending levels ($12M+) as compared to the new CWSU Services model. This calculation is based on a fully implemented model at 2009 pricing ($9M+). The result is a savings to the FAA of $2.5M- $3M.

Figure 2-1: Comparison of Spending Levels

Location	Total Cost
Total 2009 Base Estimate	$9,731,146
Current Spend Rate	$12,283,836
Savings	*$2,552,690*

Figure 2-2 reflects the annual budget for transitioning the 20 CONUS CWSUs[1] to the fully implemented new CWSU Services model, contingent upon a successful DemVal. The transition schedule and pricing include the DemVal and product/service development initiatives (CWIP, TRACON, and remote briefings), as well as staff transition. We have planned this transition with redundant systems and personnel to ensure no degradation of services. With this plan, the first new CWSU (CWSU-South) will be operational by July 1, 2011.

By 2013, the cost profile reflects the entire new CWSU Services model.

Figure 2-2: Annual Budget to Transition 20 CONUS CWSUs

	2009	2010	2011	2012	2013	Summary
Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total Base
Legacy CWSUs	$12,283,836	$12,650,748	$11,692,893	$1,604,612	$0	$38,232,089
Transition	$4,616,468	$4,015,999	$3,002,353	$1,143,598	$0	$12,778,418
New CWSUs	$0	$0	$4,834,052	$10,761,541	$10,971,413	$26,567,006
New CWSU Model	$16,900,304	$16,666,747	$19,529,298	$13,509,751	$10,971,413	$77,577,513

The following sections describe the price buildup of the new CWSU Services model and the high-level transition plan.

3.0 CWSU Services Model

The new CWSU Services model will transition the existing 20 CONUS CWSUs into the new environment. Costs will continue until the new CWSUs are brought online, subject to a successful Demonstration/Validation (DemVal), and as outlined in the Transition plan. Legacy CWSU costs have been estimated through the stand-down transition. **Figure 3-1** presents the annual schedule of costs projected for existing CWSUs until stand-down.

Figure 3-1: Annual Schedule of Costs Projected from Legacy CWSUs

Description	2009	2010	2011	2012	2013	Total Base
Labor	$12,233,436	$12,600,348	$11,646,493	$1,597,412	$0	$38,077,689
Other Direct Cost	$50,400	$50,400	$46,400	$7,200	$0	$154,400

[1] Alaska is included in cost, but services are not changed.

Total Cost	$12,283,836	$12,650,748	$11,692,893	1604612	0	$38,232,089

Once the NWS stands up the new CWSUs, the costs in the above table (for legacy CWSUs) will decrease, to be replaced with the lower cost structure of the new CWSUs as they are stood up. **Figure 3-2** presents the schedule of costs related to stand-up of new CWSUs.

Figure 3-2: Schedule of Costs Related to CWSU Ramp Up

	2009	2010	2011	2012	2013	Total
Labor & Indirects	$0	$0	$4,286,602	$9,487,416	$9,772,080	$23,546,098
Travel	$0	$0	$32,500	$65,000	$65,000	$162,500
Equipment & Installation	$0	$0	$5,800	$176,765	$0	$182,565
Recurring Support and Tech Refresh	$0	$0	$0	$0	$48,710	$48,710
Training	$0	$0	$50,000	$50,000	$50,000	$150,000
Web Collaboration	$0	$0	$9,165	$20,296	$20,904	$50,365
ITO Contractor Support	$0	$0	$162,180	$343,824	$364,452	$870,456
Product and Service Improv Devel	$0	$0	$211,998	$449,436	$476,400	$1,137,834
Facilities	$0	$0	$75,807	$168,804	$173,867	$418,478
TOTAL NEW CWSU COST	$0	$0	$4,834,052	$10,761,541	$10,971,413	$26,567,006

3.1 Basis for Establishing Proposed Labor

The following paragraphs describe the labor-related cost elements used to price the new CWSU Services model.

Direct Labor

The NWS recognizes that with a transition of this magnitude, it is critical to maintain consistent, accurate, and reliable aviation weather products and services. **Figure 3-3** summarizes the staffing required to ensure no degradation in services, at the appropriate level of forecasting expertise. These labor categories map to those described in our Technical Response.

Figure 3-3: Staffing

Location	Staffing
CWSU North	1 Branch Chief (GS-15) 1 Aviation Liaison Officer (training/outreach) (GS-14) 5 Senior Forecasters (GS-14) 13 Forecasters (GS-13)
CWSU South	1 Branch Chief (GS-15) 1 Aviation Liaison Officer (training/outreach) (GS-14) 5 Senior Forecasters (GS-14) 13 Forecasters (GS-13)
AWC CWIP	Additional 5 CWIP Forecasters (GS-14)
Anchorage*	1 MIC (GS-13) 3 Forecasters (GS-12)
NWS Headquarters	Quality Assurance Manager (GS-14)
Total staffing	50 FTE

* The Anchorage CWSU will not undergo any changes; the information is provided for staffing totals.

The new CWSU Services model represents a decrease from 84FTEs to 50FTEs - a 34 FTE net reduction. A key element to our approach involves retaining existing personnel, thereby minimizing personnel transition time. The specific staffing changes required in this business model are noted in **Figure 3-4**.

Figure 3-4: Staffing Adjustments for the New CWSU Services Model

Position	FTE
Starting FTEs	84
Less Retirements as Scheduled	-26
Resignation or Reassignment	-13
Subtotal Forecasters (1)	45
Add: Branch Chief	2
Add: Aviation Liaison Officer	2
Add: Quality Assurance Manager	1
Total staffing	50

The NWS will continue to provide the CWSU program with highly skilled personnel possessing the knowledge and experience needed to support the critical nature of aviation weather forecasting. Beyond briefing the FAA, meteorologists are responsible for decisions related to weather forecasts.

The new forecast positions at the two CONUS CWSUs will be GS-13/14. This is in line with the current grade structure at the AWC for forecasters performing similar duties.

NWS compared our rates to those in private industry to substantiate our pricing model and to provide assurances that the most robust solution was implemented. Surveys used include the 2008 Compensation Survey published by the Economic Research Institute (ERI) supporting the National Capital Area. All of the NWS proposed salaries fall within these commercial salary parameters. **The NWS believes that any further reduction in salaries would be at the expense of experience levels or shortfalls in staffing—both impacting safety and efficiency of the NAS.** The results of comparison to existing staffing and commercial pricing indicate that the proposed compensation levels reasonable, competitive, and fair.

Premium Pay

The NWS relies on the ability to staff multiple shifts 16 hours to 24 hours per day, 7 days per week. Overtime, holidays, Sundays, and night shifts are all required to fulfill this mission. The NWS has incorporated the premium pay rates against base pay, as presented in **Figure 3-5**.

Figure 3-5: Premium Rates Applied

Premium Rate	% of Base Pay
Overtime	1.65%
Sunday	2.9%
Holiday Differential	2.5%
Night Differential	2.2%
Awards Premium	1.5%

The NWS also maintains an award pool for its CWSU staff. This pool is accrued as 1.5% of base pay. An annual award is made against this pool based on accomplishing CWSU program objectives. The NWS will incorporate the performance objectives associated with this CWSU Services model to ensure that results align closely to program objectives, and that excellent performance is rewarded accordingly.

Productive Hours

The NWS used 1,758 hours per year throughout the cost volume as the basis for productive hours per employee. For all employees, a base period of 2,087 hours was used in accordance with Section 15203(a) of the Consolidated Omnibus Budget Reconciliation Act of 1985 (Public Law 99–272). Productive hours are computed by taking 2,087 total hours less 329 annual leave, Federal holidays, sick leave, and administrative leave hours charged to overhead. This resulted in 1,758 productive hours per year/employee. This also reduced the GS pay scale salary by a factor of .842 (1,758 productive hours divided by 2,087 total possible hours) to avoid double counting indirect costs already included in overhead.

The proposed productive work hours per person is an average; a particular individual may work fewer or more hours depending on their use of comprehensive leave, NWS-provided training activities charged to overhead, and miscellaneous non-productive hours.

Labor Escalation

The NWS used a labor escalation rate of 3% in calculating its multi-year labor rates for this proposal. Salary escalations were based on OMB recommendations. Specifically, the economic assumptions for the FY 2008 Budget indicated that in preparing budget requests for the FY 2009 Budget, agencies should use 3.0% as their provisional estimate of the pay raise for January 2009. This assumed pay raise will apply to the statutory pay systems (General Schedule, Foreign Service, and Veterans Health Administration). The pay raises encompass both the national schedule adjustment and locality pay without assumption as to how the total increase will be distributed between the two.

All rates were consistently escalated at this rate throughout the period of performance based on a January 1 salary increase date. Base year labor was forecast using the 2009 GS Salary Tables as published by the U.S. Office of Personnel Management and adjusted for productive hours as described above.

Indirect Rates

In developing this proposal, the NWS used indirect rates developed in accordance with agency-wide standard accounting and cost estimating practices. Rates used are based on the FY 2008 target rate structure. Rates are largely determined by region and have been applied to this cost response based on the location of each CWSU proposed. **Figure 3-6** presents the overhead rates used.

Figure 3-6: Indirect Rates Applied

Overhead Rate	Description	Range
Leave Surcharge	Leave pools to accumulate paid time off for annual, administrative, and sick leave determined by region are applied to base labor.	18.69%-19.50%
Employer's Contribution	Similar to a fringe pool to capture benefits and taxes determined by region and applied to base labor.	27.09%-28.51%
NOAA Support	Agency-wide rate reflecting operating support related to labor, travel, training, telecommunication, and similar support functions. This rate is applied to base labor, premium time, and employer's contribution.	22.07%
Line Office Support	Costs associated with NOAA's line offices are captured and applied to labor and leave costs.	10.00%
Financial Management Center (FMC)	Costs of financial and accounting support services determined by region are applied to labor and leave costs. This rate is applied to base labor, premium time, and employer's contribution.	1.8%-15.6%
GSA Facility Rate	NOAA-mandated rate for facility usage. This rate is applied to base labor, premium time, and employer's contribution.	3%

3.2 Reimbursable Cost Recovery

Following the same approach as in the current NWS-FAA IA, the NWS will provide CWSU services based solely on cost. As an agency-to-agency initiative, profit is not applied in this Cost Response. Only the actual costs incurred will be reimbursed.

3.3 Travel

Each site received a travel budget of $2,500 per month to accommodate travel associated with annual system maintenance, training, and site visits. This translates into an estimated $30,000 per year for both CONUS CWSUs. The travel budget was established at the estimated start date in July 2011 for CWSU-South (at the AWC) and August 2011 for CWSU-North (College Park, MD). In addition, a travel budget of $5,000 was established for CWSU-Anchorage (Alaska) per year commencing in the second contract year.

The resulting travel cost is broken down by Base Year, as presented in **Figure 3-7**.

Figure 3-7 Travel Costs by Site by Year

CWSU	2009	2010	2011	2012	2013	Total Base
CWSU-South	$0	$0	$15,000	$30,000	$30,000	$75,000
CWSU-North	$0	$0	$12,500	$30,000	$30,000	$72,500
CWSU-Anchorage	$0	$0	$5,000	$5,000	$5,000	$15,000
Total Travel	$0	$0	$32,500	$65,000	$65,000	$162,500

3.4 Technology Implementation

The FAA will receive the full benefit of the NWS infrastructure in supporting the safety and efficiency of the NAS. The NWS has already spent approximately $1 billion in developing this advanced capability; we have priced only the new hardware and software costs associated with standing up the new CWSU Services and deploying the new weather support products. With the partnership between the NWS and the FAA focused on cost pass-through, the full benefit of this significant intellectual property investment will be realized by the FAA.

The CWSUs will incorporate the NWS National Center Advanced Weather Interactive Processing System (NAWIPS) as a key element to their technology evolution. NAWIPS will provide CWSU staff with the full capability of the NWS to integrate weather analysis and provide improved communication capability. Specifically, the CWSUs will share in the NWS's evolution to realize a greater use of cutting-edge technology. The NAWIPS technology will be purchased in the initial months of the program and utilized by the DemVal team in evaluating and validating operations. The systems will then be deployed for operational use at the new CWSUs as they are stood up. The initial NAWIPS technology investment is estimated at $115,200. A list of the required equipment is provided in Section 3.0, Transition.

Once the new CWSU Services model is launched, the CWSUs will be outfitted with additional equipment. A key upgrade will be the introduction of the AWIPS II systems forecast for 2012. This will coincide with the timing of the hardware refresh of the NAWIPS cost included in the transition plan and replace the NAWIPS solution. **Figure 3-8** summarizes the equipment included at each CWSU for AWIPS II and other hardware.

Figure 3-8: Required Equipment List

Product	Site	New Equipment	Total Cost
PC Workstation	HQ	1 PC workstations for QA Manager	$1,800 (1 * $1,800 per PC)
Monitors	CWSU-South	Center receives 1 video display monitor	$2,000 One-Time Cost
Monitors	CWSU-North	Center receives 1 video display monitor	$2,000 One-Time Cost
Desks	CWSU-North	4 Desk Systems for AWIPS II	$30,804 (4 * $7,701 per system)
Desks	CWSU-South	4 Desk Systems for AWIPS II	$30,804 (4 * $7,701 per system)
CWIP	CWSU-South	1 CWIP System for AWIPS II	$7,701 (1 * $7,701 per workstation)
Spares	CWSU-North	2 Spare System for AWIPS II	$15,402 (2 * $7,701 per workstation)
Spares	CWSU-South	2 Spare System for AWIPS II	$15,402 (2 * $7,701 per workstation)
Developer	CWSU-South	1 Developer Station	$4,863 (1 * $4,863 per workstation)
CWSU-South System	CWSU-South	2 AWC Systems	$12,031 (2 * $6,015.50 per workstation)
CWSU-North System	CWSU-North	2 AWC Systems	$12,031 (2 * $6,015.50 per workstation)
Installation	CWSU-South	Hardware & Software Installation of AWIPS II	$24,617 (1 * $24,617 per workstation)
Installation	CWSU-North	Hardware & Software Installation of AWIPS II	$23,110 (1 * $23,110 per workstation)
		Grand Total	**$182,565**

Figure 3-9 summarizes AWIPS II and equipment costs by year.

Figure 3-9: AWIPS II Costs by Year

Equipment	2009	2010	2011	2012	2013	Total Base
Large Screen Display	$0	$2,000	$2,000	$0	$0	$4,000
PC for Headquarters QA Manager	$0	$0	$1,800	$0	$0	$1,800
AWIPS Hardware	$0	$0	$0	$129,038	$0	$129,038
Installation and Support	$0	$0	$0	$47,727	$0	$47,727
Total Equipment & Support	$0	$2,000	$3,800	$176,765	$0	$182,565

3.5 Recurring Support and Amortized Tech Refresh

Once the AWIPS II solution is implemented, a technology refresh program and software technical support function will be charged out per year. This maintenance plan will cover all future costs associated with supporting the specified infrastructure as itemized for AWIPS II in Figure 3-8 and will begin in the contract year after the initial AWIPS II cost is incurred. In the proposal, AWIPS II installation will occur in 2012 with maintenance beginning in 2013.

Costs included as recurring fees are included per site, as presented in **Figure 3-10**.

Figure 3-10: AWIPS II Recurring Support Costs

Site	New Equipment	Annual Cost
CWSU-South	Amortized Tech Refresh	$17,700
CWSU-South	Software & Hardware Support Fees	$8,225
CWSU-North	Amortized Tech Refresh	$14,560
CWSU-North	Software & Hardware Support Fees	$8,225
Total	Annual Support Beginning Contract Year 5	$48,710

Figure 3-11 summarizes costs by year.

Figure 3-11: Summary Costs by Year

Description	2009	2010	2011	2012	2013	Total Base
Amortized Tech Refresh AWIPS	$0	$0	$0	$0	$32,260	$32,260
O&M Labor & Fee	$0	$0	$0	$0	$16,450	$16,450
Total Recurring Equipment Cost	$0	$0	$0	$0	$48,710	$48,710

3.6 Training

The NWS will develop the training program, including instructor-led content and a robust selection of Computer Based Training (CBT) training programs, as discussed in the Technical Response in Section 3.8. To maintain the training library, dedicated Aviation Liaison Officers (ALO) will continue post-transition to support ongoing training needs. Further, a recurring budget is included to support site visits for ARTCC training at 20 trips per year with a $1,500 per-trip cost, or $30,000 annual recurring cost commencing in Contract Year 2. An additional annual budget of $20,000 was established to cover CBT refresh, resulting in a total annual training budget of $50,000 in addition to ALO staff cost. The NWS Training Branch established an annual training budget. **Figure 3-12** presents a summary of training cost by contract year.

Figure 3-12: Summary of Training Costs by Year

Description	2009	2010	2011	2012	2013	Total Base
NWS Training Branch	$0	$0	$50,000	$50,000	$50,000	$150,000
Total Training Cost	$0	$0	$50,000	$50,000	$50,000	$150,000

3.7 Web Collaboration

The NWS will use interactive on-line collaboration tools to deliver 24/7 on-demand briefings and other ad-hoc communications from the CWSUs to the FAA. The NWS will evaluate and select the collaboration tool. For estimation purposes, the NWS priced WebEx since it is a similar technology. Use of flexible "white-boarding" capability will facilitate collaboration, along with traditional voice communications and instant messaging. The estimated annual cost of online collaboration totaled $20,000 per year per CWSU, commencing in Contract Year 3. An estimated escalation of 3% was applied to annual cost. **Figure 3-13** presents a summary of costs by year by CWSU.

Figure 3-13: Summary of Costs by Contract Year by CWSU

Description	2009	2010	2011	2012	2013	Total Base
CWSU-South	$0	$0	$5,000	$10,000	$10,296	$25,296
CWSU-North	$0	$0	$4,165	$10,296	$10,608	$25,069
Total Web Collaboration	$0	$0	$9,165	$20,296	$20,904	$50,365

3.8 IT Support

To ensure that our systems remain highly responsive and perform optimally, the NWS has established a budget for ongoing IT support resources. Support will commence with system stand-up at the CWSUs, post DemVal. Resources were estimated at 1 FTE for both CWSUs, commencing in July 2011. Costs were escalated each January by a 3% escalation factor and are summarized in **Figure 3-14**.

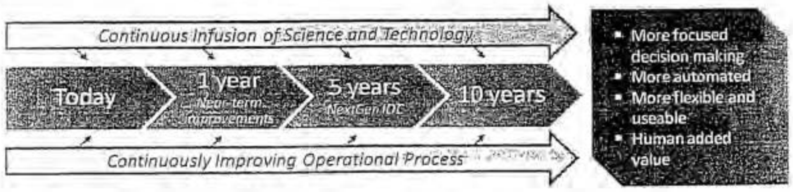
Figure 3-14: Summary Cost Escalations

Description	2009	2010	2011	2012	2013	Total Base
CWSU (North and South) IT Support	$0	$0	$162,180	$343,824	$364,452	$870,456
Total IT Support	$0	$0	$162,180	$343,824	$364,452	$870,456

3.9 Product and Service Improvement Development

The NWS envisions additional customization, ongoing development, and enhancements as the CWSU Services program evolves. We expect that the new CWSU products and services will undergo continuous refinement as we transition toward NextGen in the next 5-10 years. The anticipated advances in the science and technology underpinning aviation weather support will enable evolution of CWSU products and services. **Figure 3-15** depicts our projected timeline to incorporate these advances in science and technology, bringing the NWS fully on board in the NextGen era.

Figure 3-15: Science and Technology Timeline



In support of continued development, the NWS Headquarters established a budget for continued development, as presented in **Figure 3-16**.

Figure 3-16: NWS HQ-Established Budget for Continued Development

Description	2009	2010	2011	2012	2013	Total Base
CWSU North and South R&D	$0	$0	$211,998	$449,436	$476,400	$1,137,834
Total Development	$0	$0	$211,998	$449,436	$476,400	$1,137,834

Costs are expected to begin in July 2011 and are priced at the rate of 2 FTEs. An annual escalation of 3% is applied to costs annually.

3.10 Facilities

Facility modifications for the new CWSUs, and a Quality Management function at NWS HQ, are included in the Technical Response, Section 3.0, Transition. Once modified, ongoing operations include a GSA-mandated rental rate. This rate is the equivalent of 3% on base labor, incentive pay, and leave surcharge.

Total facility cost per CWSU per year is included in the schedule presented in **Figure 3-17**. The rate applies to NWS facilities. As a result, the CWSU-Anchorage reflects no additional facility charges.

Figure 3-17: Total Facility Cost Per CWSU Per Year

Description	2009	2010	2011	2012	2013	Total Base
CWSU-South	$0	$0	$43,107	$88,802	$91,466	$223,375
CWSU-North	$0	$0	$30,675	$75,830	$78,105	$184,610
QAM	$0	$0	$2,025	$4,172	$4,296	$10,493
Total Facility Cost	$0	$0	$75,807	$168,804	$173,867	$418,478

4.0 Transition Plan

4.1 Background

The NWS has developed a transition schedule that carefully identifies, evaluates, and mitigates technical risks associated with the transition to the new CWSU Services model. To that end, the transition is contingent upon a successful DemVal.

After independent evaluation of the DemVal, we anticipate FOC by July 2012. The main schedule drivers are the development of new tools and capabilities, the comprehensive DemVal to evaluate and validate system performance, and personnel processes to bid and fill new positions. The NWS feels that our proposed transition schedule both mitigates transition risks and assumes close coordination between NWS and FAA.

As part of our transition approach, we have minimized risks to continuity of operations and emphasized retention of highly skilled staff. We will ensure full continuity of service as we implement new program requirements and transition our staff to the new service model.

With the key shift in CWSU structure, and the new technologies and services to be implemented, the NWS's transition schedule and associated costs are realistic. Thus, our transition plan focuses on critical NWS operational responsibilities and continuity of service throughout a well-integrated move to the new business model. Our transition risk is minimal: it avoids staff disruption where possible, maximizes retention by applying effective handoff approaches of management and fiscal responsibility, enables open and timely communication with all stakeholders, and requires thorough planning of schedules and milestones associated with all transition activities.

4.2 Transition Resources

Figure 4-1 provides a summary of costs by major category of transition cost. Each cost is then discussed in the following sections.

Figure 4-1: Summary of Transition Cost

Category	2009	2010	2011	2012	Total
3.2.1 Transition Management	$1,129,722	$1,299,792	$847,122	$158,208	$3,434,844
3.2.2 DemVal	$1,020,570	$2,082,755	$213,132	$0	$3,316,457
3.2.3 Relocation, Retirement, Separation	$0	$140,000	$1,091,392	$127,008	$1,358,400
3.2.4 Staff Transition	$0	$0	$831,350	$845,838	$1,677,188
3.2.5 Training	$475,000	$0	$0	$0	$475,000
3.2.6 Technology Adaptation	$1,915,200	$450,000	$0	$0	$2,365,200
3.2.7 Facilities	$75,976	$43,452	$19,356	$12,544	$151,328
Total	$4,616,468	$4,015,999	$3,002,353	$1,143,598	$12,778,418

4.2.1 Transition Management

The NWS will deploy a dedicated transition team immediately after proposal acceptance to ensure a successful transition. The team will comprise seasoned transition management, including an AWC Director, a Transition Manager, a QA Manager (QAM), DemVal Support, Technical Support, Product Development Support, and Transition/Project Management Support personnel. Each position begins January 2009 and extends through transition completion in August 2012, with the exception of the QAM. This position commences in April 2009 and extends through June 2011.

The NWS will contribute the cost of the AWC Director to this effort. Transition team members will be traveling throughout the process. A travel budget of $210,594 was developed based on 60 trips, or 3 trips per month, at $2,200 estimated cost per trip to cover airfare, hotel, per diem, and car rental A breakdown of costs is included in the cost schedule in Section 5, WBS 2.1.

4.2.2 DemVal

Prior to commencing the transition, the NWS will conduct a 9-month DemVal that will be fully evaluated, verified, and validated by independent parties from Government and private industry. Given the safety impact of services and resulting requirement for service level continuity, it is critical that a comprehensive development and evaluation plan be implemented.

The staff members identified in **Figure 4-2** will oversee the DemVal. These additional resources will ensure evaluation and refinement of new products, services, and processes without disrupting the current service.

Figure 4-2: Staffing by Position for the DemVal

Position	FTE	Duration
Branch Chief	1	Sept 2009 – June 2011
ALO	1	Sept 2009- June 2011
Forecasters for CWSU	5	Oct 2009- Dec 2010
Forecasters for CWIP	2	Oct 2009- Dec 2010
ITO	1	Mar 2009 – Oct 2010
Total staffing	10	

Once the 9-month DemVal is deemed successful by independent evaluators, and the FAA and NWS agree to move forward, the DemVal team members will move to CWSU transition support. The Branch Chiefs and ALOs will ready their new CWSUs; the forecasters will be available for augmentation support to CWSUs that realize attrition due the model change.

The independent evaluators will travel to monitor progress on the DemVal. The cost of their time and travel is estimated at $200,000 for this effort.

The total costs of the DemVal are estimated at $3,256,823. Details are included in Section 5, WBS 2.2.

4.2.3 Relocation, Retirement, and Reassignment

Inevitably, there will be staff movements between CWSUs as a result of hiring staff, retirements, and resignations. The existing overhead pools will accommodate much of the costs of hiring staff, along with leave payout associated with retirement.

Currently, 29 staff members are eligible for retirement. The NWS anticipates that 90% of eligible staff will elect to retire. Of this number, 5% would be accommodated in the overhead structure, leaving 25 staff members retiring with additional cost. For these staff members, the NWS will recognize lump sum leave payout of $12,000 per employee, resulting in $300,000 in retirement costs. We also estimate that 13 existing staff members are eligible for reassignment.

Additional costs will be incurred to the extent that relocations are required. The NWS assumes that new CWSU positions will be filled through existing weather service personnel who elect to relocate. The new CWSU Services model assumes 46 staff changes, with 60% of these additions requiring relocation, resulting in 28 relocations priced in the transition plan.

The NWS used the mid-point between 2007 costs reserved for relocation and costs after credits for actual expense as its estimate for relocation cost. This amount totaled $37,800 per relocation overall for the NWS. At 28 relocations, the transition plan incorporates $1,058,400 in relocation expenses.

4.2.4 Staff Transition

To facilitate the stand-up of new locations and the stand-down of existing locations, a team of 5 forecasters is scheduled from June 2011 through July 2012. With the focus on maintaining full existing CWSU service levels after the DemVal, but before FOC, this team will be available to backfill slots lost either through attrition or through relocation of staff to existing CWSUs. Since stand-up of new CWSUs and stand-down of legacy CWSUs will be staggered, this team will be able to accommodate coverage of two CWSUs simultaneously over the course of the migration. The tentative overall schedule for center migration is included in **Figure 4-3**.

Figure 4-3: Staff Transition Summary

	Aug 2011	Sept-2011	Oct 2011	Nov 2011	Dec 2011	Jan 2012	Feb 2012	Mar 2012	Apr 2012	May 2012	June 2012	July-2012
Legacy	80	72	68	60	48	48	32	20	12	8	4	4
CWSU- South	12	17	17	22	22	25	25	25	25	25	25	25
CWSU-North	7	7	7	12	12	17	17	20	20	20	20	20
QAM	1	1	1	1	1	1	1	1	1	1	1	1
Total FTEs	100	95	93	95	83	91	75	66	58	54	50	50
Number of Legacy CWSUs/ Reductions	1	2	1	2	3	0	4	3	2	1	1	0

The cost of this service level is estimated at $1,660,532 for the transition. Cost comprises labor of $964,732 for the 5 staff members and travel of $695,800. Travel was estimated at 1 trip per month with the staff member remaining onsite during the month. Total trips were estimated at 55 (1 per month per 5 staff members over 11 months). Each trip included airfare, along with a month of per diem, hotel, and rental car for an average trip cost of $9,940. The cost breakdown of staff and travel is reflected in WBS 2.3.4, Transition Labor.

4.2.5 Training

The NWS has incorporated an expanded training program in its new CWSU Services model. The plan will provide instructor-led training, in addition to a robust CBT curriculum.

Online training modules provide flexibility and convenience. Training is mandatory; however, personnel can train on their own time and at their own pace. In addition, the NWS will make all training modules available to the FAA. Modules will provide helpful information to air traffic personnel in their understanding of both weather-related issues and to ensure that they fully understand the enhanced technology that will be offered through the CWSUs. **Figure 4-4** summarizes the CBT Training Curriculum costs, and the following paragraphs provide brief overviews of the courses.

Figure 4-4: CBT Training Curriculum Cost

Module	Cost
Change Management/Orientation	$80,000
Local Knowledge	$50,000

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00263 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Module	Cost
Proactive Communications	$40,000
Customer Service/Customer Needs	$40,000
Technology	$195,000
Concept of Product Use	$70,000
Total	$475,000

Change Management/Orientation

- **Objective:** Understand new business model operations in weather support context, chain of command interrelationships of the AST, and expectations associated with new way of doing business. This course defines the roles/responsibilities and the operation of the new business model.
- **Cost:** This 2-hour webcast module is estimated at $80,000 to include $70,000 for the development and production, along with $10,000 of Subject Matter Expert (SME) travel.

Local Knowledge

- **Objective:** Provides local forecast knowledge from the WFO, as well as knowledge on how weather impacts traffic at the local ARTCCs.
- **Cost:** This module is estimated at $50,000 for 4 months of development time.

Proactive Communications

- **Objective:** Skills to utilize high tech innovative communication tools and weather products while maintaining trusted relationships with FAA.
- **Cost:** Remote Briefings with Proactive information provided by CWSU staff that will reengineer "Situational Awareness" briefings (adapted from Aviation Weather Operations Course [AWOC] modules) is estimated to cost $40,000. Costs will include $10,000 to revise AWOC modules, $20,000 for simulated briefings and $10,000 for resource gathering on remote briefings (from Navy, AF, SR, etc)

Customer Service/Customer Needs

- **Objective:** Customer service skills that are designed to ensure continuity of service from remote locations will be discussed. Content will reinforce fluency in FAA language to ensure on-target oral and written communications.
- **Cost:** Reuse of the LMS existing SkillSoft courses on the basics of customer service would be combined with new development related to communications with the FAA, resulting in a total cost estimates of $40,000. Costs would include interfacing with FAA SME(s) and collaboration with the FAA Academy. Travel of $10,000 is included in the course estimate. Additional recurring costs were estimated in the Headquarters training budget of $30,000 for travel associated with instructor-led refresher training.

Technology

- **Objective:** Step- by-step instruction on use of the new systems and technologies deployed at CWSU and FAA facilities. The CWSUs will receive in-depth NAWIPS and AWIPS II training related to system use and new applications.

- **Cost:** Costs include a distance learning module developed for FAA employees to interact and learn about CWSU products. The development budget of $195,000 includes: $20,000 for AWIPS- System Administration training, $30,000 for CWSU Forecasters training on Introduction to Forecasting in AWIPS, $70,000 for CWSU Staff on CWSU Center Pre-Commissioning - CWSU Center Operations Course, $25,000 for Major FAA ARTCCs – Obtaining and using CWSU Products – On site Training (Technology), and $50,000 for Obtaining and using CWSU Products (Technology)

Concept of Product Use

- **Objective:** Provides FAA personnel with a user-friendly guide to CWIP (Collaborative Weather Impact Product) and application to FAA decision making operations.
- **Cost:** A budget of $70,000 was developed for this 2-hour module. Cost assumes that SME resources will be consulted and access to developed COMET material would be available.

The NWS will collaborate with partners to develop training content and ensure mission coverage. Groups that are envisioned to contribute include: AWC, FAA Academy, SRH, FAA, and DoD (Navy, Air Force). Training will be developed in months 2 through 7 of the transition schedule. Costs will be incurred for travel to sites, development of web-based training and online training session material. Costs for instructor-led delivery and travel will continue through transition and are incorporated for reinforcement training in CWSU site costs. The cost of developing training material is captured in Section 5, WBS 2.4. The cost of training delivery is incorporated in WSB 2.2.1.2.

4.2.6 Technology Adaptation

The NWS will dramatically transform its aviation weather support for the CWSUs. In addition to a robust technology platform, the NWS will integrate new products and communication capabilities. A Product Development Team, consisting of contractor personnel, will support the software development and testing of three new capabilities: CWIP and TRACON forecast development, remote briefing capability, and interactive online web-collaboration.

The cost model incorporates staffing from March 2009 to June 2010 for product development. Development cost is estimated at $2,250,000, as included in WBS 2.5 of the Cost Schedule. The cost estimates are based on the following:

- **CWIP:** The final CWIP platform will be determined early in the development period, and will likely involve limited NAWIPS development and modification. Other CWIP development (display and modification) will be integrally tied to the CWSU Web Portal discussed below. Modification costs are spread throughout the DemVal Period. Cost comparables for CWIP develop are estimated on the AWC development of the Graphical AIRMET product.
- **CWSU Web Portal:** Rapid upfront development will be necessary to develop the CWSU Web Portal prior to the DemVal. As described in the Technical Section, the CWSU Web Portal will allow access to all CWSU Products and Services, including the CWIP and TRACON forecast, Remote Briefings, and other interactive communication tools. Modification costs are spread throughout the DemVal period. Cost comparables for the CWSU Web Portal are estimated from the National Center of Atmospheric Research's development of the Aviation Digital Data Services (ADDS).

- **Interactive On-Line Web Collaboration:** Rapid upfront development of an appropriate interactive on-line web collaboration tool, accessible through the CWSU Web portal, is needed prior to initiation of the DemVal. Cost comparables for this development are roughly estimated on costs of similar technologies.

The cost of the NAWIPS platform is included in the transition plan. The NWS envisions the migration to AWIPS II post-transition. The upgraded cost of this future capability is included in the new CWSU costs per Section 5, WBS 2.5.2.

Included in the transition plan is the initial cost of the NAWIPS platform. This cost of $115,200 is forecast in January 2009. The platform will initially be used by the DemVal team and will transition to the CWSUs post testing and approval. Budgets include the initial NAWIPS equipment identified in Figure 4-5.

Figure 4-5: Equipment List: The NWS Will Provide Equipment at Each Site

Product	Site	New Equipment	Total Cost
NAWIPS	CWSU-North	6 NAWIPS workstations (4 monitors at each station)	$36,000 (6 * $6,000 per workstation)
NAWIPS	CWSU-South	6 NAWIPS workstations (4 monitors at each station)	$36,000 (6 * $6,000 per workstation)
Briefing PCs	CWSU-North	6 Briefing PCs (2 monitors at each station)	$18,000 (6 * $3,000 per PC)
Briefing PCs	CWSU-South	6 Briefing PCs (2 monitors at each station)	$18,000 (6 * $3,000 per PC)
PC Workstation	CWSU-North	2 PC workstations for Branch Chief and ALO	$3,600 (2 * $1,800 per PC)
PC Workstation	CWSU-South	2 PC workstations for Branch Chief and ALO	$3,600 (2 * $1,800 per PC)
	Subtotal	**Deployed as part of transition to be used by DemVal then transferred to CWSUs**	**$115,200**

4.2.7 Facilities

The new CWSU Services model will maintain locations at both the NCEP in College Park, MD (CWSU-North) and the NWS's Aviation Weather Center in Kansas City, MO (CWSU-South). Both sites will be modified to accommodate additional staff members as well as core components of the technology solution. Since both sites contain state-of-the-art communication levels, facility modification will be minimal and is estimated at $50,000: $40,000 for the CWSU-South and $10,000 at the CWSU-North.

The NWS site carries a NOAA-mandated GSA overhead rent. This rent will be applied at the rate of 3% to base labor, shift premiums, and leave surcharge. This rate was applied to the related transition costs and totals $101,328 over the transition period.

5.0 Cost Schedules

The following cost schedules reflect program costs for the continuation of existing CWSU services, the transition costs to the new CWSU Services model and ongoing operations in the new model. At the lowest level, costs are developed by location by month based on a program WBS. This WBS was forecast out monthly over a 5-year proposed IA period. The following pages contain annual cost summaries with monthly schedules provide on the accompanying CD.

Figure 5-1: Annual Summary Cost Schedule

		Year 1	Year 2	Year 3	Year 4	Year 5	Total for 5 Years
1	Operations	$12,283,836	$12,650,748	$16,526,945	$12,366,153	$10,971,413	$64,799,095
1.X	All Locations	$12,283,836	$12,650,748	$16,526,945	$12,366,153	$10,971,413	$64,799,095
1.X.1	Staff Labor	$12,233,436	$12,600,348	$15,933,095	$11,084,828	$9,772,080	$61,623,787
1.X.2	Travel	$50,400	$50,400	$78,900	$72,208	$65,000	$316,900
1.X.3	Training	$0	$0	$50,000	$50,000	$50,000	$150,000
1.X.4	Equipment & Installation	$0	$0	$5,800	$176,765	$0	$182,565
1.X.5	Recurring Support and Amort Tech Refresh	$0	$0	$0	$0	$48,709	$48,709
1.X.6	Other Direct Cost	$0	$0	$383,343	$813,556	$861,756	$2,058,655
1.X.7	Facilities	$0	$0	$75,807	$168,804	$173,868	$418,479
2	Transition	$4,616,468	$4,015,999	$3,002,353	$1,143,598	$0	$12,776,418
2.1	Transition Management	$1,129,722	$1,299,792	$847,122	$158,208	$0	$3,434,844
2.1.1	NWS Labor	$179,388	$206,772	$167,652	$84,000	$0	$637,812
2.1.2	Indirect Cost	$158,484	$182,700	$148,110	$74,208	$0	$563,502
2.1.3	Contractor Cost	$725,850	$828,744	$468,342	$0	$0	$2,022,936
2.1.4	Travel	$66,000	$81,576	$63,018	$0	$0	$210,594
2.2	DemVal	$1,020,570	$2,082,755	$213,132	$0	$0	$3,316,457
2.3	Staff Transition	$0	$140,000	$1,922,742	$972,846	$0	$3,035,588
2.4	Training	$475,000	$0	$0	$0	$0	$475,000
2.5	Technology Adaption & IT	$1,915,200	$450,000	$0	$0	$0	$2,365,200
2.6	Facilities	$75,975	$43,452	$19,357	$12,544	$0	$151,328
Grand Total		$16,900,304	$16,666,747	$19,529,298	$13,509,751	$10,971,413	$77,577,513

Figure 5-2: Summary: Annual Cost Schedule for the New CWSU Services Model

1	Remote CWSU Model	Year 1	Year 2	Year 3	Year 4	Year 5	Total for 5 Years
1.X	**All Locations**	$0	$0	$4,834,052	$10,761,541	$10,971,413	$26,567,006
1.1.1	**Staff Labor**	$0	$0	$4,286,602	$9,487,416	$9,772,080	$23,546,098
1.X.1.1	Management	$0	$0	$198,340	$447,444	$460,850	$1,106,644
1.X.1.1.1	Branch Chief (GS15)	$0	$0	$107,202	$241,848	$249,096	$598,146
1.X.1.1.2	Aviation Liason Officer (GS14)	$0	$0	$91,138	$205,596	$211,764	$508,498
1.X.1.2	Quality	$0	$0	$51,996	$107,112	$110,378	$268,436
1.X.1.2.1	Quality Assurance Meteorologist (GS13)	$0	$0	$51,996	$107,112	$110,328	$269,436
1.X.1.3	Operation	$0	$0	$1,853,470	$4,103,844	$4,226,964	$10,184,278
1.X.1.3.1	CWIP Forecaster (GS14)	$0	$0	$239,034	$492,420	$507,192	$1,238,646
1.X.1.3.2	Forecaster (GS14)	$0	$0	$455,689	$1,027,992	$1,058,832	$2,542,513
1.X.1.3.3	Forecaster (GS13)	$0	$0	$1,046,931	$2,353,092	$2,423,688	$5,823,711
1.X.1.3.4	Forecaster (GS12)	$0	$0	$111,816	$230,340	$237,252	$579,408
1.X.1.4	Total Premium Pay	$0	$0	$226,162	$500,760	$515,832	$1,242,754
1.X.1.4.1	Awards	$0	$0	$31,555	$69,876	$71,976	$173,407
1.X.1.4.2	Overtime	$0	$0	$34,709	$76,860	$79,188	$190,757
1.X.1.4.3	Sunday	$0	$0	$61,006	$135,084	$139,164	$335,254
1.X.1.4.4	Holiday Differential	$0	$0	$52,600	$116,448	$119,952	$289,000
1.X.1.4.5	Night Differential	$0	$0	$46,292	$102,492	$105,552	$254,336
1.X.1.5	Indirect Cost	$0	$0	$1,956,634	$4,326,256	$4,458,096	$10,742,986
1.X.1.5.1	Leave Surcharge	$0	$0	$401,083	$888,120	$914,760	$2,203,963
1.X.1.5.2	Employer's Contribution	$0	$0	$588,466	$1,300,176	$1,339,164	$3,227,806
1.X.1.5.3	NOAA Support	$0	$0	$602,746	$1,334,640	$1,374,684	$3,312,070
1.X.1.5.4	Line Office Rate	$0	$0	$273,100	$604,728	$622,884	$1,500,712
1.X.1.5.5	FMC	$0	$0	$91,239	$200,592	$206,604	$498,435
1.X.2	**Travel**	$0	$0	$32,500	$65,000	$65,000	$162,500
1.X.3	**Training**	$0	$0	$50,000	$50,000	$50,000	$150,000
1.X.4	**Equipment & Installation**	$0	$0	$5,800	$176,765	$0	$182,565
1.X.5	**Recurring Support and Amort Tech Refresh**	$0	$0	$0	$0	$48,709	$48,709
1.X.6	**Other Direct Cost**	$0	$0	$383,343	$813,556	$861,756	$2,058,655
1.X.6.1	Web Collaboration	$0	$0	$9,165	$20,296	$20,904	$50,365
1.X.6.2	IT Contractor Support	$0	$0	$162,180	$343,824	$364,452	$870,456
1.X.6.3	Product and Service Improvement Development	$0	$0	$211,998	$449,436	$476,400	$1,137,834
1.X.6.4	Other	$0	$0	$0	$0	$0	$0
1.X.7	**Facilities**	$0	$0	$75,807	$168,804	$173,868	$418,479
1.X.7.1	Rental Payments to GSA	$0	$0	$75,807	$168,804	$173,868	$418,479

Figure 5-3: Summary Annual Cost Schedule – Transition

		Year 1	Year 2	Year 3	Year 4	Year 5	Total for 5 Years
2	**Transition**	$4,616,468	$4,015,999	$3,002,353	$1,143,598	$0	$12,778,418
2.1	**Transition Management**	$1,129,722	$1,299,792	$847,122	$158,208	$0	$3,434,844
2.1.1	**Subtotal NWS Labor**	$179,388	$206,772	$167,652	$84,000	$0	$637,812
2.1.1.1	AWC Director	$115,308	$118,764	$122,328	$84,000	$0	$440,400
2.1.1.2	Transition Manager	$115,308	$118,764	$122,328	$84,000	$0	$440,400
2.1.1.3	Quality Assurance Manager	$64,080	$88,000	$45,324	$0	$0	$197,412
2.1.1.4	NWS Contribution	-$115,308	-$118,764	-$122,328	-$84,000	$0	-$440,400
2.1.2	**Subtotal Indirect Cost**	$158,484	$182,700	$148,110	$74,208	$0	$563,502
2.1.2.1	Leave Surcharge	$35,967	$41,460	$33,612	$16,840	$0	$127,879
2.1.2.2	Employer's Contribution	$45,639	$52,608	$42,648	$21,368	$0	$162,263
2.1.2.3	NOAA Support	$48,888	$56,352	$45,684	$22,888	$0	$173,812
2.1.2.4	Line Office Rate	$21,534	$24,828	$20,130	$10,088	$0	$76,580
2.1.2.5	FMC	$6,456	$7,452	$6,036	$3,024	$0	$22,968
2.1.3	**Subtotal for Contractor Cost**	$725,850	$828,744	$468,342	$0	$0	$2,022,936
2.1.3.1	DemVal Support	$162,000	$222,480	$0	$0	$0	$384,480
2.1.3.2	Technical Support	$123,750	$139,056	$107,424	$0	$0	$370,230
2.1.3.3	Product Development Support	$148,500	$166,860	$128,898	$0	$0	$444,258
2.1.3.4	Transition/PM Support	$291,600	$300,348	$232,020	$0	$0	$823,968
2.1.4	**Travel**	$66,000	$81,576	$63,018	$0	$0	$210,594
2.2	DemVal	$1,020,570	$2,082,755	$213,132	$0	$0	$3,316,457
2.2.1	**Subtotal Labor**	$541,852	$999,611	$113,160	$0	$0	$1,654,623
2.2.1.1	Branch Chiefs	$38,435	$118,763	$61,164	$0	$0	$218,362
2.2.1.2	ALO	$32,675	$100,966	$51,996	$0	$0	$185,636
2.2.1.3	CWSU S Forecasters	$285,906	$504,828	$0	$0	$0	$790,733
2.2.1.4	AWC Forecasters	$114,382	$201,931	$0	$0	$0	$316,293
2.2.1.5	ITO at CWSU S	$70,475	$73,123	$0	$0	$0	$143,598
2.2.2	**Subtotal Indirect Cost**	$478,718	$883,144	$99,972	$0	$0	$1,461,834
2.2.2.1	Leave Surcharge	$108,642	$200,420	$22,686	$0	$0	$331,748
2.2.2.2	Employer's Contribution	$137,850	$254,304	$28,788	$0	$0	$420,942
2.2.2.3	NOAA Support	$147,663	$272,410	$30,840	$0	$0	$450,913
2.2.2.4	Line Office Rate	$65,049	$120,008	$13,584	$0	$0	$198,641
2.2.2.5	FMC	$19,514	$36,002	$4,074	$0	$0	$59,590
2.2.3	**External Review Team**	$0	$200,000	$0	$0	$0	$200,000

Figure 5-4: Summary Annual Cost Schedule – Transition Continued

		Year 1	Year 2	Year 3	Year 4	Year 5	Total for 5 Years
2.3	**Staff Transition**	$0	$140,000	$1,922,742	$972,846	$0	$3,035,588
2.3.1	**Relocation**	$0	$0	$931,392	$127,008	$0	$1,058,400
2.3.2	**Retire, Reassign and Resignation Costs**	$0	$140,000	$160,000	$0	$0	$300,000
2.3.2.1	Retirement	$0	$140,000	$160,000	$0	$0	$300,000
2.3.2.2	Reassignment	5	$0	$0	$0	$0	$0
2.3.2.3	Resignation	$0	$0	$0	$0	$0	$0
2.3.3	**Recruiting/Hiring**	$0	$0	$0	$0	$0	$0
2.3.4	**Transition Labor & Travel**	$0	$0	$831,350	$845,838	$0	$1,677,188
2.3.4.1	**Subtotal Transition Labor**	$0	$0	$256,678	$264,376	$0	$521,054
2.3.4.1	Transition Forecasters	$0	$0	$256,678	$264,376	$0	$521,054
2.3.4.2	**Total Indirect Cost**	$0	$0	$226,772	$233,562	$0	$460,334
2.3.4.2.1	Leave Surcharge	$0	$0	$51,464	$53,004	$0	$104,468
2.3.4.2.2	Employer's Contribution	$0	$0	$65,296	$67,256	$0	$132,552
2.3.4.2.3	NOAA Support	$0	$0	$69,951	$72,044	$0	$141,995
2.3.4.2.4	Line Office Rate	$0	$0	$30,814	$31,738	$0	$62,552
2.3.4.2.5	FMC	$0	$0	$9,247	$9,520	$0	$18,767
2.3.4.3	**Travel**	$0	$0	$347,900	$347,900	$0	$695,800
2.4	**Training**	$475,000	$0	$0	$0	$0	$475,000
2.4.1	Change Management/Orientation	$80,000	$0	$0	$0	$0	$80,000
2.4.2	Local Knowledge	$50,000	$0	$0	$0	$0	$50,000
2.4.3	Proactive Communications	$40,000	$0	$0	$0	$0	$40,000
2.4.4	Customer Service/Customer Needs	$40,000	$0	$0	$0	$0	$40,000
2.4.5	Technology	$195,000	$0	$0	$0	$0	$195,000
2.4.6	Concept of Product Use	$70,000	$0	$0	$0	$0	$70,000
2.5	**Total Technology Adaption & IT**	$1,915,200	$450,000	$0	$0	$0	$2,365,200
2.5.1	**Subtotal for Contractor Labor**	$1,800,000	$450,000	$0	$0	$0	$2,250,000
2.5.1.1	CWIP/TRACON Development	$1,250,000	$450,000	$0	$0	$0	$1,700,000
2.5.1.2	Web Portals	$350,000	$0	$0	$0	$0	$350,000
2.5.1.3	Remote Briefing	$200,000	$0	$0	$0	$0	$200,000
2.5.2	**Equipment**	$115,200	$0	$0	$0	$0	$115,200
2.5.2.1	NAWIPS Initial Investment	$115,200	$0	$0	$0	$0	$115,200
2.6	**Facilities**	$75,975	$43,452	$19,357	$12,544	$0	$151,328
2.6.1	Buildout of AWC	$40,000	$0	$0	$0	$0	$40,000
2.6.2	Buildout of College Park	$10,000	$0	$0	$0	$0	$10,000
2.6.3	Rental Payments to GSA	$25,975	$43,452	$19,357	$12,544	$0	$101,328

Figure 5-5: Summary Annual Cost Schedule – Legacy CWSUs Through Phase Out

1	Operations	Year 1	Year 2	Year 3	Year 4	Year 5	Total for 5 Years
1.X	All Locations	$12,283,836	$12,650,748	$11,692,893	$1,604,612	$0	$38,232,089
1.X.1	Staff Labor	$12,233,436	$12,600,348	$11,646,493	$1,597,412	$0	$38,077,689
1.X.1.1	Management	$0	$0	$0	$0	$0	$0
1.X.1.1.1	Branch Chief (GS15)	$0	$0	$0	$0	$0	$0
1.X.1.1.2	Aviation Liason Officer (GS14)	$0	$0	$0	$0	$0	$0
1.X.1.2	Quality	$0	$0	$0	$0	$0	$0
1.X.1.2.1	Quality Assurance Meterologist (GS13)	$0	$0	$0	$0	$0	$0
1.X.1.3	Operation	$6,020,868	$6,201,504	$5,744,014	$791,117	$0	$18,757,503
1.X.1.3.3	Forecaster (GS13)	$1,709,160	$1,760,436	$1,630,540	$224,575	$0	$5,324,711
1.X.1.3.4	Forecaster (GS12)	$4,311,708	$4,441,068	$4,113,474	$566,542	$0	$13,432,792
1.X.1.4	Premium Pay	$647,316	$666,648	$617,443	$85,046	$0	$2,016,453
1.X.1.5	Indirect Cost	$5,565,252	$5,732,196	$5,285,036	$721,249	$0	$17,303,733
1.X.2	Travel	$50,400	$50,400	$46,400	$7,200	$0	$154,400
1.X.3	Training	$0	$0	$0	$0	$0	$0
1.X.4	Equipment & Installation	$0	$0	$0	$0	$0	$0
1.X.5	Recurring Support and Amort Tech Refresh	$0	$0	$0	$0	$0	$0
1.X.6	Other Direct Cost	$0	$0	$0	$0	$0	$0
1.X.6.1	Web Collaboration	$0	$0	$0	$0	$0	$0
1.X.6.2	IT Contractor Support	$0	$0	$0	$0	$0	$0
1.X.6.3	Product and Service Improvement Development	$0	$0	$0	$0	$0	$0
1.X.6.4	Other	$0	$0	$0	$0	$0	$0
1.X.7	Facilities	$0	$0	$0	$0	$0	$0

#11

NOAA

National Weather Service (NWS)

Center Weather Service Unit (CWSU)

Quality Assurance Surveillance Plan (QASP)

Table of Contents

Quality Assurance Surveillance Plan

1.0 Section 1: Introduction

1.1 Purpose

This Quality Assurance Surveillance Plan (QASP) describes the procedures that the Federal Aviation Administration (FAA) and the National Weather Service (NWS) use to monitor and measure performance of the Center Weather Service Unit (CWSU) based upon requirements submitted by the FAA as outlined in the pending FAA-National Weather Service (NWS) Interagency Agreement (IA). Under the direction of the QASP, the FAA makes quantitative and qualitative assessments of overall NWS performance.

The QASP focuses on performance measures regarding the quality, accuracy, and timeliness of CWSU services as well as compliance with specific requirements. Each performance measure reflects a specific outcome that the FAA will use to monitor NWS performance. FAA and NWS quality assurance staff use a combination of surveillance methods such as quality reviews, direct observation, surveys, and document review. Each method of surveillance relies on data from a specified data source. Because the QASP is a living document and will be updated throughout the course of CWSU services, the FAA and NWS will jointly modify the surveillance process as appropriate.

1.2 Relationship to the CWSU Requirements Document

This QASP supplements the CWSU Requirements Document and Quality Management Plan as an advisory document, directing the FAA's process of overseeing NWS performance. It provides for effective and systematic surveillance of CWSU services in accordance with the requirements of the IA.

The QASP acts as a point-in-time, living document that reflects the FAA's current approach to surveillance. The NWS and the FAA will update the QASP to reflect changes to performance measures, surveillance methods, and other facets of the quality assurance process. For purposes of the initial iteration of the QASP, performance measures may depend on metrics gathered during an initial baselining period (per the Quality Management Plan). Over the course of the program life cycle, new metrics may be developed as operational requirements change; these will be incorporated into the quality program.

1.3 Format

The QASP is composed of five sections, as follows:

- Section 1 – Introduction – Provides a broad overview of this QASP;
- Section 2 – Quality Assurance Overview – Describes the overall surveillance approach;
- Section 3 – Roles & Responsibilities of the FAA, NWS, and Users – Identifies key roles and responsibilities in the surveillance process;
- Section 4 – Quality Assurance Execution Strategy – Describes schedule, methods, and reporting process for surveillance of NWS performance; and

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00276 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- Section 5 – Surveillance Adjustments – Describes the impact of NWS performance and CWSU operational environment on increasing or decreasing level of surveillance.

2.0 Quality Assurance Overview

2.1 Introduction

The FAA evaluates CWSU services to ensure that the NWS adheres to the Interagency Agreement (IA) and meets performance measures within the Performance Requirements Summary (PRS), with the ultimate goal of ensuring high-quality, standardized, responsive, and consistent NWS aviation products and services. The PRS (located in Appendix A), which is included with the IA, lays out specific NWS performance measures for particular IA requirements. In discussing quality assurance, the IA, PRS, and the QASP use specific terms defined as follows:

- Performance Measure - An outcome of CWSU service which the agency uses to monitor NWS performance;
- Performance Measure Definition - A description and context for calculating the performance measure;
- Applicable Services - The services to be evaluated using the stated performance measure;
- Acceptable Performance Level (APL) - The quantitative performance level that is acceptable by the FAA for a given performance measure;
- Evaluation Frequency - A standard period when performance is evaluated which is adjustable at the discretion of the FAA;
- Data Source - The primary source(s) of information that is used to calculate performance levels and/or evaluate performance; and
- Surveillance Method - The primary technique or method for monitoring and evaluating performance.

2.2 IA Compliance Oversight

In accordance with standard Federal procedures, the FAA employs a variety of surveillance methods to evaluate NWS adherence to the specific requirements in the IA. The QASP describes the strategy – including roles, responsibilities and approaches – used by the FAA to monitor aspects of IA compliance that are not specifically addressed in the Performance Requirements Summary (PRS). The following section describes how the FAA monitors performance measures within the PRS.

In response to the NWS proposal, the FAA develops an oversight process that considers risk and other factors critical to successful NWS performance. The FAA considers the following criteria when selecting specific requirements for compliance evaluation:

- Criticality to supporting safe and efficient flight;
- User complaints and customer satisfaction survey results;
- Period of IA performance (e.g., Phase-In); and
- Pending or present changes in the CWSU operational environment.

2.3 Performance Requirements Summary

The PRS establishes performance measures corresponding to requirements within the IA. While the NWS is ultimately responsible for the performance and quality of all products and services, the PRS provides a means of comparing the performance outcomes of the NWS to those performance levels determined acceptable by the FAA, known as APLs. The QASP measures the degree to which the accuracy, quality, and timeliness of products and services provided by the NWS conform to APLs established within the PRS.

The PRS is structured to address both organization-wide and service-specific performance. FAA assesses performance results on both national and local levels. Measures included reflect the overall performance goals of the FAA in addition to fulfillment of specific IA requirements. The absence of any IA requirement from the PRS does not detract from its enforceability or limit the rights or remedies of the FAA under any other provisions of the IA.

The measures created are considered primary measures. Primary measures are the main indicators of organizational impact, and provide an overall determination on whether the CWSU is succeeding or failing in its new operational capacity.

The PRS conveys the following information:

- Performance measures that describe the characteristics of outcomes resulting from required tasks;
- APLs the FAA is willing to accept before taking action for unsatisfactory IA performance; and
- The quality assurance methods and sources of data the FAA may use to evaluate the NWS's performance in meeting the performance measures specified.

Depending on the service evaluated and the evaluation method selected, an APL may be stated as a number of occurrences (e.g., number of dropped calls per month = 100) or as a percentage (e.g., percentage of Center Weather Advisories (CWAs) issued when significant weather criteria is forecast or met). An APL of zero deficiencies/errors is appropriate if, in fact, any defect is unacceptable for IA requirements. The NWS's Quality Assurance Manager is notified when performance is marginal or approaching an unacceptable APL.

3.0 Roles and Responsibilities of the FAA, NWS, and Users

3.1 Overview of Key Roles and Responsibilities

The FAA and the NWS are jointly responsible for ensuring that obligations of this IA are met and that the services rendered meet jointly established performance measures within the PRS. The NWS is responsible for meeting IA requirements and performance measures within the PRS through the implementation of internal quality control processes. The FAA's designated Quality representative(s) supports the quality control process by indicating their satisfaction level through formal and informal feedback. These key roles are described further below.

3.2 FAA Responsibility

The Contracting Officer Technical Representative (COTR) and Quality Assurance Evaluator(s) (QAE) represent the key FAA personnel responsible for quality assurance and IA compliance

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00278 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

oversight as described within this document. All communications regarding questions or issues related to quality assurance and reviews are directed to the QAE(s) or COTR.

3.2.1 Contracting Officer (CO)

The CO has the authority to administer the IA.

3.2.2 Contracting Officer's Technical Representative (COTR)

The COTR serves as the day-to-day manager of one, several, or all requirements of this IA including monitoring IA compliance and NWS performance as related to the PRS. The COTR, with CO approval, is responsible for:

- Representing the CO and serving as the NWS's point of contact;
- Determining if the work being performed fulfills the needs of customers in accordance with IA; specifications and conforms with acceptable performance levels within the PRS; and
- Supervising the QAE(s) and ensuring that they properly conduct the QA.

The COTR must inform the NWS of any performance-related problems and recommend actions that should be taken. The COTR will also coordinate with the NWS and the CO on the terms of the IA, including elements related to performance.

3.2.3 Quality Assurance Evaluators (QAE)

QAE(s) play a key role in IA administration. The FAA monitors CWSU performance through the services of QAE(s). The QAE(s) perform the actual IA surveillance and report to the COTR. Some of the key IA administration duties of QAE(s) include the following:

- Conduct surveillance as required by the PRS and make recommendations to the COTR for deficiency notices and/or letters of commendation;
- Assist the COTR in identifying necessary changes to the IA, conducting quality assurance meetings, approving submittals, and maintaining work files;
- Make recommendations to the COTR for the validation of satisfactorily completed work and for administrative actions based on unsatisfactory work and non-performed work;
- Furnish the COTR with any requests for changes, deviations or waivers to the IA; and
- Serve as subject matter experts as requested by Board of Performance and Cost Review (BPCR) as described in Section 3.2.4.

QAE(s) possess no authority to allow the NWS to deviate from IA requirements. The QAE(s) also have no authority to direct or interfere with the methods of performance by the NWS or to issue modifications directly to any of NWS personnel unless methods being used are unsafe. During the surveillance process, QAE(s) identify whether problems and issues identified are local in nature (e.g., facility or employee) or systemic. QAE(s) convey their determination to the CO and the COTR for follow-up action.

3.2.4 CWSU Board of Performance and Cost Review (BPCR)

The BPCR will be composed of both NWS and FAA representatives, and will afford both the

FAA and the NWS an opportunity to exchange information regarding the impact of proposed changes on the quality of CWSU services, including changes to the QASP. In this role, the BPCR may address concerns regarding systemic performance issues elevated to their attention. The NWS may also discuss discrepancies in the surveillance conducted or data collected by the FAA.

This forum also provides an opportunity to review NWS performance in conjunction with other CWSU services stakeholders including user and/or customer groups. The FAA may request participation from other FAA entities such as the Office of Operations Planning (ATO-P). At the FAA's discretion, the BPCR may address other matters relating to the quality of services produced by the NWS as a means of monitoring performance.

3.3 NWS Responsibility

The NWS is responsible for meeting all requirements in the IA and APLs in the PRS. In addition, the NWS is responsible for implementing a Quality Management Plan (QMP) submitted to and approved by the FAA. The NWS is responsible for producing, maintaining, and providing all management records and reports associated with surveillance of IA requirements. The NWS's QMP identifies specific roles and responsibilities within the NWS organization to incorporate aspects of quality assurance and quality control necessary to meet requirements of this IA.

We are proposing a dedicated Quality Assurance Manager (QAM) who will monitor program performance to ensure high-quality, standardized, responsive, and consistent NWS aviation products and services. The QAM will maintain the QASP and address any noted deficiencies with the CWSU Branch Chiefs and the AWC Director.

4.0 Quality Assurance Execution Strategy

4.1 Periods of Performance

Quality assurance is structured to address the performance periods identified in the pending IA. Performance expectations during each period differ; therefore, quality assurance strategies for CWSU services used by the FAA to monitor and evaluate NWS performance may vary. Where a historical performance baseline does not exist, the FAA and the NWS will work together to establish the duration of time for establishing an APL. Similarly, the FAA may consider the period of performance when assessing IA compliance with specific IA requirements. The FAA, in partnership with the NWS, will update the QASP accordingly.

4.1.1 Transition Period to Full Operating Capability

The NWS and the FAA will begin to document performance metrics during the DemVal. Upon achieving 1 full year into the Full Operating Capability (FOC), the NWS QAM will work with the FAA to ensure that resultant metrics accurately reflect the services provided. During this timeframe, the NWS QAM will refine the documented performance metrics and present them to the FAA for review and approval. Because the QASP is a living document, the FAA and the NWS will assess metrics periodically to ensure that the appropriate metrics are applied to the appropriate products and services.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00280 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Also, during this transition period and up to 1 full year into the FOC, we will establish appropriate thresholds for each metric to ensure adequate performance; we will also provide the appropriate incentives and disincentives. We propose to implement a metric development period to collect empirical data that will be used to establish a baseline for CWSU performance and set accurate thresholds. Initially, we will identify quantitative metrics for each requirement and qualitative metrics based on customer satisfaction. During the development phase, we will collect and report data on the quantitative metrics. Once the FAA and the NWS are satisfied that the proper metrics and associated thresholds are established, we will use quantitative and qualitative metrics. The length of the development phase will depend on the metrics and the FAA's comfort level with the thresholds.

4.2 Quality Assurance Evaluator Schedule

Upon the start of the Transition Period, the FAA QAE(s) and the NWS QAM establish and execute a schedule of surveillance based on the PRS and IA compliance surveillance requirements. Following an initial evaluation period, the FAA modifies the schedule based on NWS performance results. Additionally, the surveillance schedule may change at any time at the discretion of the CO or COTR or if any indications of diminishing service quality are apparent or when factors likely to impact performance are present or anticipated.

4.3 Surveillance Methods

The FAA employs various surveillance methods including reviews, surveying, direct observations, and document review. These methods are used interchangeably, based on the nature of the requirement or performance measure, in order to adequately evaluate NWS performance. The FAA's surveillance determines if the NWS is compliant with the requirements stated in the IA and is meeting performance levels presented in the PRS. The PRS identifies the surveillance method, evaluation frequency, and data source for performance measures. For IA compliance, the CO and COTR determine the most appropriate surveillance method for evaluating NWS compliance with specific IA requirements.

4.3.1 Quality Reviews

This method is designed to evaluate part or all of a set of products and services through careful investigation. Results of quality reviews must be clearly documented using a reporting tool. This approach is recommended for critical requirements and performance measures.

Examples of performance measures or IA requirements that could be monitored through quality reviews include:

- Training Compliance
- Response to Request for On-Demand Service
- Compliance with 24/7 Service Requirements
- Reliability of technology infrastructure

4.3.1.1. Planned Review

This method uses a comprehensive evaluation of selected products and services on a scheduled

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00281 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

basis (e.g., monthly or quarterly). The FAA notifies the NWS of the schedule and objectives for each set of evaluations prior to actual reviews. With this type of evaluation, the NWS knows that work performed in specific activities or selected locations is more likely to be monitored than work in other areas or locations. As an example, the FAA could assess NWS compliance with the dissemination of the aviation weather forecasts. In this situation, the FAA is more likely to focus the review on critical facets of information disseminated that is useful for traffic management planning.

4.3.1.2. Unplanned Review

This method uses a comprehensive evaluation of selected products and services on an unscheduled basis. The FAA may elect not to notify the NWS of the schedule and objectives for each set of evaluations prior to actual reviews. With this type of evaluation, the NWS may be unaware what work performed in specific activities or selected locations are likely to be monitored. As an example, QAE(s) could assess NWS compliance with on-demand services required by the FAA.

This method entails gathering a sample of data considered to be representative of a whole population or set of results in a systematic manner. Based on a series of related subjective measures, the survey results are tabulated with each measure weighted based on criticality. The survey may be used to evaluate a particular service such as advisory services. The survey results may be assessed on an individual basis or as an aggregate across facilities and services. The FAA notifies the NWS of survey scoring criteria and weighting in advance of implementing this surveillance method.

As an example, the FAA could issue a customer satisfaction survey to a variety of customers gauging customer satisfaction with the quality, timeliness, accuracy, customer service, and relevance of overall and specific services received. This survey could include customers that interact with either of the CWSUs. Results could be tabulated and assessed by office, across all offices, or in both manners.

4.3.2 Direct Observation

This method uses direct observation of CWSU services performed to enforce compliance with IA requirements. Observations can be performed periodically or through 100% surveillance. Observation activities include over-the-shoulder monitoring and conducting time and motion studies. For example, the FAA could elect to use direct observations to measure NWS conformity with the performance measure, "time to respond to request for on-demand service," within the PRS. Observations are documented in a log or checklist/evaluation form to capture performance levels for the monitored criteria. In the case of monitoring performance of CWSU services, evaluation forms record NWS performance against predetermined criteria published in the PRS and IA whenever possible.

4.3.3 Document Review

This method is designed to evaluate reports and records generated by the NWS or the FAA. This approach is effective when the data required is provided on a routine basis in a standard format. The reports may be based on one or more surveillance methods.

Document Review is predicated on regular and thorough documentation of all project activities.

4.4 Random Sampling

QAE(s) typically rely on a variety of techniques to assess a section of products or services and gauge the overall quality of all NWS products and services. These techniques can be applied to most of the surveillance methods discussed above. A technique commonly used by QAE(s) in the implementation of QASPs is Random Sampling.

This technique is appropriate for evaluating IA compliance or performance results when each occurrence of an activity has an equal and known chance of being selected or performed. This technique is recommended for large quantity, repetitive activities. It can be applied on a periodic basis when a deficiency is suspected.

It is important that the products or services selected be representative of the population, and not biased in a systematic manner. For example, selecting products and services in a particular ARTCC with non-varying weather may require less complicated CWSU services than a region that is subject to varying fog, volcanic ash, or mountain wave turbulence. Since the FAA considers the performance of the whole population of products or services based on the review of the sample, these types of products and services should not be under- or over-represented.

4.5 Reporting Tools

Managing the diversity of performance information is crucial to an objective evaluation process. The FAA uses the following tools to record and report performance results. Other tools may be developed as performance measures and areas of surveillance are added or adjusted.

4.5.1 NWS Deficiency Report

This report included in Appendix B is a sample form for documenting unsatisfactory NWS performance. It also allows the NWS to address concerns about performance issues and to offer solutions and timelines for resolution. This sample report establishes an audit trail from identification of a deficiency to remediation actions required to issue resolution.

4.5.2 Sampling Guide/Review Checklist

QAE(s) use the sampling guide/review checklist, a sample of which is included in Appendix C for identifying each IA requirement to be reviewed. QAE(s) then complete the document during a review. The sampling guide shows the specific tasks to be reviewed and whether the review is passed. QAE(s) write specific comments on the bottom of the sampling guide. The CO may use the guide to bring defects to the NWS's attention. All instances of unacceptable performance detected require NWS initials on the original sampling guide, indicating notification of the problem.

4.6 Performance Results

The FAA assesses performance of the NWS based on the NWS's ability to comply with the requirements of the IA and meet defined performance criteria established in the PRS. Performance is monitored measure-by-measure and requirement-by-requirement through the

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00283 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

collection of data pertaining to the IA, PRS and CDRLs.

4.6.1 Satisfactory Performance

Satisfactory performance indicates the NWS is meeting IA requirements, or the NWS is meeting or exceeding stated APLs. When the NWS's performance is satisfactory, the number of deficiencies does not exceed the allotted acceptable thresholds identified in the evaluation criteria. Although the NWS's performance may be deemed satisfactory, the QAE(s) may suggest to the COTR that an increased level of surveillance be used if defect rates are trending toward the minimum APL.

4.6.2 Unsatisfactory Performance

Unsatisfactory performance indicates the NWS is either not meeting IA requirements, or not meeting stated APLs. When the NWS's performance is unsatisfactory, the number of deficiencies exceeds the allotted acceptable thresholds identified in the evaluation criteria. The FAA's QASP facilitates the determination of deficiencies under an IA arrangement. The FAA's primary concern is with the products and services provided by the NWS and not with the procedures used to produce them. However, if the delivery of any required product or service is determined to be unsatisfactory, NWS procedures may also be reviewed to identify sources of performance deficiency.

4.6.3 Documenting Unsatisfactory Performance

Thorough documentation of unsatisfactory performance is essential. The QAE(s), as trained inspectors, document unsatisfactory performance by compiling facts during their reviews and evaluations conveying this information in their surveillance results. The COTR then develops documentation to substantiate non-compliance with the performance requirements. The documentation, together with any recommendations, is forwarded to the CO.

4.7 Reports

4.7.1 Site Review Reports

Within 15 days of a site review, a report is submitted to the QAM. The purpose of the report is to provide the FAA with a general overview of the office inspected including significant observations, issues and problems encountered. The report documents items of concern that would not be captured in the performance measurement data. Also contained within the report are accolades and information regarding the CWSU personnel that rendered assistance and the time required to provide support.

4.7.2 Performance Measure Statistical Reports

The QAM will generate a performance measure statistical report for reporting to the CWSU Branch Chiefs, the AWC Director, and the BPCR. The report may cover what has been completed for that current quarter and forecast what the performance measures may look like at the end of the quarter. The reports normally have graphs and narratives with discussion points addressing specific issues and comments including historical data.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00284 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

4.7.3 Trend Analysis Reports

The QAM prepares an analysis report, which can be of one performance measure, a group of performance measures, or the overall service. This report is a time-based analysis that indicates the need for historical data. A trend analysis report will normally contain graphs, a narrative with in-depth analysis, and an executive summary. The report may include what the analyst considers to be the implications of the trend (especially if the trend shows or implies a deterioration of services). The report may also include suggestions and ideas that could be discussed to stem, correct, change the direction, or lessen the impact of the trend.

4.7.4 Reporting Beyond the Performance Measures

The QAM prepares this report by request. The report covers a range of topics that are part of the IA, but not measured for performance purposes nor routinely reported as a necessary deliverable under any CDRL. The scope of this report is very broad and consolidates observations by FAA and NWS stakeholders. The report encompasses a big picture of the delivery of service, performance measurement, and customer feedback. It may emphasize strategic issues, needs, and directions that may be evaluated by stakeholders of CWSU services. Historical data can be used to emphasize or de-emphasize trends or points.

4.7.5 Deficiency Reports

Unsatisfactory performance is continuously documented and analyzed for local or systemic problems and concerns. If the unsatisfactory performance continues, the QAE(s) may recommend that the QAM submit a NWS IA Deficiency Report to the CO. Upon receipt of a deficiency report, the CO may require the NWS to take necessary action to ensure that performance conforms to IA requirements. The CO may refer systemic issues to the BCPR for further discussion.

5.0 Surveillance Adjustments

As described below, the level of surveillance may be adjusted based upon the performance of the NWS or changes in the operational environment.

5.1 Satisfactory Performance

Continuous satisfactory performance by the NWS may allow the COTR and the QAE(s) to consider maintaining the current level of surveillance. However, the QAE(s) may periodically change the evaluation frequency, lot size, surveillance method, and surveillance technique to assess different facets of IA requirements or PRS performance measures. The actual modifications would be based upon the judgment of the QAE(s) and COTR. The change should always be staged over time to measure the tendency of how the NWS performs in an environment of modified surveillance. A demonstration of satisfactory performance at each state of modified surveillance will allow the CO to determine an appropriate modified surveillance level. Upon 2 years' consecutive successful performance, the NWS and FAA will jointly discuss automatic IA renewal in subsequent years, or other incentives.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00285 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

5.2 Unsatisfactory Performance

If the delivery of any required product or service is determined to be unsatisfactory, NWS procedures may also be reviewed to identify sources of performance deficiency. Unsatisfactory performance by the NWS may prompt the COTR and the QAE(s) to increase the level of surveillance. The lot size, frequency of evaluation, surveillance method, and surveillance technique may be modified to apply greater scrutiny on the day-to-day performance of the NWS. Regardless of the cause or source, the NWS is held responsible for all identified deficiencies.

Normal surveillance levels should be resumed whenever performance improves to the point acceptable to the COTR. Normal review should be resumed in a staged manner over a period of time. The COTR requires adequate time to verify NWS performance improvements to ensure that acceptable service levels will continue despite reductions in oversight.

5.3 Changes to Operational Environment

Anticipation or occurrence of a significant change in the operational environment due to heightened national security, infrastructure modifications, personnel reduction or transfer, newly introduced NWS procedures or processes, or other activities disrupting the status quo, may require the FAA to increase the level of surveillance. QAE(s) may consider change to the evaluation frequency, lot size, or surveillance technique to better gauge NWS performance throughout the change in the operation environmental. Any reduction in surveillance should be gradual and staged over time to measure how the NWS performs in an environment of reduced surveillance. Excellent performance at each state of reduced surveillance will allow the CO to approve lower surveillance levels.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00286 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix A: Performance Requirements Summary

The following table presents a draft PRS, which identifies key performance measures for quality and timeliness by IA reference number. These evaluation criteria will be jointly and more fully developed and refined during the DemVal—and will be agreed to by both the FAA and NWS, per the IA.

Technical Exhibit # D-1: Draft Performance Requirements Summary

The columns are defined as follows:

Performance Measure - Indicates the outcome by which the agency will monitor NWS performance.
Performance Measure Definition - Provides a description and context for how the performance measure will be calculated.
Applicable Services - Indicates the services to be evaluated using the stated performance measure.
Acceptable Performance Level (APL) - Indicates the performance level that is acceptable for a given performance measure.
Evaluation Frequency - Indicates standard period when performance will be evaluated
Data Source - Indicates the primary source of information that will be used to evaluate performance.
Surveillance Method - Indicates the primary technique for monitoring and evaluating performance.

Primary Metrics							
ID	Performance Measure	Performance Measure Definition	Applicable Services	Acceptable Performance Level (APL)	Evaluation Frequency	Data Source	Surveillance Method
1	**CWSU Customer Satisfaction Index**	The resulting index rating is based on a series of questions gauging customer satisfaction with quality, timeliness, accuracy, customer service, number of validated complaints of the CWSU services received.	Aggregate, By Service	TBD	Quarterly	TMU survey sample	Document Review
2	**Service Delivery Conformity Index Score**	The resulting score based on a standard evaluation process whereby ratings in the provision of both standardized and customized services equate to a conformity index score for aviation weather services for each facility evaluated.	Aggregate	TBD	Periodic	FAA Traffic Management Web-based evaluation form	TMU data entry and document review

3	**Time to Respond to Request for On-demand Service**	The sum of requests per week directed at the CWSU and answered within a specific time designated divided by total requests received per week.	Aggregate	Time Oriented	Quarterly	Telecommunication Records	Document Review
4	**Accuracy of Forecast**	The direct correlation of forecast generated by the CWSU and weather events that actually occurred.	Aggregate	TBD	Quarterly	NWS to propose data source and analysis methods for approval by FAA	Document Review
Proposed Additional Performance Measures:							
5	**Product Consistency**	CWIP inconsistencies are identified, resolved, and corrected in a timely manner	Aggregate	TBD of inconsistencies resolved within 2 hours	Periodic	CWIP data; TAF forecasts	Document Review
6	**Timely CWIP Updates**	Updated CWIP data is posted at least every 2 hours, corresponding to the FAA's Strategic Planning Team telcons.	Aggregate	TBD of updates posted on time	Periodic	CWIP data	Document Review
7	**Timely Scheduled Briefings**	Briefing product suite available within a 30-minute window prior to scheduled briefings, as specified by the FAA.	Aggregate	TBD of briefings	Periodic	Project records	Document Review
8	**Availability of Products via Web Portal**	The web portal will conform to the FAA's QICP standards described in FAA AC 00-62 for reliability, accessibility, and security Internet communications for aviation weather.	Aggregate	QICP Standard	Periodic	CWSU Portal	Document Review
9	**Training Completion**	All CWSU, FAA, and contractor personnel receive standardized training on CWSU operations.	Aggregate	TBD% of staff completes the training	At the close of transition phase, then annually	Project records	Document review
10	**Timely Reporting**	Key reports, including monthly progress reports, are submitted to FAA in a complete and timely manner	Aggregate	TBD% on-time reports	Periodic	Project records	Document Review

A.1 Performance Measures

A.1.1 Performance Measure #1: CWSU Customer Satisfaction Index

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
CWSU Customer Satisfaction Rating	The resulting index rating is based on a series of questions gauging customer satisfaction with quality, timeliness, accuracy, customer service, number of validated complaints of the CWSU services received.	>TBD%	TMU survey sample	Document review

A.1.1.1 Data Source Description

The customer satisfaction rating will be based upon TMU responses to CWSU services in a questionnaire, developed jointly by the FAA and the NWS, containing the following customer service indicators:

- Quality
- Timeliness
- Accuracy
- Customer Service
- Number of validated complaints

The recommended approach for the customer service questionnaire is a web-based survey that would be completed by the appropriate FAA recipients of CWSU services (including TMU management staff). The FAA and NWS will jointly develop an approach to make a web-based survey available and to collect survey results. In addition, both agencies will establish a baseline of FAA customers to be surveyed.

A.1.1.2 Primary Surveillance Method(s)

Customer Satisfaction Survey Review	
Frequency:	Quarterly
Actions:	Administration of a customer service questionnaire

A.1.2 Performance Measure #2: Service Delivery Conformity Index Score

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Service Delivery Conformity Index Score	The resulting score based on a standard evaluation process whereby ratings in the provision of both standardized and customized	>TBD%	FAA Traffic Management web-based evaluation form	TMU data entry and document review

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
	services equate to a conformity index score for aviation weather services for each facility evaluated. Note: Checklist of standardized and customized local weather services will be used to determine score.			

A.1.2.1 Data Source Description

A web-based evaluation form will be made available to Traffic Management Coordinators that indicates the items to be included in daily briefings and products. The FAA and NWS will jointly develop the specific list of items that are to be included in the score and the criteria to be used by FAA staff in assessing conformance. If possible, the web-based forms for this measure and for the Customer Satisfaction Index (A.1.1) may be combined for ease of accomplishing the evaluation by FAA staff.

A.1.2.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	The web-based evaluation form will include a list of briefings and meteorological products and services. The items should be those relevant clauses covered in 7210.38

A.1.3 Performance Measure #3: Time to Respond to Request for On-demand Service

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Time to Respond to Request for On-demand Service	The sum of requests per week directed at the CWSU and answered within a designated time divided by total requests received per week.	Time oriented	Telecommunications records, Instant Message Logs, Interactive On-Line Web Collaboration Logs	Document review

A.1.3.1 Data Source Description

A record keeping system must be in place to record requests made by the TMU directed at the CWSU for remote, on-demand meteorological briefing services. FAA and NWS will jointly develop agreed-upon response time standards and a technical approach for record keeping.

A.1.3.2 Primary Surveillance Method(s)

Frequency:	Quarterly
Actions:	Record review by Quality Assurance Evaluator

A.1.4 Performance Measure #4: Accuracy of CWSU Specific Forecasts

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Accuracy of CWSU Specific Forecasts	The direct correlation of forecast generated by the CWSU and weather events that actually occurred.	TBD	Archived Weather Information, FAA Daily Reports, Other FAA Traffic summaries and logs	Document review

A.1.4.1 Data Source Description

An evaluation mechanism should be put in place where CWSU services and products will be analyzed for meteorological accuracy. This will require that CWSU services and products be recorded using a method determined by the CWSU. The recorded information will later be compared by the NWS with actual weather occurrences and Traffic Management Initiatives for forecast accuracy.

This measure will initially focus on CWIP forecasts and CWAs. Within 60 days of Authorization to Proceed with the DemVal, the NWS will propose a specific methodology for measuring and reporting the accuracy of the forecast information in each of these products. The NWS will consider current verification initiatives, such as Real Time Verification System (RTVS) (which currently verifies CCFP and convective SIGMETs), Weather Impacted Traffic Index (WITI), and other performance undertakings from the NWS Performance Branch. The proposed methodology will include the specific parameters, the data to be used for verification, a schedule for phasing in this measurement and a proposed APL.

Frequency:	Quarterly
Actions:	Subject matter expert analysis of recorded data

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00291 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Proposed Additional Performance Measures

A.1.5 Performance Measure #5: Product Consistency

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Product Consistency	CWIP inconsistencies are identified, resolved, and corrected in a timely manner.	TBD% of inconsistencies resolved within 2 hours	CWIP data; TAF forecasts	Document Review

A.1.5.1 Data Source Description

The goal of CWIP is to provide a common weather picture. For example, if the CWIP identifies an area of low ceiling and visibility affecting a particular TRACON and the in-effect TAF forecast does not, the appropriate CWSU Lead Forecaster will coordinate with the relevant issuing offices to resolve the inconsistency and adjust the products as necessary.

A.1.5.2 Primary Surveillance Method(s)

CWSU Forecasters will monitor forecast data continuously. As inconsistencies are identified, they will work to resolve the inconsistency. Working collaboratively with the FAA, the NWS will develop a tracking tool to record the nature, time, and resolution of the discrepancy.

Frequency:	Periodic
Actions:	Forecasters will resolve data inconsistencies on an ongoing basis. Quality Assurance Evaluators will periodically review tracking documents to evaluate the timeliness of resolution, and recommend corrective action in the case of a pattern of delays longer than 2 hours.

A.1.6 Performance Measure #6: CWIP Updates

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Timely CWIP Updates	Updated CWIP data is posted at least every 2 hours, corresponding to the FAA's Strategic Planning Team telcons.	TBD% of updates posted on time	CWIP data	Document Review

A.1.6.1 Data Source Description

As part of its core functionality, CWIP incorporates a history of when updates were posted to the web interface. Records will be kept on when updates were posted via CWIP.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00292 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

A.1.6.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	Program staff will post updates on an ongoing basis. Quality Assurance Evaluators will periodically review tracking documents to evaluate the timeliness of posts, and recommend corrective action in the case of a pattern of delays.

A.1.7 Performance Measure #7: Timely Scheduled Briefings

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillanc e Method
Timely Scheduled Briefings	Briefing product suite is available within a 30-minute window prior to scheduled briefings, as specified by the FAA.	TBD% of briefings	Project records	Document Review

A.1.7.1 Data Source Description

Regular project recordkeeping will indicate whether or not briefings were held each day. If a briefing is not held due to emergency or extenuating circumstances, a note of explanation will be entered as a "memo to the file."

A.1.7.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	Quality Assurance Evaluators will periodically review project records to evaluate the timeliness of briefings.

A.1.8 Performance Measure #8: Availability of Products via Web Portal

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Availability of Products via Web Portal	The Web Portal will conform to the FAA's QICP standards described in FAA Advisory Circular (AC) 00-62 for reliability, accessibility, and security of internet communications for aviation weather.	QICP Standards	CWSU Portal	Document Review

A.1.8.1 Data Source Description

CWSU-specific products, including the CWIP and CWAs, as well as national, regional, and local weather briefings, will be available to the FAA and other users through direct access to the CWSU Web Portal. All products will be made available in a timely manner via the portal, and the NWS will take all measures possible to ensure that the portal is secure and that its hosting environment is sufficiently robust as to ensure high uptime.

A.1.8.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	Program staff will post updates on an ongoing basis. Quality Assurance Evaluators will periodically review the portal to evaluate the timeliness of posting, and recommend corrective action in the case of a pattern of delays.

A.1.9 Performance Measure #9: Training Completion

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Training Completion	All CWSU, FAA, and contractor personnel receive standardized training on CWSU operations.	TBD% of staff completes the training	Project records	Document review

A.1.9.1 Data Source Description

Standardized training provided to all staff will support consistent and accurate forecast products and services. Project records will indicate training compliance.

A.1.9.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	At the close of the transition period, Quality Assurance Evaluators will ascertain that all staff have completed or are in the process of completing the training. As new staff is added, they will have a reasonable period in which to complete the training.

A.1.10 Performance Measure #10: Reporting

Performance Measure	Performance Measure Definition	APL	Data Source	Surveillance Method
Timely Reporting	Key reports, including monthly progress reports, are submitted to FAA in a complete and timely manner	TBD% on-time reports	Project records	Document Review

A.1.10.1 Data Source Description

The NWS will meet quarterly with the FAA to provide progress reports and will provide written transition reports in accordance with the FAA's RD. Our key reporting documents are:

CDRL	Title
001	Quality Management Plan
002	Transition Reports
003	Operational Change Proposal
004	Facilities Implementation Plan

A.1.10.2 Primary Surveillance Method(s)

Frequency:	Periodic
Actions:	Program staff will post reports to the portal on an ongoing basis. Quality Assurance Evaluators will periodically review the portal to evaluate the timeliness and completeness of reports, and recommend corrective action in the case of a pattern of delays.

Appendix B: CWSU Deficiency Report

1. IA NUMBER DEFICIENCY REPORT NUMBER:
2. TO: (CWSU LOCATION & MANAGER'S NAME) 3. FROM: (NAME OF COTR)
DATES 4. PREPARED - ORAL NOTIFICATION - RETURNED BY CWSU LOCATION - ACTION COMPLETE
5. DEFICIENCY OR PROBLEM (DESCRIBE IN DETAIL. INCLUDE REQUIREMENTS DOCUMENT REFERENCES. ATTACH CONTINUATION SHEET IF NECESSARY):
6. SIGNATURE OF QAE:
7. TO: (CONTRACTING OFFICER) FROM (CWSU)
8. CWSU RESPONSE AS TO CLAUSE, CORRECTIVE ACTION AND ACTIONS TO PREVENT RECURRENCE (ATTACH CONTINUATION SHEET IF NECESSARY. CITE APPLICABLE QUALITY CONTROL PROGRAM PROCEDURES OR NEW QUALITY CONTROL PROCEDURES):
9. SIGNATURE OF CWSU REPRESENTATIVE: DATE:

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00296 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix C: Sampling Guide/Review Checklist

SERVICE CATEGORY: Center Weather Services Unit, Products

NOTE: S = Satisfactory Performance U = Unsatisfactory Performance N/A = Not Applicable

1	**Method of Surveillance:**			
2	**Lot Size:**			
3	**Sample Size:**			
4	**Performance Requirement:** Performance is satisfactory (S) when ____ or fewer deficiencies are discovered per month. Performance is unsatisfactory (U) when _______________ or more deficiencies are discovered per month.			
5	**Sampling Procedure:** Instructions on how to select the sample must be clear and complete			
6	**Review Procedure:** The procedure must be detailed enough to allow a yes/no objective decision as to the acceptability of performance by anyone conducting the review. Explain when evaluation is to occur and what is acceptable/unacceptable			
		Performance: Satisfactory (S), Unsatisfactory (U), Not Applicable (N/A)		
	PRS Requirements	**Timeliness**	**Quality of Work**	**Notes**
.				
	Overall Rating Of Review (S, U, or N/A)			

Inspector Comments:	
CWSU Signature	**Date**
QAE(s) Signature: \	**Date:**

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00297 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

#12

United States Government Accountability Office

GAO

Report to Congressional Requesters

January 2008

AVIATION WEATHER

FAA Is Reevaluating Services at Key Centers; Both FAA and the National Weather Service Need to Better Ensure Product Quality

GAO

Accountability * Integrity * Reliability

GAO-08-258

January 2008

GAO Highlights

GAO Accountability•Integrity•Reliability

Highlights of GAO-08-258, a report to congressional requesters

AVIATION WEATHER

FAA Is Reevaluating Services at Key Centers; Both FAA and the National Weather Service Need to Better Ensure Product Quality

Why GAO Did This Study

The National Weather Service's (NWS) weather products are a vital component of the Federal Aviation Administration's (FAA) air traffic control system. In addition to providing aviation weather products developed at its own facilities, NWS also provides staff on-site at each of FAA's en route centers (see fig.). This group of NWS meteorologists—called a center weather service unit—provides air traffic managers with forecasts and briefings on regional conditions including turbulence, icing, and freezing precipitation.

GAO agreed to (1) determine the status of NWS's plans for restructuring the offices that provide aviation weather services at FAA's en route centers, (2) identify FAA's requirements and its alternative sources for these services, and (3) evaluate both agencies' current abilities to ensure the consistency and quality of these services. To do so, GAO evaluated agency plans for restructuring offices, defining requirements, and ensuring quality products, and interviewed agency officials.

What GAO Recommends

GAO is recommending that Commerce and Transportation define performance measures for aviation weather services and evaluate the quality of these services. Commerce agreed with the recommendations. Transportation did not agree or disagree with the recommendations, but stated that its just-released requirements include performance measures and evaluation procedures.

To view the full product, including the scope and methodology, click on GAO-08-258. For more information, contact David Powner at (202) 512-9286 or pownerd@gao.gov.

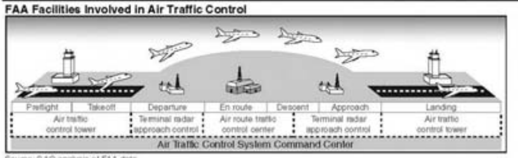
What GAO Found

NWS developed a proposal for restructuring the offices that provide aviation weather services at FAA's en route centers, but these plans are currently on hold. In 2005, FAA requested that NWS restructure its center weather service units by consolidating offices, providing remote services, and reducing personnel costs. In response, NWS conducted a prototype that demonstrated that the services the center weather service units currently provide could be provided remotely by the closest weather forecast office. It subsequently proposed to implement this prototype, but FAA declined this proposal. NWS may reconsider its proposal or other alternative organizational structures as it works to meet FAA's needs in the future.

FAA considers its existing requirements governing the center weather service units to be too broad to ensure the efficiency and cost-effectiveness of the services, so the agency worked for several months to redefine its requirements. By September 2007, FAA had developed draft requirements that specified the products and services to be performed by meteorologists at the en route center, including conducting weather briefings and developing local icing and turbulence forecasts. FAA finalized a more expansive set of requirements at the end of December 2007, and expects NWS to respond within 120 days on its ability to fulfill the requirements. FAA has stated that, if NWS is unable to meet the requirements, it will consider using alternative sources such as private industry or government laboratories to meet the requirements.

Although interagency agreements between NWS and FAA state that both agencies have responsibilities for assuring and controlling the quality of aviation weather observations, neither agency consistently does so for weather products and services produced at the en route centers. Specifically, neither agency has developed performance measures and metrics, regularly evaluated weather service unit performance, or provided feedback to improve these aviation weather products and services. Because of this lack of performance tracking and oversight, NWS cannot demonstrate the quality or value of its services, and FAA cannot ensure the quality of the services it funds. Until both agencies are able to measure and ensure the quality of the aviation weather products at the en route centers, FAA may not be getting the information it needs to effectively manage air traffic.

FAA Facilities Involved in Air Traffic Control



Source: GAO analysis of FAA data

Contents

Abbreviations

FAA	Federal Aviation Administration
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service

GAO
Accountability * Integrity * Reliability
United States Government Accountability Office
Washington, DC 20548

January 11, 2008

Congressional Requesters

The National Weather Service (NWS) plays a significant role in providing weather services to the aviation community. NWS's weather products and data are vital components of the Federal Aviation Administration's (FAA) air traffic control system, providing weather information to local, regional, and national air traffic management, navigation, and surveillance systems. NWS aviation weather products include forecasts and warnings of meteorological conditions that could affect air traffic, including thunderstorms, air turbulence, and icing.

In addition to providing aviation weather products that are developed at its own facilities, NWS also provides staff on-site at each of FAA's en route centers—the facilities that control high-altitude flight outside the airport tower and terminal areas. This group of NWS meteorologists—called a center weather service unit—provides air traffic managers with forecasts, advisories, and periodic weather briefings on regional conditions.

Over the last few years, FAA has been exploring its options for enhancing the efficiency of the aviation weather services provided at its en route centers. Because of your interest in possible changes to NWS's aviation weather services, we agreed to (1) determine the status of NWS's plans for restructuring the offices that provide aviation weather services at FAA's en route centers, (2) identify FAA's requirements and its alternative sources for these services, and (3) evaluate both agencies' current abilities to ensure the consistency and quality of these services.

To address our objectives, we reviewed NWS's plans for restructuring its center weather service units, interagency agreements governing the aviation weather program and its requirements, and efforts by both FAA and NWS to ensure the quality of aviation weather service. We compared the agencies' efforts with best practices for quality assurance. We also interviewed relevant agency officials, as well as FAA and NWS employees at en route centers. We performed our work at FAA and NWS headquarters offices, an FAA air traffic control tower, and FAA's Air Traffic Control System Command Center, in the Washington, D.C., metropolitan area. In addition, we conducted work at four en route centers across the country and at NWS's Aviation Weather Center in Kansas City, Missouri. We conducted this performance audit from May

2007 to December 2007, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Additional details on our objectives, scope, and methodology are provided in appendix I.

Results in Brief

NWS developed a proposal for restructuring the offices that provide aviation weather services at FAA's en route centers, but these plans are currently on hold. In 2005, FAA requested that NWS restructure its center weather service units by consolidating offices, providing remote services, and reducing personnel costs. In response, NWS conducted a prototype that demonstrated that the services currently provided by the center weather service units could be provided remotely by the closest weather forecast office—effectively removing the center weather service unit staff from the en route center. It subsequently presented a proposal for implementing this prototype, but FAA declined this proposal. Instead, FAA decided to more clearly define its requirements for the weather services provided at en route centers. NWS officials stated that they may revise the proposal or consider other alternative organizational structures to meet FAA's needs in the future.

FAA considers its existing requirements governing center weather service units to be too broad to ensure the efficiency and cost-effectiveness of the services, so the agency worked for several months to redefine its requirements. By September 2007, FAA had developed draft requirements that specified the products and services to be performed by the meteorologists at the en route centers, including conducting weather briefings and developing local icing and turbulence forecasts. FAA finalized a more expansive set of requirements at the end of December 2007 and expects NWS to respond within 120 days on its ability to fulfill the requirements. FAA stated that if NWS is unable to meet the requirements, it will consider using alternative sources such as private industry or government laboratories to meet the requirements.

Although interagency agreements between NWS and FAA state that both agencies have responsibilities for assuring and controlling the quality of aviation weather observations, neither agency consistently does so for weather products and services produced at the en route centers. Specifically, neither has developed performance measures and metrics, regularly evaluated weather service unit performance, or provided feedback to improve these aviation weather products and services. Because of this lack of performance tracking and oversight, NWS cannot demonstrate the quality or value of its services, and FAA cannot ensure the quality of the services it funds. Until both agencies are able to measure and ensure the quality of the aviation weather products and services at the en route centers, FAA may not be getting the information it needs to effectively manage air traffic.

We are making recommendations to the Secretaries of Commerce and Transportation to ensure that NWS and FAA develop performance measures for aviation weather services provided at en route centers, evaluate the services against those measures, and provide feedback to the NWS staff on how to improve services. In written comments on a draft of this report, the Secretary of Commerce agreed with our recommendations and stated that after FAA provides its revised requirements, the National Oceanic and Atmospheric Administration (NOAA) would work with FAA to develop methods for performance monitoring and evaluation. The Department of Transportation's Director of Audit Relations also provided comments via e-mail on a draft of this report, but the department did not agree or disagree with our recommendations. In its comments, the department stated that FAA's revised requirements document establishes performance measures and evaluation procedures, and that FAA would negotiate with NWS to implement them. Both departments also provided technical comments that we incorporated as appropriate.

Background

FAA is responsible for ensuring safe, orderly, and efficient air travel in the national airspace system. NWS supports FAA by providing aviation-related forecasts and warnings at air traffic facilities across the country. Among other support and services, NWS provides four meteorologists at each of FAA's 21 en route centers to provide on-site aviation weather services. This arrangement is defined and funded under an interagency agreement.

FAA's Mission and Organizational Structure

FAA's primary mission is to ensure safe, orderly, and efficient air travel in the national airspace system. FAA reported that, in 2006, air traffic in the national airspace system exceeded 46 million flights and 750 million passengers. In addition, at any one time, as many as 7,000 aircraft—both civilian and military—could be aloft over the United States. In 2004, FAA's Air Traffic Organization was formed to, among other responsibilities, improve the provision of air traffic services. More than 36,000 employees

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00304 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

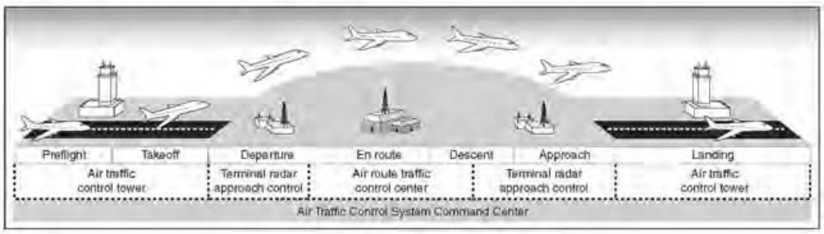
within FAA's Air Traffic Organization support the operations that help move aircraft through the national airspace system.

The agency's ability to fulfill its mission depends on the adequacy and reliability of its air traffic control systems, as well as weather forecasts made available by NWS and automated systems. These resources reside at, or are associated with, several types of facilities: air traffic control towers, terminal radar approach control facilities, air route traffic control centers (en route centers), and the Air Traffic Control System Command Center. The number and functions of these facilities are as follows:

- 517 air traffic control towers manage and control the airspace within about 5 miles of an airport. They control departures and landings, as well as ground operations on airport taxiways and runways.
- 170 terminal radar approach control facilities provide air traffic control services for airspace within approximately 40 miles of an airport and generally up to 10,000 feet above the airport, where en route centers' control begins. Terminal controllers establish and maintain the sequence and separation of aircraft.
- 21 en route centers control planes over the United States—in transit and during approaches to some airports. Each center handles a different region of airspace. En route centers operate the computer suite that processes radar surveillance and flight planning data, reformats it for presentation purposes, and sends it to display equipment that is used by controllers to track aircraft. The centers control the switching of voice communications between aircraft and the center, as well as between the center and other air traffic control facilities. Two en route centers also control air traffic over the oceans.
- The Air Traffic Control System Command Center manages the flow of air traffic within the United States. This facility regulates air traffic when weather, equipment, runway closures, or other conditions place stress on the national airspace system. In these instances, traffic management specialists at the command center take action to modify traffic demands in order to keep traffic within system capacity.

See figure 1 for a visual summary of the facilities that control and manage air traffic over the United States.

Figure 1: FAA Facilities Involved in Air Traffic Control



Source: GAO analysis of FAA data.

NWS's Mission and Organizational Structure

The mission of NWS—an agency within the Department of Commerce's NOAA—is to provide weather, water, and climate forecasts and warnings for the United States, its territories, and its adjacent waters and oceans to protect life and property and to enhance the national economy. In addition, NWS is the official source of aviation- and marine-related weather forecasts and warnings, as well as warnings about life-threatening weather situations.

The coordinated activities of weather facilities throughout the United States allow NWS to deliver a broad spectrum of climate, weather, water, and space weather services in support of its mission. These facilities include 122 weather forecast offices located across the country that provide a wide variety of weather, water, and climate services for their local county warning areas, including advisories, warnings, and forecasts; 9 national prediction centers[1] that provide nationwide computer modeling to all NWS field offices; and 21 center weather service units that are located at FAA en route centers across the nation and provide meteorological support to air traffic controllers.

[1]These centers include the National Centers for Environmental Prediction Central Operations, Aviation Weather Center, Environmental Modeling Center, Hydrometeorological Prediction Center, Ocean Prediction Center, Storm Prediction Center, Tropical Prediction Center/National Hurricane Center, Climate Prediction Center, and Space Environment Center.

NWS Provides Aviation Weather Services to FAA

As an official source of aviation weather forecasts and warnings, several NWS facilities provide aviation weather products and services to the FAA and aviation sector. These facilities include the Aviation Weather Center, weather forecast offices located across the country, and center weather service units located at FAA en route centers.

Aviation Weather Center

The Aviation Weather Center located in Kansas City, Missouri, issues warnings, forecasts, and analyses of hazardous weather for aviation. Staffed by 65 personnel, the center develops warnings of hazardous weather for aircraft in flight and forecasts of weather conditions for the next 2 days that could affect both domestic and international aviation. The center also leads a collaborative effort to develop a forecast of expected convective events for the entire country every 2 hours. This is used by FAA to manage aviation traffic flow across the country. The Aviation Weather Center's key products are described in table 1.

Table 1: Weather Products Developed by the Aviation Weather Center

Weather product	Description
Significant Meteorological Information	A brief description of the development and occurrence or expected occurrence of certain nonthunderstorm weather conditions that may affect the safety of aircraft in the en route environment. These conditions include severe icing not associated with thunderstorms, severe or clear air turbulence not associated with thunderstorms, dust or sand storms that lower visibility to below 3 miles, volcanic ash, and tropical cyclones.
Convective Significant Meteorological Information	A text product describing the occurrence or expected occurrence of thunderstorms and related weather conditions over the contiguous United States within 2 hours of issuance time.
Airman's Meteorological Information	A brief description of the development and occurrence or expected occurrence of certain nonthunderstorm weather conditions that may affect the safety of aircraft in the en route environment, but that do not meet the criteria to develop a Significant Meteorological Information product.
Collaborative Convection Forecast Product	A graphical convection forecast developed for strategic planning and management of en route air traffic. It is produced every 2 hours through collaboration—by way of an online chat room—among the Aviation Weather Center, the Meteorological Services of Canada, airline meteorology departments, FAA's Air Traffic Control System Command Center, and the center weather service units. These collaborative forecasts are produced between March 1 and October 31 every year.

Source: GAO analysis of NWS data.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00307 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Weather Forecast Offices

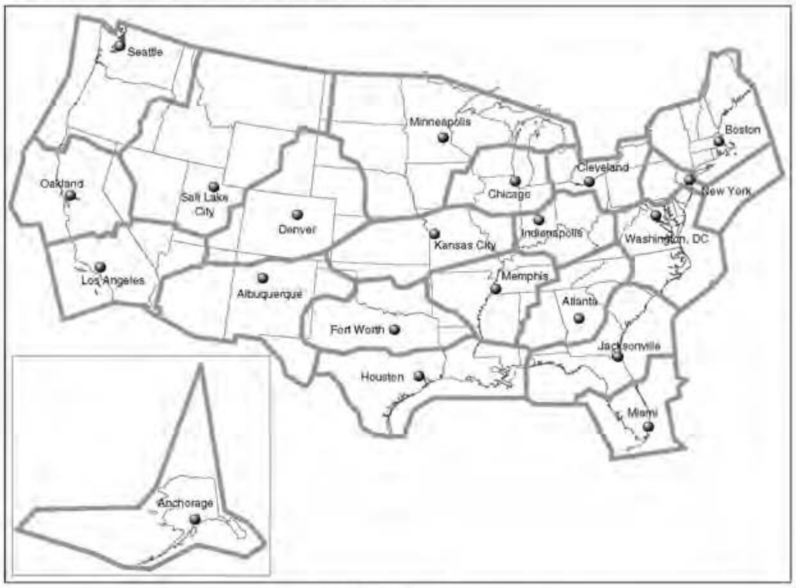
NWS's 122 weather forecast offices issue terminal area forecasts for approximately 625 locations every 6 hours or when conditions change. These forecasts consist of the expected weather conditions significant to a given airport or terminal area and are primarily used by commercial and general aviation pilots.

Center Weather Service Units

NWS's center weather service units are located at each of FAA's 21 en route centers and operate 16 hours a day, 7 days a week (see fig. 2). Each weather service unit usually consists of three meteorologists and a meteorologist-in-charge who provide strategic advice and aviation weather forecasts to FAA traffic management personnel. Governed by an interagency agreement, FAA currently reimburses NWS approximately $12 million annually for this support.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00308 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Figure 2: Center Weather Service Unit Locations and Service Areas



Source: NWS (data), Map Resources (map).

Center Weather Service Units: An Overview of Systems and Operations

The meteorologists at the center weather service units use a variety of systems to gather and analyze information compiled from NWS and FAA weather sensors. Key systems used to compile weather information include FAA's Weather and Radar Processor, FAA's Integrated Terminal Weather System, and a remote display of NWS's Advanced Weather Interactive Processing System. Meteorologists at the en route centers located along the Northeast air traffic corridor also use FAA's Corridor

Integrated Weather System to oversee the interaction of air traffic routes and weather. Table 2 provides a description of selected systems.

Table 2: Systems Used in the Center Weather Service Units

System	Description
Weather and Radar Processor	FAA's Weather and Radar Processor is used in en route centers and receives information from automated weather sensors located at airports and from other sources such as weather satellites. It compiles the information and provides current weather and forecasts to air traffic supervisors, traffic flow managers, and the center weather service unit meteorologists.
Advanced Weather Interactive Processing System—Remote Display	NWS's Advanced Weather Interactive Processing System integrates hydrometeorological data from a variety of sources and produces graphical displays at NWS weather forecast offices, river forecast centers, and national centers. This system aids forecaster analysis and decision making. Meteorologists at the en route centers have access to this system through a remote display system, which provides a dedicated connection to the supporting weather forecast office. The Remote Display is funded by FAA, and maintenance is provided by NWS.
Integrated Terminal Weather System	FAA's Integrated Terminal Weather System furnishes air traffic controllers and meteorologists with full-color graphic displays of weather information concerning airport terminal airspace within a 60-mile radius. The system also projects movement of severe weather systems up to 1 hour in the future and has been installed at 22 airports.
Corridor Integrated Weather System	FAA's Corridor Integrated Weather System is a prototype decision support tool that gathers weather information occurring along the Northeast air traffic corridor to help controllers select the most efficient routes for diverting traffic to avoid severe weather conditions. This system provides traffic flow managers with comprehensive convective weather data needed for tactical modifications, occurring within 2 hours, to the operational plan. These tactical modifications to the operational plan may include the weather impacts on air traffic control capacity, a need to modify the mitigation plan, and the execution of a modified mitigation plan.

Source: GAO analysis of FAA and NWS data.

NWS meteorologists at the en route centers provide several products and services to the FAA staff, including meteorological impact statements, center weather advisories, periodic briefings, and on-demand consultations. These products and services are described in table 3. In addition, center weather service unit meteorologists can provide input every 2 hours to the Aviation Weather Center's creation of the Collaborative Convective Forecast Product, train FAA personnel on how to interpret weather information and, if warranted, provide weather briefings to nearby terminal radar approach control facilities.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00310 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Table 3: Key Products and Services Provided by Center Weather Service Units

Product or service	Description
Meteorological impact statement	An unscheduled forecast of weather conditions that are expected to adversely impact the flow of air traffic in the en route center's area of responsibility within 4 to 12 hours.
Center weather advisory	A short-term, unscheduled warning of hazardous weather conditions used primarily by air crews to anticipate and avoid adverse weather conditions in the en route and terminal environments. It describes current weather conditions or adverse weather conditions—such as moderate to severe icing or turbulence, thunderstorms, and low ceilings and visibility—beginning within the next 2 hours.
Briefings	Short updates provided by en route center meteorologists to FAA supervisors twice a day; they include current weather advisories, a summary of the predicted weather in the en route area, terminal forecasts, and jet stream and freezing information.
On-demand consultation	Unscheduled verbal presentations provided to traffic management controllers, supervisors, and other FAA facilities within the en route center area. Consultations may be about the expected weather conditions or interpretations of weather information from the satellite images.

Source: GAO analysis of FAA and NWS data.

FAA Is Seeking to Improve Aviation Weather Services Provided at En Route Centers

In recent years, FAA has undertaken multiple initiatives to assess and improve the performance of the center weather service units.[5] Studies conducted in 2003 and 2006 highlighted concerns with NWS's weather service units while FAA's more recent initiatives have sought solutions.

In November 2003, FAA performed a study of the performance of the weather service units and found that the services provided at different en route locations were inconsistent, the products were not standardized, and there was little communication and collaboration between neighboring service units. Additionally, in January 2006, FAA initiated an analysis of the value of different activities performed by the center weather service units. Similar to the 2003 study, the results of this analysis noted the lack of standardization of products, services, tools, and procedures. In addition, the report found that quality assurance was provided on an informal basis, there was no formal feedback process for products and services, and meteorological training was not standardized.

[5] FAA is also involved in a longer term initiative to increase the efficiency of the national airspace system and to improve its overall safety. This initiative, called the Next Generation Air Transportation System, is a joint effort between Department of Transportation, the National Aeronautics and Space Administration, the White House Office of Science and Technology Policy, and the Departments of Homeland Security, Defense, and Commerce. FAA anticipates that this initiative may lead to major changes in the aviation weather program that would supercede its current efforts.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00311 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

To address these concerns, FAA undertook several initiatives. In September 2005, FAA requested that NWS restructure its aviation weather services to provide improved services more efficiently. FAA also contracted for an analysis of whether weather information could be remotely delivered to air traffic controllers. The subsequent report[3] confirmed that it would be possible for weather information, products, and services to be delivered to customers at the en route centers from one or many remote locations with currently available state of the art technology platforms. Following up on this information, in October 2006, FAA administered a market survey to determine whether the private sector could provide remote weather services at a lower cost than currently provided. Ten organizations, including private sector firms and government-funded laboratories, responded that they could provide the services that FAA wanted.

NWS's Plans for Restructuring Its Center Weather Service Units Are on Hold

NWS developed a proposal to address FAA's request for more efficient center weather service, but any plans for restructuring the center weather service units are currently on hold. When FAA requested that NWS restructure its aviation weather services, the agency asked NWS to consolidate 20 of the service units (excluding the service unit in Alaska) to a smaller number of sites, reduce related NWS personnel costs by 20 percent, and deliver forecast products and services 24 hours a day, 7 days a week. Subsequently, NWS chartered a prototype team to evaluate approaches for providing services to FAA and to prepare a proposal for modernizing the national aviation weather program.

In August 2006, the NWS team conducted a prototype in which center weather service unit products and services were completed and delivered remotely from the closest weather forecast office. This prototype showed that remote operations were possible and effective, but that they would be difficult to implement because of the need for cultural change, technology upgrades, and communication stability. Specifically, forecasters in the prototype were not able to provide dedicated support for the aviation mission because their other duties—including forecasting severe weather at the weather forecast office—took precedence. In addition, a collaboration technology used during the prototype was not operationally ready-to-use, servers were unstable, critical radar data were inconsistent

[3]Federal Aviation Administration, *Center Weather Service Unit Post-Operational Study* (Washington, D.C.: 2006).

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00312 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

with weather forecast office data, and communications lines were unstable throughout the prototype. In spite of these difficulties, in October 2006, NWS presented its proposal for restructuring its aviation weather services to FAA.

In April 2007, FAA declined NWS's proposal. FAA officials explained that NWS's proposal was not viable because it did not consolidate the offices to a smaller number of sites and it involved higher training costs. Instead, FAA reported that it would redefine its requirements for the functions provided by the center weather service units. Officials stated that once FAA's requirements are more clearly defined, NWS may revise its proposal or consider other alternative organizational structures to deliver those requirements.

FAA Finds Its Existing Requirements Are Not Sufficiently Precise and Is Developing New Ones; Agency Has Not Ruled Out Private Industry Sources

FAA considers its existing requirements governing NWS's center weather service units to be too broad to ensure the efficiency and cost-effectiveness of the services, and has therefore worked for several months to redefine its requirements. By September 2007, the agency had developed draft requirements that specified activities and performance measures. In late December 2007, after we completed our review, FAA finalized a more expansive set of requirements. It expects NWS to respond within 120 days as to whether they are able to meet the requirements. If NWS is unable to fulfill the new requirements, FAA has stated that it will consider using alternative sources from private industry or government laboratories to obtain the weather services necessary to meet its requirements.

FAA's Existing Requirements for NWS Services Are Imprecise

FAA's existing requirements for the center weather service units are broadly outlined in an interagency agreement that is updated every few years. The interagency agreement specifies that NWS is to provide meteorological advice and consultation to en route center operations personnel and other designated FAA air traffic facilities within the en route area of responsibility.[a] This agreement establishes specific terms that govern the number of NWS staff, their working hours, and cost reimbursement details. It does not specify the contents, quality, or frequency of weather products.

[a]In December 2007, FAA and NWS signed an interagency agreement that will be effective for 21 months, with an option for one additional year.

An NWS directive, signed in May 2006 and intended for NWS's weather forecast offices and center weather service units, provides more specific information regarding the content of weather products, including daily briefings, meteorological impact statements, and center weather advisories. Specifically, a service unit's briefings are to contain sufficient information for air traffic controllers to make decisions and appropriate operational adjustments based on weather impacts, including a discussion of advisories in effect, weather systems and their movements within the en route center area, flight conditions (including convective weather, turbulence, and icing), weather conditions for large airports (including heavy snow, freezing precipitation, and low visibility), wind direction and speed, and any other locally required items. The service unit's meteorological impact statements are to detail weather conditions expected to adversely impact air traffic flow in the service unit area of responsibility and should include the location, height, extent, and movement of the weather conditions. In addition, the center weather advisories may include forecasts of conditions expected to begin within 2 hours of issuance. Center weather advisories typically include the issuance time, the time the meteorologist expects the condition to begin, other weather advisories that are augmented by the center weather advisory, and the location and a brief description of the weather phenomenon.

FAA Is Redefining Its Requirements

In April 2007, FAA's Air Traffic Organization began refining its requirements for aviation weather services at the en route centers. To do this, FAA collected all related NWS and FAA orders and directives and developed a list of over 100 products and services that the different service units provide. FAA then sent this list to traffic managers in each of the en route centers, asking them to specify the products and services that they need, the ones they do not need, and any new products or services that they would like. Traffic managers were also able to specify whether they needed some of the more customized weather products that are currently available at selected en route centers.

Using results from this survey, FAA developed a list of approximately 47 products and services. Examples of products and services include conducting scheduled briefings, developing local turbulence and icing forecasts, and issuing products such as the meteorological impact statement and the center weather advisory. In commenting on a draft of this report, FAA noted that it finalized a more expansive set of requirements on December 19, 2007.

NWS will have 120 days to respond as to whether they are able to meet the requirements outlined in the final requirements document. Also, FAA plans to request that NWS respond to different assumptions, including having aviation weather services provided at the current en route center locations, having aviation weather services provided at an off-site location, and potentially having a hybrid approach.

FAA May Consider Alternative Sources for Weather Service Support

FAA officials within the Air Traffic Organization stated that they are not currently considering private industry sources for weather services at en route centers, but that they may do so in the future. FAA officials stated that until NWS responds as to whether and how it can fulfill the revised FAA requirements, it is premature to consider alternative sources. However, FAA has stated that if NWS cannot meet the refined requirements, it will consider taking steps to procure weather services from alternative sources. While acknowledging that NWS is not directed to be the exclusive provider of weather products and services to FAA, NWS's Senior Counsel stated that the Secretary of Commerce is required to provide meteorological reports, such as those provided by the center weather service units, to persons engaged in civil aeronautics.[7] He stated that if NWS cannot meet FAA's requirements, FAA and NWS should enter into negotiations.

Neither NWS Nor FAA Ensure the Quality of Aviation Weather Services at En Route Centers

While interagency agreements between NWS and FAA state that both agencies have responsibilities for assuring and controlling the quality of aviation weather observations, neither NWS nor FAA consistently do so for weather products produced at the en route centers. Leading organizations use quality assurance to provide staff and management with objective insights into processes and associated work products.[8] Generally, quality assurance includes objectively evaluating performed processes, work products, and services against applicable process descriptions, standards, and procedures; identifying and documenting noncompliance issues; providing feedback to project staff and managers on the results of quality assurance activities; and ensuring that

[7] 49 U.S.C. § 44720.

[8] The Carnegie Mellon University's Software Engineering Institute is recognized for its expertise in software and system processes. See Carnegie Mellon University Software Engineering Institute, *Capability Maturity Model® Integration for Development, Version 1.2* (Pittsburgh, PA: August 2006).

noncompliance issues are addressed. However, neither NWS nor FAA has developed performance measures and metrics, regularly evaluated weather service unit performance, or provided feedback to improve these aviation weather products and services.

Because of this lack of performance tracking and oversight, NWS cannot demonstrate the quality or value of its services, and FAA cannot ensure the value of the services it funds. As a result, it is not clear that FAA is getting the information it needs to effectively manage air travel. FAA officials stated that they intend to establish performance measures for their redefined requirements and to improve their oversight against these measures. However, at present, FAA has not worked with NWS to define a comprehensive set of measures for its requirements, and it is unclear how the agency would develop a performance baseline for comparison to actual performance because many of the products and services have not previously been measured.

NWS Does Not Measure or Evaluate Aviation Weather Products and Services at En Route Centers

NWS does not measure or evaluate the aviation weather services it provides at en route centers. Under existing interagency agreements, NWS is responsible for controlling the quality of its aviation weather observations. Specifically, NWS is responsible for monitoring and evaluating the quality and effectiveness of its aviation weather services, including the services provided at the weather forecast offices, the Aviation Weather Center, and the en route centers.

While NWS has developed and continues to monitor performance measures for aviation weather forecasts provided by its weather forecast offices and the Aviation Weather Center, the agency has not done so for the weather products and services provided at the en route centers. Specifically, NWS has not developed performance measures for aviation weather products and services at en route centers, evaluated the aviation weather products and services developed at the en route centers, or provided feedback for those services. NOAA and NWS officials declined to explain why the agency does not have performance measures for aviation weather products or services at en route centers, but they noted that neither FAA nor NWS have required or funded such an effort. Further, the aviation services branch chief told us that he had planned to begin evaluations for aviation weather services at the en route centers but decided to wait because of the potential for large-scale changes to the services.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00316 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Until NWS establishes performance measures and evaluates the quality and effectiveness of its products against these measures, the agency will remain unable to ensure that it provides consistent quality products and to effectively demonstrate the value it provides to FAA.

FAA Does Not Consistently Evaluate or Provide Feedback on Aviation Weather Services at En Route Centers

FAA has not consistently evaluated NWS services at its en route centers or adequately provided feedback on the results of its few evaluations. Under interagency agreements, FAA is responsible for ensuring that aviation weather services meet its requirements. In addition, it requires the traffic management officer within each traffic management unit to evaluate the aviation weather services at the en route centers annually and to provide feedback to the resident meteorologist-in-charge.

FAA has not consistently ensured the quality of aviation weather services at en route centers. Specifically, it currently does not have any quantitative and objective performance measures—such as timeliness, accuracy, or false alarm rate—by which to evaluate these services. Agreements between the agencies broadly specify the types of aviation weather products to be developed at the en route centers but do not provide criteria by which these products can be evaluated. In addition, FAA has not consistently performed its annual evaluations of these products and services. According to the contracting officer's technical representative responsible for the evaluations, the last evaluation was performed in 2006, and its results were largely anecdotal. Specifically, the evaluation called for the traffic management officer to rate the service unit on a scale of 0 to 4 in different categories, including quality and timeliness of products and services, knowledge of air traffic control, and participation in training. The technical representative told us that he could not find any evaluations in 2005, evaluations of only three service units in 2004, and evaluations of a similarly small number of service units in 2003.

Further, FAA is not consistently providing feedback to weather staff at the en route centers. According to the technical representative, the evaluations from 2006 were not compiled or analyzed because the evaluations contained no glaring problems or issues that needed additional attention. In addition, the NWS aviation services branch chief told us that FAA had sent him copies of the evaluations from 2006 but did not offer analysis of these evaluations, express concerns about the services, or send the results to the individual center weather service units. This official also stated that he was not aware that FAA had performed any annual evaluations of the center weather service units prior to 2006.

Because FAA has not established performance requirements or consistently and thoroughly evaluated the aviation weather services at en route centers, the agency cannot be sure that the products and services provided by the center weather service unit meteorologists are adding value, and they cannot provide feedback to these meteorologists in order to improve the services. To address this shortfall, FAA officials stated that they intend to establish performance measures for aviation weather services at en route centers when they revise their requirements and to improve their oversight of NWS against these measures. However, FAA has not worked with NWS to develop measures for the products and services it will require from NWS, and it is unclear how the agency would develop a performance baseline for comparison to actual performance because many of the products and services have not previously been measured.

Conclusions

In seeking to improve the aviation weather services provided at its en route centers, FAA asked NWS to develop a proposal for restructuring its organization to provide weather services more efficiently. NWS subsequently presented a proposal for providing weather services remotely, but FAA declined this proposal, stating that it would revise and reaffirm its requirements before deciding how to proceed. FAA also noted that if NWS is unable to meet FAA's needs, it will consider alternative sources including private industry.

Assessing the value and effectiveness of current weather service products provided at en route centers is difficult because neither NWS nor FAA monitors the accuracy and quality of these aviation weather products. Specifically, NWS has not established performance measures for aviation weather products and services provided at the en route centers, evaluated these products and services, or provided feedback on them. FAA has not specified what level of performance it needs, consistently evaluated the aviation weather services at en route centers, or provided NWS feedback on how to improve its services. While FAA plans to include performance measures when it defines its new requirements, it has not worked with NWS to develop a set of measures, and it is not clear how the agency would develop baseline performance for comparison. Until the agencies establish a system of performance tracking and oversight, NWS will not be able to demonstrate the quality or value of its services, and FAA will not be able to ensure the value of the services it funds. Without knowing the quality of the aviation weather services used at en route centers across the country, FAA may not be getting the information it needs to effectively manage air travel.

Recommendations for Executive Action

While many steps remain in defining the future of aviation weather services at en route centers—including negotiations between FAA and NWS on the provision of these services and FAA's subsequent decision on whether to obtain selected services from alternative sources—there are steps both agencies can take to ensure that the quality of future aviation weather products and services are measured and evaluated. We are making two recommendations to the Secretary of Commerce and three recommendations to the Secretary of Transportation to improve the quality of aviation weather products and services at en route centers.

We recommend that the Secretary of Commerce direct the Assistant Administrator for the National Weather Service to

- assist FAA in developing performance measures and metrics for the products and services to be provided by center weather service units, and
- perform annual evaluations of aviation weather services provided at en route centers and provide feedback to the center weather service units.

Further, we recommend that the Secretary of the Department of Transportation direct the FAA Administrator to

- work with NWS to define performance measures and metrics for aviation weather services provided by meteorologists,
- evaluate the services it receives against those measures and metrics, and
- ensure that results of these evaluations are provided to staff stationed at center weather service units so that they can improve performance, where applicable.

Agency Comments and Our Evaluation

The Department of Commerce provided written comments on a draft of this report (see app. II). In the department's response, the Secretary of Commerce agreed with our recommendations to assist FAA in developing performance measures and metrics, and to perform annual evaluations of aviation weather services and provide feedback to the center weather service units. The department stated that after FAA provides its revised requirements NOAA would work with FAA to develop methods for performance monitoring and evaluation. Subsequently, on December 19, 2007, FAA provided its revised requirements to NWS.

The Department of Transportation's Director of Audit Relations provided comments on a draft of this report via e-mail. In those comments, the department did not agree or disagree with our recommendations. The department stated that FAA's revised requirements are consistent with our recommendations in that they establish performance measures and evaluation procedures, and that FAA would begin to negotiate with NWS to implement them.

In its December 2007 requirements document, FAA identified several new requirements for aviation weather. Specifically, the document calls for expanding the scope of the center weather service units to monitor the entire national airspace system, rather than the respective en route center regions. This national scope is expected to allow more integrated decision making at the national level while continuing to provide specialized products at the regional and local levels. The revised requirements also define new products and services, such as providing weather forecasts for terminal radar approach control facilities, increasing weather coverage from 16 hours a day to 24 hours a day, and enhancing the standardization of products among center weather service units. FAA also calls for NWS to prepare three operational concepts for fulfilling the requirements—in its existing configuration located at the 21 en route centers, through remote services provided by a reduced number of regional facilities, and through remote services provided by a single centralized facility.

In addition to these requirements, FAA identifies performance measures, as well as processes for evaluating performance and providing feedback to the forecasters. However, the department did not involve NWS in developing its performance measures and did not leverage NWS's expertise in measuring the accuracy, timeliness, and quality of its weather products and services. As a result, the measures may not reflect the leading expertise in measuring the performance of weather forecasters. Thus, we reiterate our recommendation that FAA and NWS work together to establish and monitor performance measures.

Both departments also provided technical comments that we incorporated as appropriate.

As we agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to interested congressional committees, the Secretary of Commerce, the Secretary of Transportation, the Director of the Office of Management and Budget, and

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00320 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

other interested parties. In addition, this report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you have any questions about this report, please contact me at (202) 512-9286 or by e-mail at pownerd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.

David A. Powner

David A. Powner
Director, Information Technology
Management Issues

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00321 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

List of Requesters

The Honorable Nick Lampson
Chairman
The Honorable Bob Inglis
Ranking Member
Subcommittee on Energy and Environment
Committee on Science and Technology
House of Representatives

The Honorable Mark Udall
Chairman
The Honorable Tom Feeney
Ranking Member
Subcommittee on Space and Aeronautics
Committee on Science and Technology
House of Representatives

The Honorable Jerry Costello
Chairman
Subcommittee on Aviation
Committee on Transportation and Infrastructure
House of Representatives

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00322 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix I: Objectives, Scope, and Methodology

Our objectives were to (1) determine the status of the National Weather Service's (NWS) plans for restructuring the offices that provide aviation weather services at en route centers, (2) identify the Federal Aviation Administration's (FAA) requirements and its alternative sources for these services, and (3) evaluate the agencies' abilities to ensure the consistency and quality of these services.

To determine the status of NWS's plans for restructuring aviation weather services, we reviewed agency plans for restructuring its aviation weather services, including prototype plans and results, service unit survey results, and plans for addressing FAA's requirements. We also interviewed NWS officials to obtain clarifications on these plans.

To identify FAA's requirements and its alternative sources for these services, we reviewed historical requirements documents, including the memorandum of understanding, interagency agreement, and NWS orders regarding center weather service unit products and services; documentation of requirements from FAA; responses from the market study performed by FAA; and legislation regarding aviation weather services. We compared FAA's current requirements development processes with best practices for developing and validating requirements by the Carnegie Mellon University Software Engineering Institute's Capability Maturity Model® Integration for Development.[1] We also interviewed agency officials and employees who were involved in the requirements gathering process.

To evaluate the agencies' abilities to ensure the consistency and quality of these services, we reviewed agency documentation that governs aviation weather, including the memorandum of understanding, interagency agreement, and NWS orders. We also reviewed results from the most recent FAA evaluation of the center weather service units. We compared these documents with best practices for quality assurance from the Capability Maturity Model® Integration for Development. In addition, we interviewed FAA officials responsible for evaluations of aviation weather services, FAA and NWS en route center staff to obtain information on evaluations and feedback; and NOAA's Global Systems Division

[1] Carnegie Mellon University Software Engineering Institute, *Capability Maturity Model® Integration for Development, Version 1.2* (Pittsburgh, PA: August 2006). Capability Maturity Model® and Capability Maturity Modeling are registered in the U.S. Patent and Trademark Office. CMM is a service mark of Carnegie Mellon University.

representatives responsible for verifying certain aviation weather products.

We performed our work at FAA and NWS headquarters offices, FAA's Potomac Consolidated Terminal Radar Approach Control facility, FAA's Air Traffic Control System Command Center, and the Dulles air traffic control tower in the Washington, D.C., metropolitan area. In addition, we conducted work at four FAA en route center offices in Leesburg, Virginia; Denver, Colorado; Dallas, Texas; and Cleveland, Ohio, because they were geographically dispersed and were identified by NWS officials as some of the stronger and weaker weather service units. We also performed observations and interviews at NOAA's Global Systems Division offices in Boulder, Colorado, because of their expertise in verifying aviation weather products, and NWS's Aviation Weather Center in Kansas City, Missouri, because of its responsibilities for aviation weather forecasts—some of which are supplemented by the center weather service units. We conducted this performance audit from May 2007 to December 2007, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for findings and conclusions based on our audit objectives.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00324 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix II: Comments from the Department of Commerce

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

December 18, 2007

Mr. David A. Powner
Director, Information Technology
Management Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

Dear Mr. Powner:

Thank you for the opportunity to review and comment on the Government Accountability Office's draft report entitled *Aviation Weather: FAA Is Reevaluating Services at Key Centers; Both FAA and the National Weather Service Need to Better Ensure Product Quality* (GAO-08-258). I enclose the Department of Commerce's comments on the draft report.

Sincerely,

Carlos M. Gutierrez

Enclosure

Department of Commerce's
Comments on the Draft GAO Report Entitled
"Aviation Weather: FAA is Reevaluating Services at Key Centers; Both FAA and the National Weather Service Need to Better Ensure Product Quality"
(GAO-08-258/January 2008)

General Comments

The Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) appreciates the opportunity to review this report on aviation weather. The report does a fair and thorough job in assessing the status of the National Weather Service's plans for restructuring offices providing aviation weather services at the Federal Aviation Administration's (FAA) en route centers and evaluating current abilities to ensure the consistency and quality of these services.

NOAA Response to GAO Recommendations

Recommendation 1: "We recommend that the Secretary of Commerce direct the Assistant Administrator for the National Weather Service to assist FAA in developing performance measures and metrics for the products and services to be provided to center weather service units."

NOAA Response: NOAA agrees with this recommendation. As indicated in the report, the FAA is redefining its requirements for products and services to be performed by meteorologists at en route centers. When the FAA provides its finalized requirements, NOAA will work with them to develop performance measures and metrics for the Center Weather Service Unit products and services. Subsequent collaboration between NOAA and the FAA should lead to a shared service level agreement on milestones, performance measures, and goals.

Recommendation 2: "We recommend that the Secretary of Commerce direct the Assistant Administrator for the National Weather Service to perform annual evaluations of aviation weather services provided at en route centers and provide feedback to the center weather service units."

NOAA Response: NOAA agrees with this recommendation. NOAA will work with the FAA to develop methods for performance monitoring and evaluation based upon the FAA's service requirements (see the response to Recommendation 1). These methods will involve annual evaluations, at a minimum.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00326 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

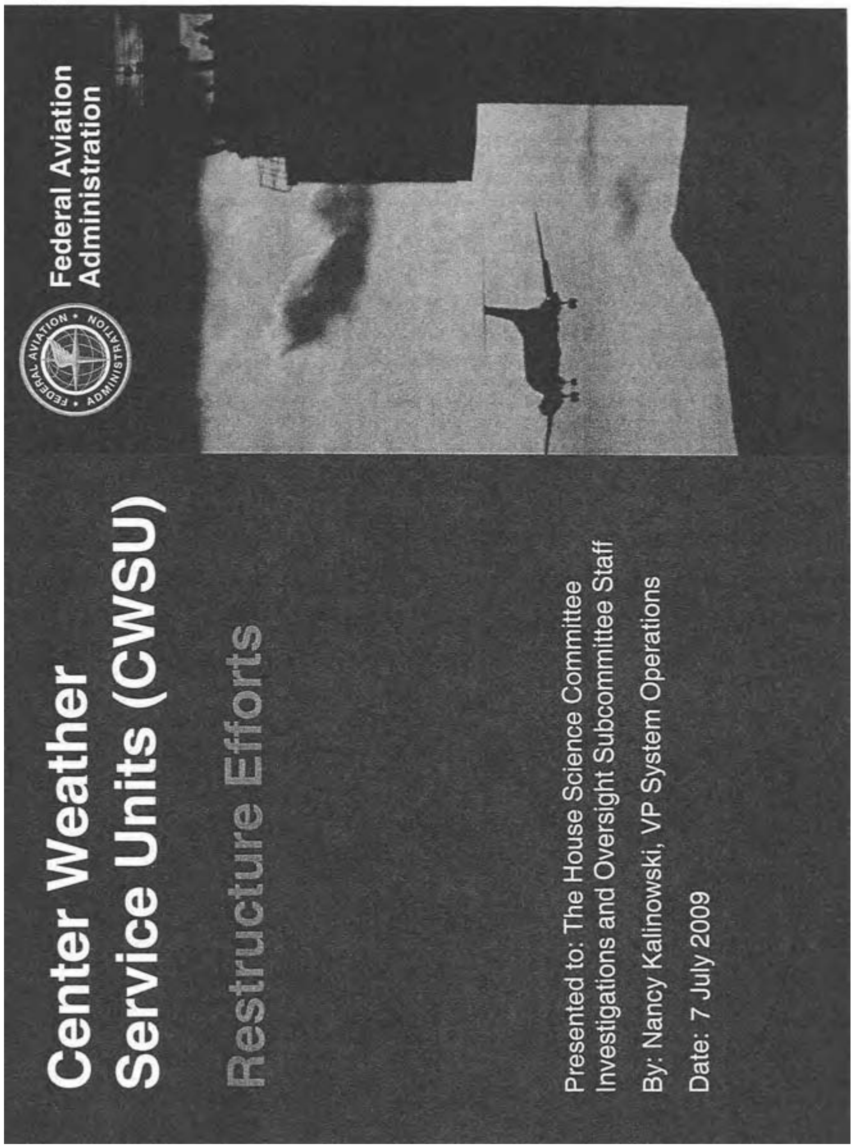
David A. Powner, (202) 512-9286, or pownerd@gao.gov

Staff Acknowledgments

In addition to the contact person named above, Colleen Phillips, Assistant Director; Kate Agatone; Monica Perez Anatalio; Neil Doherty; Nalani Fraser; Amos Tevelow; and Jessica Waselkow made key contributions to this report.

GAO's Mission	The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.
Obtaining Copies of GAO Reports and Testimony	The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "E-mail Updates."
Order by Mail or Phone	The first copy of each printed report is free. Additional copies are $2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to: U.S. Government Accountability Office 441 G Street NW, Room LM Washington, DC 20548 To order by Phone: Voice: (202) 512-6000 TDD: (202) 512-2537 Fax: (202) 512-6061
To Report Fraud, Waste, and Abuse in Federal Programs	Contact: Web site: www.gao.gov/fraudnet/fraudnet.htm E-mail: fraudnet@gao.gov Automated answering system: (800) 424-5454 or (202) 512-7470
Congressional Relations	Gloria Jarmon, Managing Director, jarmong@gao.gov, (202) 512-4400 U.S. Government Accountability Office, 441 G Street NW, Room 7125 Washington, DC 20548
Public Affairs	Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800 U.S. Government Accountability Office, 441 G Street NW, Room 7149 Washington, DC 20548

#13


Federal Aviation Administration
Center Weather Service Units (CWSU)
Restructure Efforts
Presented to: The House Science Committee Investigations and Oversight Subcommittee Staff
By: Nancy Kalinowski, VP System Operations
Date: 7 July 2009

Beginning of CWSUs

- **National Transportation Safety Board (NTSB) recommendation issued October, 1977**
  - Federal Aviation Administration (FAA) develop rules and procedures for timely dissemination by Air Traffic Controllers of severe weather information to inbound and outbound flight crews in the terminal area
- **Addressing the recommendation in 1978, the FAA worked out an agreement with the National Weather Service (NWS) to place meteorologists (4) in each Air Route Traffic Control Center**
  - Inter-Agency (IA) Agreement reimburses NWS for 84 meteorologists
  - FAA also pays for CWSU hardware and software
- **IA has been renewed several times since 1978 and current IA is due to expire 30 September, 2009**

Federal Aviation Administration 2

CWSU Operations Today

- Tasked to provide FAA operations personnel weather information that has potential impact on air traffic operations 16 hours/day, 7 days/week
- Provide scheduled and un-scheduled weather briefings
- Issue unscheduled products based on weather in the ARTCC domain
  - Meteorological Impact Statements (MIS)
  - Center Weather Advisories (CWA)
- CWSU meteorologists work with the Traffic Management Unit, provide management briefings and updates on expected weather in the en-route service area, and occasionally interact with en-route controllers

Federal Aviation Administration 3

Why Looking at Change?

- **FAA, as a performance based organization, evaluates business practices for improvements and potential efficiency gains**
- **Since CWSU began 30 years ago, technology has presented new ways to produce, disseminate and use weather information**
  - FAA has developed and fielded automated weather equipment and information that is available to Air Traffic Controllers
- **Most global aviation weather operations both in Government and Private Sector have consolidated with no degradation in services**
  - FAA pulsed private sector in 2006: responses indicated can do CWSU like work from more centralized operation saving ~50% cost
- **Documented performance issues with CWSU over many years (latest with GAO 2008 report)**
- **IA expires September 2009 (it has one-year extension available)**

Federal Aviation Administration 4

WX Technology: 1978

- Controller display systems (scopes) showed air traffic no weather information was included
- Controllers depended on others to tell them the weather
- Weather info, air traffic control was regionally oriented
- The Internet did not exist
- Teleconferencing was not available
- Commercial aviation weather service providers very limited

Federal Aviation Administration

5

1970s equipment unable to display weather.

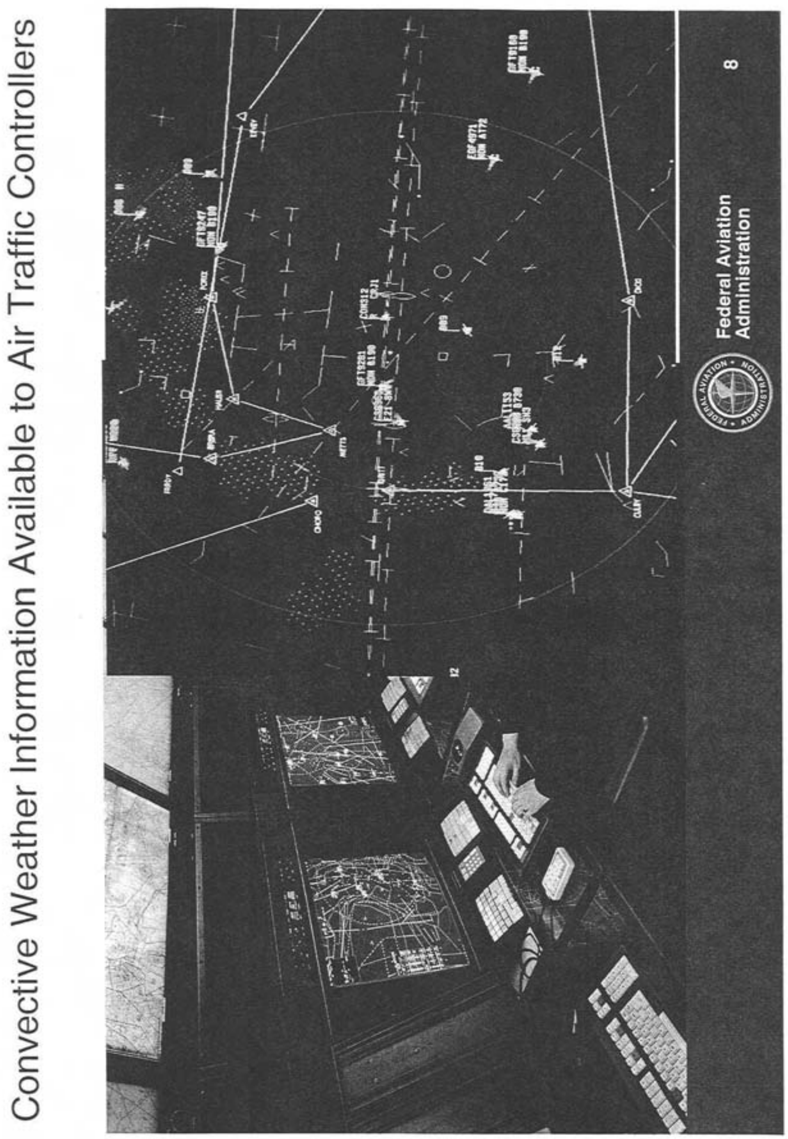
Federal Aviation Administration

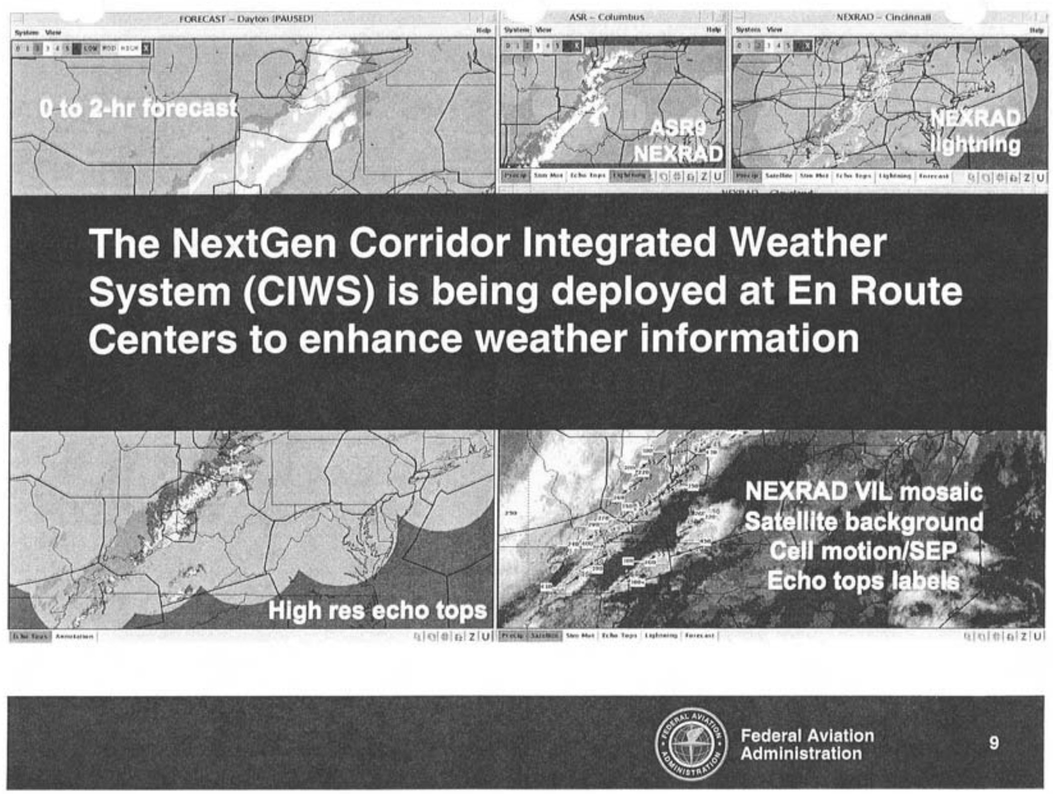
6

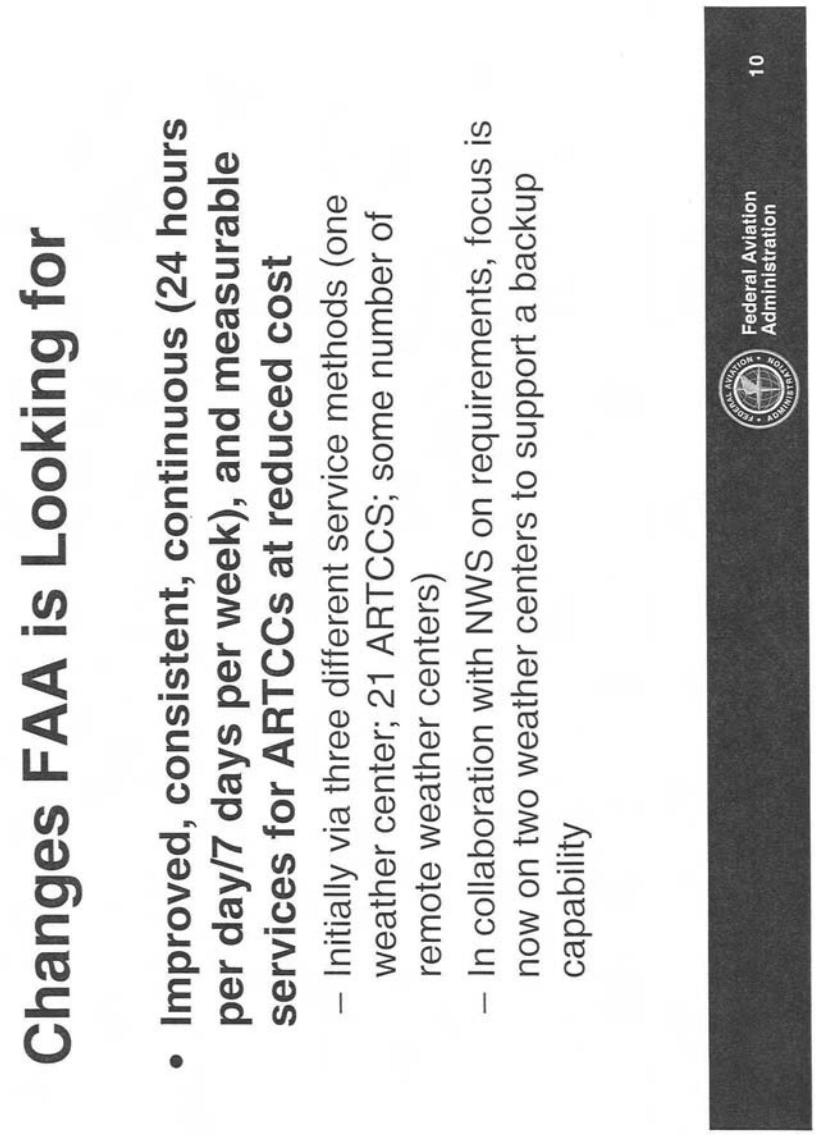
Today-Weather Information Available to Controllers

- **Technology has developed to the point where the NTSB's recommendation of over 30 years ago is being addressed to include having weather capabilities provided to the terminal controller**
- **Since 1977, FAA has had several programs support the provision of weather information to controllers- examples include:**
  - WARP: Weather radar displays on ARTCC controller scopes
  - AWOS/ASOS Data Acquisition System: Distributes minute by minute surface weather observations
  - Next Generation Runway Visual Range: Real time measurement of visibility conditions on a runway available to controllers
  - ITWS and CIWS: Real-time forecasts for terminal and en-route areas

Federal Aviation Administration 7


Convective Weather Information Available to Air Traffic Controllers
Federal Aviation Administration
8


FORECAST – Dayton (PAUSED)
ASR – Columbus
NEXRAD – Cincinnati
0 to 2-hr forecast
ASR9
NEXRAD
NEXRAD
lightning
The NextGen Corridor Integrated Weather System (CIWS) is being deployed at En Route Centers to enhance weather information
High res echo tops
NEXRAD VIL mosaic
Satellite background
Cell motion/SEP
Echo tops labels
Federal Aviation Administration
9


Changes FAA is Looking for
• Improved, consistent, continuous (24 hours per day/7 days per week), and measurable services for ARTCCs at reduced cost
– Initially via three different service methods (one weather center; 21 ARTCCS; some number of remote weather centers)
– In collaboration with NWS on requirements, focus is now on two weather centers to support a backup capability
Federal Aviation Administration
10

CWSUs: Current vs Proposed Solution

	Current	Proposed
Service Provider	NWS	NWS
Coverage	16 hrs/ 7 days	24 hrs/ 7 days
FAA Facilities Covered	21 Centers	21 Centers + 10 Major TRACONS
NWS Staffed Facilities	21	2
Common View of Weather	No	Yes

Federal Aviation Administration

11

The Future: NextGen WX

- **NextGen infrastructure will transform how we view weather**
  - All members of the aviation community—pilots, airports, air traffic controllers—will share a common view of the National Airspace System (NAS)
  - An integrated system will show weather, aircraft flight plans and aircraft trajectories overlaid together on the same display
  - Convective weather information will be real time
  - NextGen infrastructure will be a network-based, data-sharing environment

Federal Aviation Administration

12

NextGen Weather Connections

- Key concept of NextGen is a Common Operational Picture (COP) and Single Authoritative Source of weather information for ATM decisions
- The COP overcomes inconsistencies in weather information often found today between different forecast offices when weather is changing and critical to aviation
- For NWS to produce COP in timely manner FAA believes this will take a more centralized approach and CWSU restructure could be looked at as a first phase to NextGen

Federal Aviation Administration 13

Addressing NWSEO and NATCA Concerns

- FAA believes change will create a more safe and responsive operation as CWSU coverage expands from 16 hours/7 days per week to 24 hours/7 days per week with more meteorologists available to focus on weather impacting air traffic operations
- FAA will ensure no degradation of service and that safety is not compromised by addressing operational changes through the Safety Management System
  - A demonstration and validation of any change will be performed and independently reviewed prior to any change being implemented (FAA desires NTSB to be involved in review)
- NWS will continue to maintain, at any one time, over 125 meteorologists responsible for providing meteorological watch and forecasts for parts of the National Airspace System through it's Weather Forecast Offices and the Aviation Weather Center

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00342 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

Safety

- **Providing broader dissemination of weather information in terms of daily coverage and number of facilities included enhances safety**
- **To ensure we do not introduce more risk into the system, the FAA will,**
  - Prototype the proposed solution,
  - Work with the NTSB to ensure we are still addressing their recommendation
  - Implement a Safety Management System analysis to assess risk

Federal Aviation Administration

15

CWSU Proposal Status

- **NWS provided to FAA in early June 2009**
- **Next Steps**
  - FAA team assessing CWSU proposal and plans to complete it by early August 2009
  - FAA will re-engage with the NWS upon completion of assessment

#14

FEDERALTIMES.com

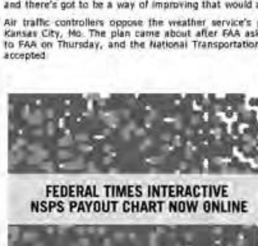
Some worried about plan to cut airport meteorologists

A plan to cut the number of weather experts serving U.S. airports by nearly a third and house the remaining ones in two national centers is being touted as progressive and cost-efficient by federal officials, but it's making some air traffic controllers and aviation experts nervous.

The system of posting weather experts at 21 sites nationwide began after a crash in 1977 was blamed partly on poor weather data. Now, however, the Federal Aviation Administration and the National Weather Service say Internet systems, including instant messaging, make all those weather stations unnecessary.

"Why do things the same way we did 30 years ago?" asked Elizabeth Isham Cory, a spokeswoman for FAA, which has partnered with the weather service since 1978. "There have been a lot of changes in technology, and there's got to be a way of improving that would also be more cost-effective."

Air traffic controllers oppose the weather service's plan to consolidate centers in College Park, Md., and Kansas City, Mo. The plan came about after FAA asked the agency for cost-cutting ideas. The plan is due to FAA on Thursday, and the National Transportation Safety Board will have the final say on whether it is accepted.



Some think the cuts and the sudden loss of face-to-face communications between air traffic controllers and weather experts will compromise safety.

"At this time, I don't think the technology is mature enough," said Chien-tsung Lu, who teaches aviation technology at Purdue University. "Sometimes people want to replace humans with machines, but sometimes humans are not replaceable."

The proposal would mean clearing out as many as 30 meteorologists from the Air Route Traffic Control Centers across the country. The regional centers control airspace over several states, and at each, four meteorologists work alongside air traffic controllers during the peak flying hours of 6 a.m. to 10 p.m. EST.

They are experts in wind patterns and icing conditions at 10,000 to 40,000 feet, where planes fly. They also work separately from airport control towers, where another group of controllers handles takeoffs and landings.

The center in Indianapolis is responsible for airspace over portions of Illinois, Indiana, Ohio, West Virginia, Virginia, Kentucky and Tennessee. More than 6,000 flights crisscross the region every day.

Thomas Thompson, an air traffic controller at Indianapolis International Airport, said having weather experts nearby is invaluable.

"We're not pros at reading radar like they are," he said. "They have access to what the upper winds are doing."

Sometimes such information is needed urgently, he said. "We've had aircraft with icing (on the wings), and the meteorologists can tell him where to go to get the ice thawed. They might say, 'Climb several thousand feet,' or 'Descend several thousand feet.' "

If meteorologists are several states away instead of several yards away, "the safety has been reduced," Thompson said.

The weather agency denies its plan is dangerous.

"This won't have any effect on the safety of air travel," spokesman Christopher Vaccaro said.

He said the information between meteorologists and air traffic controllers would flow just as easily through technology.

"The Internet, Web-based briefings, even instant messaging — there are a number of new tools," Vaccaro said.

Lu, the Purdue aviation expert, pointed out that the cost savings would be small. Thirty meteorologists' salaries are peanuts next to the salaries of 14,000 air traffic controllers, he said. Meteorologists can earn $80,000 to $100,000 per year.

"The same amount of work with less people," said Casey Crosbie, an Indianapolis meteorologist who opposes the plan. "It just doesn't work out."

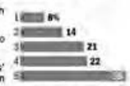
Will Higgins writes for the Indianapolis Star.

Tell us what you think. E-mail *Federal Times*.

Most Recent Poll

Energy waste

Thirty-five percent of respondents to a FederalTimes.com poll regarding their agency's energy usage said the agency was "highly wasteful" with its energy use. On a scale of 1 to 5, 1 was not wasteful and 5 was highly wasteful.



See All Poll Results

#15

To watch videos, you need a newer version of **Flash.**

After you install Flash, you may need to restart your browser.
Copy the URL first, so that you can find your way back.

Get ADOBE FLASH PLAYER

If you cannot install the latest version of Flash, you may be able to view videos on our **legacy player page.**

Text A A A

FAA Plan Panned By Bay Area Air Traffic Controllers

Posted: 10:31 pm PST February 20, 2009
Updated: 11:08 pm PST February 20, 2009

SAN FRANCISCO -- Air traffic controllers in the Bay Area said a proposed cost-cutting move by the Federal Aviation Administration is a very bad idea. The FAA wants to eliminate regional weather forecasters at air traffic control centers around the country and consolidate their jobs at two centralized locations: one in Kansas City and the other in Maryland.

Air Traffic Controller Scott Conde said, "If you were to pick the single worst climate... spot to build an major airport your [illegible] to take the weather forecasters and move them to Maryland is inherently bad idea."

The FAA's [illegible] said the proposal is about reducing costs. He issued this statement: "This is not a safety issue, and safety will not be compromised. The FAA and the National Weather Service are simply looking at ways to improve weather information while reducing taxpayer dollars."

Passengers at SFO on Friday night were not convinced it's a good plan. Joel Singh of Belmont said "Pilots already complain that this is one of the hardest airports to fly into. I think we should make it as safe as possible." "Why would they do that? Wouldn't we need someone to check the weather here?," asked Brandee Arrow of San Francisco.

Scott Conde went on to argue, "Are you comfortable getting on that plane knowing the weather deciding if ice will be on the wings is generated by somebody in an office in Maryland, or the guy here on the ground."

Conde is president of the National Air Traffic Controllers Association here in the Bay Area. He said that on-site forecasters know the Bay Area micro-climates like no one else. And they are available anytime to answer questions. Conde suggested that someone in Maryland or Kansas City doesn't know what tule fog is, or the convective fog particular to San Francisco.

The FAA said the National Transportation Safety Board also will review the proposal but the FAA will have the final word.

More Headlines

Political News »

FOXRENO.com's Political Page is a one-stop place for the latest in Nevada and national politics. **Full Story »**

Federal Political News »

Eye On Washington
Watch Eye On Washington with Marilee Joyce on Fox 11, Sunday's at 7 am. **Full Story »**

Most Popular

Stories | Videos | Slideshows

- **SWAT Teams Patrol Streets After Deadly Richmond Night**
- **BART Officials Say Progress Made In Contract Talks**
- **Native American Remains Found Near the Oakland Estuary**
- **Salinas Cop Facing Felony Rape Charges**
- **San Jose Police Capture Alleged Bank Robbers**

#16

Office of the Chairman

National Transportation Safety Board

Washington, D.C. 20594

JUL 1 6 2009

The Honorable Brad Miller
Chairman
Subcommittee on Investigations and Oversight
Committee on Science and Technology
U.S. House of Representatives
B-374 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Miller:

As a result of the April 4, 1977, Southern Airways accident at New Hope, Georgia, the National Transportation Safety Board (NTSB) issued several safety recommendations to the Federal Aviation Administration (FAA), including the following:

> Expedite the development and implementation of an aviation weather subsystem for both en route and terminal area environments, which is capable of providing a real-time display of either precipitation or turbulence, or both and which includes a multiple-intensity classification scheme. Transmit this information to pilots either via the controller as a safety advisory or via an electronic data link. A-77-63
>
> Establish a standard scale of thunderstorm intensity based on the National Weather Service's six-level scale and promote its widespread use as a common language to describe thunderstorm precipitation intensity. Additionally, indoctrinate pilots and air traffic control personnel in the use of this system. A-77-64
>
> Transmit SIGMETs [significant meteorological information] more frequently on navaids [navigational aids] so that pilots can receive more timely information about hazardous weather. A-77-65
>
> Formulate rules and procedures for the timely dissemination by air traffic controllers of all available severe weather information to inbound and outbound flightcrews in the terminal area. A-77-68

In response to those recommendations, the FAA created and installed Central Weather Service Units (CWSUs) in each of the Air Route Traffic Control Centers (ARTCC).

After the June 1, 1999, American Airlines accident at Little Rock, Arkansas, the NTSB issued Safety Recommendation A-01-71 to the National Weather Service (NWS), which specifically mentioned CWSUs and stated the following:

> In cooperation with the FAA, ensure that Central Weather Service Units are adequately staffed at all times when any significant weather is forecast. A-01-71

Beginning in 2003, the NTSB became aware of the FAA's proposal to consolidate CWSUs. Between 2004 and the present, the NTSB has hosted and attended several briefings relevant to the CWSU issue, including the FAA, the NWS and the National Weather Service Employees Organization. In addition, the Chairman of the NTSB and the NTSB Director of the Office of Aviation Safety have responded to several letters soliciting the NTSB's opinion or seeking support with regard to the proposed consolidation.

In every instance, the NTSB has reaffirmed its belief in the concept of timely and accurate meteorological information and dissemination and its support of the CWSU concept, which originated from the earlier NTSB recommendations. Although the proposed consolidation contains positive elements, such as 24/7 operational staffing, standardization between units, and improved training, the NTSB has stated its concerns regarding lack of staffing at the majority of ARTCCs and the lack of face-to-face interaction between meteorologists and controllers. The NTSB has been consistent in stating that it would continue to monitor the CWSU consolidation plan and would withhold judgment on its merits until the proposed plan has been finalized. At that time, the NTSB, if necessary, will issue appropriate safety recommendations.

I hope you find this information helpful. Thank you for your interest in aviation safety.

Sincerely,

Mark V. Rosenker
Acting Chairman

cc: The Honorable Paul Broun, Jr., M.D.
Ranking Member

#17

CWSU Site Review
Indianapolis, IN (ZID)
February 3-4, 2009

Attendees:
NWS: Dean Gulezian, Director, Eastern Region
Fred McMullen, Regional Aviation Meteorologist, Eastern Region
Cynthia Abelman, Aviation Weather Services Branch

FAA: Kevin Johnston, FAA Senior Meteorologist

This is the first Site Review for CWSU ZID and will serve as a baseline for CWSU ZID.

Shifts: 5:30 AM – 1:00 PM; 1:00 PM – 9:00 PM

Result: Baseline Review

Observations:
Observations of the CWSU meteorologists during the Site Review showed satisfactory interaction between the meteorologists and the Traffic Management Unit (TMU). The ZID TMU emphasizes weather and weather impact on traffic management as evidenced by the excellent working relationship between the TMU and CWSU and the numerous Weather and RADAR Processors (WARP) weather briefing terminals on the control room floor with weather information displayed for controllers at all times.

Both scheduled briefings, one morning and one afternoon, were brief and provided adequate information on the Air Route Traffic Control Center (ARTCC) weather conditions. In addition to general weather conditions, the meteorologists provided forecasts, based upon the existing TAFs, for those terminals which affect the ZID airspace including Chicago O'Hare, Atlanta, and Charlotte.

- Finding 1:
  - CWSU meteorologists use multiple systems to disseminate their products. CWAs are generated using the Google CWA tool, entered into AISR. A copy then goes to the Flight Data Controller to enter on the Host system for internal dissemination. MISs are not disseminated internally at the ARTCC.
  -
- Recommendation 1a:
  - CWSUs should have a single entry point for product dissemination to improve efficiency.
  -
- Recommendation 1b:
-
  - The current format of the MIS should be evaluated to improve utility by TMU.
  -

- Finding 2:
  - PIREPs are entered by FAA's Flight Data Controller, but the CWSU meteorologists solicit PIREPs from the control room floor when necessary. This is considered a best practice as it allows CWSU meteorologists to focus on weather support to the TMU.

- Finding 3:
  - CWSU uses multiple WARP briefing terminals to provide weather information. The CWSU meteorologist generates briefing slides for the stand-up briefings using WARP. These briefing slides are also viewed on numerous WARP briefing terminals on the control room floor. This is considered a best practice as it provides pertinent, timely weather information to the control room floor.

- Finding 4:
  - CWSU meteorologists will occasionally provide weather forecasts for terminals outside their area of responsibility which differ from the TAF. When the information differs from the TAF, inconsistent weather information is provided to the TMU.
  -

- Recommendation 4:
  - To eliminate inconsistent weather information, CWSU meteorologists should ensure they contact the responsible WFO when they perceive a need for a different forecast. After collaborating, the CWSU and/or WFO meteorologists should make the appropriate changes and amend the TAF if necessary. These contacts and the results should be logged in the shift log.

Interviews
The CWSU Site Review Team interviewed three TMU representatives and one Terminal Radar Approach Control (TRACON) TMU representative.

The representatives provided excellent insight into the working relationship between the CWSU and the TMU. The TMU relies heavily on the CWSU meteorologist expertise, especially during the convective season. In addition to their weather duties, the ARTCC Training Manager expressed gratitude for the exceptional support he receives from the CWSU meteorologists with controller weather training.

- Finding 1:
  - TMU does not rely on Corridor Integrated Weather System (CIWS) for convective forecast.

- Finding 2:
  - CWSU meteorologists provide significant support for controller weather training by supplementing nationally-produced weather training. The meteorologist's enthusiasm for the weather and training create a great learning

environment and controllers retain more information. This is considered a best practice and should be encouraged at all CWSUs.

- Finding 3:
  - The TRACON contacts the CWSU more frequently than the CWSU contacts the TRACON. The TMU representative mentioned the CWSU service was proactive and the CWSU is sensitive to their needs especially with winds; but they do call the CWSU more frequently than they are contacted by the CWSU.

- Recommendation 3:
  - The CWSU should work to anticipate the needs of their Operational Evolution Partnership (OEP) TRACON.

CWSU Site Review
Los Angeles, CA (ZLA)
February 11-12, 2009

Attendees:
NWS: Lynn Maximuk, Director, Central Region
Paul Witsaman, Regional Aviation Meteorologist, Southern Region
Michael Graf, Aviation Services Branch NWS Headquarters
Mark Jackson, Meteorologist In Charge, Oxnard Weather Forecast Office

FAA: Kevin Johnston, FAA Senior Meteorologist, System Operations

This is the first Site Review for CWSU ZLA and will help set a national CWSU baseline.

Shifts: 5:30 AM – 1:00 PM; 1:00 PM – 9:00 PM

Observations:
The total observation time was limited with a majority of attention given to interviews throughout the first day. The group observed a ground stop initiative put into play and watched the meteorologist go through their routine duties. Overall, our observations revealed broad-based support and satisfaction from the TMU. There were a few instances when coordination and situational awareness by the CWSU could have been better attuned to TMU needs.

The overall style and presentation of the stand up briefing was good, but the WARP briefing slides are hard to view from a distance. In addition, the meteorologist provided forecasts for the TMU regarding winds at Las Vegas. While the TMU was satisfied with the CWSU support, from the team's perspective, interaction with the Command Center lacked a sense of urgency. The CWSU met the requirement of National Weather Service Instruction 10-803, but still has opportunities to enhance services to the Command Center, TRACONs, and the Towers.

Finding 1

CWSU meets the needs of their TMU as evidenced by 8 interviews from the TMU and observations from the team. Based on observation of routine duties, CWSU and the NWS can invest in other methods to aid overall situational awareness for the FAA facilities.

Recommendation 1

CWSU could use MIS or another type of presentation to provide specific weather information for TRACONs and Towers. The product would need to be coordinated and will likely evolve until both parties agree on content and delivery. The CWSU and NWS should work with the TMU to investigate possible products and delivery mechanisms to assist TRACONs and Towers.

Finding 2

The CWSU does not have access to real-time traffic displays such as Traffic Situation Displays (TSD) in their operations area. Currently, they use the WSD but the auto-update function does not appear to work. Also, access to real-time (1 minute) ASOS data is not available.

Recommendation 2

The NWS should work with the FAA to supply TSD data to the CWSU. The TSD is a flight path tool residing in the TFMS application and allows the CCFP to be overlaid and automatically updated. The TSD CWSU situational awareness would be boosted by the use of this display. CWSU MIC should work with the TMU to check on the viability of this recommendation.

Finding 3

CWSU uses WARP exclusively to provide morning and afternoon briefings. This eases their production time and provides consistency to the briefs. A web-based graphics form of a briefing should be used to improve the effectiveness of the briefings.

Recommendation 3

NWS and FAA should investigate avenues where web-based briefings can be incorporated into the weather brief for better, clearer depictions of the weather. In the short term, NWS needs to contact the WARP Program Office to see if clearer graphics can be added to the WARP briefing terminal.

Finding 4

The AISR is used by the CWSU to enter PIREPS received from the ARTCC control room for external dissemination when they are on shift. Urgent PIREP dissemination for FAA facilities is performed by the Weather Coordinator who monitors received urgent PIREPs and re-disseminates them to FAA facilities

Recommendation 4

The NWS should work with the FAA to address the inability of ERIDS to disseminate PIREPs long line which could streamline PIREP entry by disseminating to both internal and external systems.

Finding 5

TMU does not provide any feedback on CWSU products and/or recommendations that initiate GDPs.

Recommendation 5

The NWS and FAA should work together to make feedback part of their daily routine and determine a method to track decision-making based upon CWSU input.

Finding 6

Forecasters appeared to assign equal importance to routine tasks and fast-breaking weather changes. The CWSU could better emphasize the problem of the day in their daily routine and be more pro-active rather than reactive.

Recommendation 6

CWSU should consider possible problems of the day as they move through their routine duties and be proactive in providing weather information.

Finding 7

Some CWSU forecasters have limited or no understanding of the BUFKIT software. Solid forecaster tools such as BUFKIT for vertical analysis etc should be part of the forecast process.

Recommendation 7

The WFO should assist the CWSU with understanding BUFKIT with localized training.

Finding 8

TMU does not have Corridor Integrated Weather System (CIWS) for convective forecast.

Finding 9

MIS is rarely utilized.

Recommendation 9

The NWS should assess the utility of the MIS message and work with the FAA to determine more effective content.

Finding 10

CWSU needs to work with supporting WFOs on the TAF collaboration product. Per 10-803, "The CWSU and WFO MICs should agree to the content, and level of detail provided in the collaboration process, and keep documentation of that agreement in their respective offices.

Recommendation 10

CWSU MIC should work with the affected MICs on the content and detail level of this product.

Finding 11:

During the evaluation, one controller complained about not having a phone number to contact the CWSU concerning a PIREP.

Recommendation 11a

FAA CEDAR system should be used to clarify CWSU contacts, responsibilities, etc. CEDAR is the FAA training portal where the CWSU staff can provide training in a web based environment.

Recommendation 11b

CWSU meteorologists should have additional customer service training.

Finding 12

CWSU MIC had to go to great lengths to get the ARD on backup power. The current system was never delivered with a UPS and the. WFO ended up supplying it.

Recommendation 12

The NWS should work with the FAA to determine whether the CWSU Interagency Agreement can be adjusted to require FAA facilities connect the CWSU systems to critical power.

Finding 13:

The early morning rush with getting products completed could be alleviated with an earlier start time.

Recommendation 13

CWSU should work with the TMO to determine the most effective start time for the CWSUs.

Finding 14

CWSU does not have access to Vegas TDWR.

Recommendation 14

NWSH/WR/WFO LOX need to analyze the WFO/CWSU ARD setup. Possible options…

1. Configure the host workstation at Oxnard to have the Vegas localization - which should include the TDWR data. This should allow for the ZLA ARD system to display the localized Vegas D2D and TDWR data via. This would require some work on Oxnards' part to setup the localization and would require that the ZLA ARD use remote shell. This could be the fastest method with the least amount of cost/impact
2. If the ZLA ARD is configured for remote NFS/Rsync, then spending money on upgrading the existing COMMS may be a better choice. This would improve comms for the current operations and allow for the increased datasets from Vegas. The local workstation would be able to display the D2D data from Oxnard and Vegas fine and additional workstation not likely necessary. Disk space would need to be reviewed to ensure it was adequate. However, cost of additional workstation insignificant compared to additional cost of comms.

ARTCC Interviews:

The CWSU Site Review Team interviewed five ARTCC managers.

The ARTCC representatives provided valuable insight into the working relationship between the CWSU and the Center. Each person interviewed praised the products and services from the CWSU. The following are results of the interviews:

Operations Managers

- TMU gets information on Icing and Turbulence, OMIC probably needs to be more in the loop. But otherwise very satisfied.
- CWSU varies in degree of being pro-active, can tell which Met is on duty by amount of info. Otherwise thinks the CWSU is outstanding.
- Need to clarify backup when CWSU is not present.

Traffic Management Unit

- Very proactive unit and satisfied with service
- Very satisfied with service, but would be nice for office to open at 5am
- Wants to improve the clutter suppression they tend to get

ARTCC QA Manager

QA is part of the ARTCC which is part of ATO Enroute & Oceanic Operations. The TMU/CWSU is not under the line of command of the ATO Enroute. They are in their own ATO division called System Operations. That's why the ARTCC QA isn't involved in QA'ing the TMU versus CWSU services with respect to GDPs.

Las Vegas/SoCal TRACON Interviews

The CWSU Site Review Team remotely (telephone) interviewed the Las Vegas TRACON. The interview results:

- Need more pro-active information on corridors and routes
- Would like outlooks for the next day if possible…currently CWSU provides weekend outlooks
- Would like more climatology on fog etc.
- Would like to interact more with CWSU and Las Vegas WFO…perhaps quarterly visits…question on who would fund though

The following are additional observations:

- AVNFPS runs locally for TAF monitoring

CWSU Site Review
Atlanta, GA (ZTL)
February 24-25, 2009

Attendees:
NWS: Robert Tibi, Director, Western Region
Scott Birch, Regional Aviation Meteorologist, Western Region
Michael Graf, Aviation Services Branch, NWS Headquarters
Lans Rothfusz, Meteorologist in Charge, Atlanta Weather Forecast Office

FAA: Kevin Johnston, FAA Senior Meteorologist, System Operations

This is the first Site Review for CWSU ZTL and will serve as a baseline for all CWSUs.

Shifts: 5:30 AM – 1:30 PM; 1:15 PM – 9:15 PM

Observations:
Observations of the CWSU meteorologists during the Site Review demonstrated an integrated weather unit with the complete confidence and support of the TMU. The review showed a highly motivated and well trained CWSU staff. Their interaction with the TMU is a model of how a CWSU should operate. This CWSU meets and exceeds the intent of National Weather Service Instruction (NWSI) 10-803.

- Finding 1

  The pro-activeness and good communication skills of the CWSU MIC and staff are the strengths of this unit. They are seamlessly integrated into the TMU and the TMU treats the CWSU staff as their own. CWSU ZTL is physically located inside the TMU.

- Finding 2

  The CWSU staff produces a briefing slide (Tactical Decision Aid (TDA)) that incorporates the weather synopsis, surface chart, ATL/CLT TAFs, thunderstorm forecasts for the arrival/departure gates at both TRACONs, and compression winds (wind profile) for both TRACONs (example in Appendix A). This product is used as a strategic planning tool for the ARTCC TMU, TRACONs, and Towers. This product is considered a best practice since it is popular with customers and provides weather commonality to all the traffic management decision makers. See appendix A.

Recommendation 2

The NWS should work with the FAA to provide the requirements for TRACON TDAs to the NWS leadership.

Finding 3

The CWSU uses the FAA Traffic Situation Display (TSD) for operations. The CCFP and CWIS can be overlaid on this display, improving the situational awareness of the CWSU. The convenience and availability of the TSD to the CWSU should be considered a best practice.

Finding 4

CWSU has a FAA PC where the CEDAR platform can be accessed and updated. CEDAR is the FAA network calendar and training portal used by the CWSU staff to provide training to the FAA in a web based environment. Furthermore, the CWSU can obtain FAA training and information from CEDAR. This use of CEDAR is considered a best practice since it allows both FAA and CWSU personnel the ability to receive training on a standard platform and environment.

Finding 5

PIREP dissemination is accomplished through multiple systems and by multiple individuals in the ARTCC. The PIREP is first transmitted from the pilot to the controller. The controller then gives a paper copy of the PIREP to the CWSU for entering into the AISR system. Lastly, the CWSU hands the PIREP to the Weather Coordinator or TMU so it can be entered in the ARTCC host computer. The cumbersome nature of PIREP dissemination could delay PIREP transmission especially during busy weather and/or traffic periods.

Recommendation 5a

The NWS should work with the FAA to investigate PIREP dissemination to alleviate multiple entry points and systems. The ERIDs system is a potential fix for this problem since it disseminates the PIREP longline, enters it into the ARTCC host computer for the facility, and notifies the CWSU of the observation for meteorological watch.

Recommendation 5b

The NWS should work with the FAA to clarify the requirement for PIREP responsibility and investigate the potential of ERIDs for PIREPs dissemination.

Finding 6

The TMU uses the EURAT system. This system provides controllers with upper level winds and is based off the Global Forecast System Rapid Update Cycle (RUC).

Finding 7

The CWSU provides winds for TRACON compression issues that are also developed from the RUC. This forecast method, developed by the Seattle CWSU, ensures consistency between products. CWSU Atlanta has incorporated compression TDAs into their operations to support their TRACONs. The vertical wind profiles are color coded for significant winds and highlight the potential compression areas. This is considered a best practice since it utilizes current technology to help the TMU and TRACONs to stay ahead of the power curve and be proactive with respect to forecasted weather.

Recommendation 7a

NWS should partner with FAA to populate the FAA weather website at the Command Center with data like the compression TDA. Use of the FAA Command Center website mitigates security issues between the two organizations and helps increase situational awareness for FAA facilities.

Recommendation 7b

NWS and FAA should open lines of communication and evaluate the current suite of NWS products. They should consider what currently best fits the Command Center's philosophy of a common operating picture and use that information as a baseline to investigate other NWS resources that can be brought into the FAA weather website.

Finding 8

FAA CIWS is available in the CWSU workspace. This equipment gives CWSU meteorologists the ability to monitor weather information being displayed on CWIS. On occasion, CWIS will over forecast weather radar information, and the CWSU staff will relay the correct information to the TMU. The strengths of having a CWIS in the CWSU operations area is TMU/CWSU commonality, and utilizing CWSU expertise on weather radar interpretation.

Finding 9

The CWSU has been instrumental in showing the usefulness of the Camtasia recorded briefings. The staff uses Power Point weather slides to build their recorded Camtasia briefings, and this allows controllers the ability to listen to the daily weather briefing at a later time. The Camtasia briefings are developed three times per day for both the Atlanta and Charlotte TRACONs. This is listed as a best practice because it allows the CWSU to reach a wider audience outside of the ARTCC. The FAA facility training staff saw the utility of this software, and they are incorporating Camtasia into their training as well.

Finding 10:

The CWSU staff uses the same format for briefing slides for all stand-up briefings which provides uniformity to the briefings. The CWSU incorporates WARP products for speed and convenience. The downside to using WARP products is some slides are very difficult to read. In addition, the CWSU has been instructed by the ARTCC to limit the weather briefing to three minutes. This causes the meteorologists to rush, even on benign weather days, so that all standard slides are included.

Recommendation 10a

NWS and FAA should investigate avenues where web based briefings can be incorporated into the weather briefing for better, clearer depictions of the weather. Also, time limits on weather briefing should be discouraged since the briefings are hurried and most importantly, there is insufficient time to address weather concerns during high impact weather events.

Recommendation 10b

NWS should contact the WARP program office and check if additional images that better meet the needs of the CWSU briefing can be added.

Finding 11:

The MIC at WFO Peachtree, GA has moved the aviation program lead responsibilities and title from the WFO to the CWSU MIC. This unique configuration has led to several positive outcomes:1) Better integration at the WFO of the nuances that negatively affect the TMU, making the WFO more sensitive to timely TAF amendments; 2) Increased communication between the WFO and CWSU; and 3) Enhanced support for the relationship and teamwork between the two offices. Though this practice may not work for all sites due to travel and other considerations, it's an effective use of the CWSU MIC skill set and enhances communications between the WFO and CWSU.

Finding 12:

Slant range visibility can, at times, have a big impact on the TMU operations.

Recommendation 12

FAA and NWS should research available tools to help CWSUs to better forecast this phenomenon.

Finding 13

FAA perceives the 6-hour TAF updates as old information after 3-4 hours and believes the TAFs are not updated in a timely manner.

Recommendation 13

NWS should investigate the possibility of 3-hour TAF updates for the 35 OEP airports. ASB will work with the various Regional Aviation Meteorologists to investigate the feasibility of 3-hour TAF updates for the 35 OEP airports.

Finding 14

The weather coordinator function is not standard at all 21 ARTCCs and this contributes to non standard services at all CWSUs. The ZTL weather coordinator duties are shared by the CWSU and the TMU.

Recommendation 14

The NWS should work with the FAA to clarify the weather coordinator function and standardize the duties at all 21 ARTCCs.

Finding 15

Numerous FAA personnel interviewed stated they would like the CWSU to open earlier in the morning, before 5:30 am. Opening earlier would impact the

CWSU's ability to support nighttime convection and high impact weather in the evening as long as 16x7 coverage is requested.

Recommendation 15

The CWSU should continue to discuss hours of operations with the FAA and consider changes to hours of operations in the future.

ARTCC Interviews:

The CWSU Site Review Team interviewed four ARTCC representatives , Ed Clone; Joe Hambrite, Geoffrey Lelliott and Ron Crebes.

The ARTCC representatives provided valuable insight into the working relationship between the CWSU and the Center. Each person interviewed praised the products and services from the CWSU. The following are results of the interviews:

Operations Manager

- Relies on thunderstorm forecasting to plan en route staffing
- CWSU forecasts "are ahead of the curve" and consistent

Traffic Management Unit

- CWSU is a top notch team that anticipates runway changes (wind shifts), and seeks out information on ARTCC operations to improve CWSU operations
- ZTL weather forecasts are consistent with other NWS products
- CWSU forecasts "are more correct then Delta"
- Typically the weather coordinator is working in the TMU area 24 hours a day, but the job is not assigned to one individual per se, but rather the shift duty is tasked to the person that's least busy.

Atlanta TRACON Interview

The CWSU Site Review Team interviewed Tim Helms from the Atlanta TRACON TMU by telepohone. Frequent, excellent interaction occurs between the TRACON and CWSU, and the TMU considers the CWSU products and services as valuable. The interview results:

- Severe weather information is timely
- Meteorologists are proactive with information especially with icing impacts
- The TRACON Camtasia briefing and TAF TDA are effective
- On occasion, wind shift occurs sooner than anticipated by CWSU
- No face-face outreach visits have been conducted from the CWSU and WFO since at least November

Charlotte TRACON Interview

The CWSU Site Review Team interviewed Jeff Burke, Supervisory Traffic Management Coordinator, from the Charlotte TRACON TMU via the telephone. The following are results of the interviews:

- The internet based products from the CWSU are invaluable
- The biggest weather problem traditionally is fog in the morning
- The TRACON Camtasia briefings and the convective TDAs are not used
- A more accurate CCFP is required

Atlanta Tower Interview

The CWSU Site Review Team interviewed Gary Henry, Supervisory Traffic Management Coordinator, Atlanta Air Traffic Control Tower, by telephone. The Atlanta ATCT uses the internet to access a variety of weather information. The following are answers to the review team questions:

- The CWSU is good at forecasting wind shifts
- The TRACON TDA web page will not refresh on occasion in the Tower. The CWSU does fax the TDA to the Tower as a backup, and so far the NWS and FAA ITO folks have been unable to determine the cause of the lack of web page refresh
- The ATCT prefers multiple forecasts from different suppliers even when the forecast are not consistent, and they give more "weight" to the CWSU forecast
- The ATCT would like more frequent interaction with the CWSU during thunderstorms and wind shifts, and feels the TAFs are not updated enough

The following are additional observations from the review:

- CWSU uses WARP exclusively to produce graphical products for TMU briefs
- The telephone is the primary method for collaboration between the CWSU and WFOs
- The CWSU does not consider the OEP product useful since they coordinate the information with the WFO via a scheduled teleconference. WFO Peach Tree has not used the OEP product for enough time to evaluate the usefulness of the product for their operations
- AVNFPS runs locally for TAF monitoring
- The NWS CWSU Short Term Improvement Plan provided a cordless phone for the CWSU which has been a benefit to the staff. No other Improvement Plan items were considered a benefit to the unit
- The CWSU MIC attends the WFO managers meeting every other week
- The CWSU staff will work their supernumerary shifts on the WFO aviation weather desk during severe weather outbreaks to help the WFO manage the workload and also provide an additional forecaster to focus solely on the TAFs.

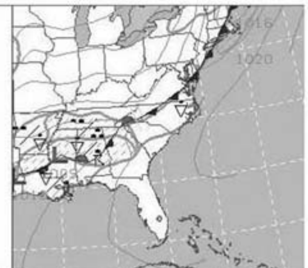
Appendix A

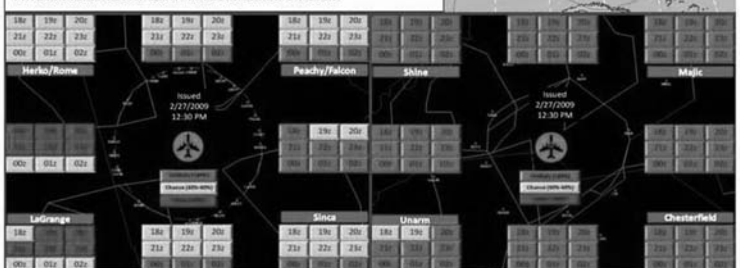
ZTL Weather Bulletin

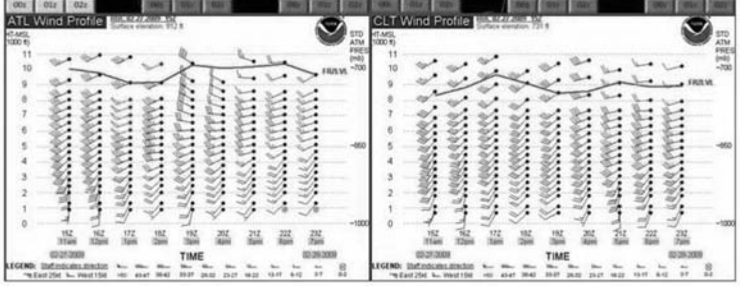
Prepared 2/27/2009 12:49 PM By: KF Valid for 9 Hours **FOR ATC PLANNING PURPOSES ONLY**

An approaching cold front will move into the forecast area tonight and stall. South to southwest flow ahead of the front will pull moisture over the area. Showers will become widespread by 22z and continue overnight. Widespread MVFR and IFR in +SHRA/TSRA. Hazards outside convection: Expect light to occasional moderate rime or mixed icing between 120-FL220 in cloud. Also expect light to occasional moderate turbulence below 150. Altimeters will remain above 29.92ins but lowering through the period as low pressure develops along the front treks east. Ceilings below 050 are expected in ZTL all areas.

KATL 2718/2824 19008KT 6SM -RA FEW005 SCT025 OVC035
TEMPO 2718/2722 VRB12G25KT 3SM +TSRA BR SCT005
BKN015 OVC025CB
FM280000 15008KT 3SM -RA BR BKN007 OVC015CB
PROB30 2804/2810 2SM +TSRA BR OVC005CB
FM281000 19010KT 3SM -TSRA BR OVC005CB
FM281800 23012KT 3SM TSRA BR OVC007CB
KCLT 2718/2818 20010KT 6SM -SHRA BR SCT025 OVC050
TEMPO 2718/2721 4SM SHRA BR SCT020 BKN030
FM272100 19007KT 5SM -SHRA BR SCT015 BKN025 OVC040
FM280000 17006KT 4SM -SHRA BR SCT010 OVC018
FM280500 11005KT 3SM -DZ BR SCT008 OVC015
FM280800 07005KT 2SM -RA BR SCT003 OVC006







CWSU Site Review
Oakland, CA (ZOA)
March 10-11, 2009

Attendees:
NWS: William Proenza, Regional Director, Southern Region
Paul Witsaman, Regional Aviation Meteorologist, Southern Region
Cecilia Miner, Aviation Services Branch, NWS Headquarters
David Reynolds, Meteorologist in Charge, San Francisco Weather Forecast Office

FAA: Kevin Johnston, FAA Senior Meteorologist, System Operations

This is the first Site Review for CWSU ZOA and will help build a baseline for all CWSUs.

Shifts: 5:00 a.m. – 1:00 p.m (12Z – 20Z); 1:00 p.m. – 9:00 p.m. (20Z – 04Z)
Primary traffic pushes: 1630Z – 20Z; 01Z -04Z

Observations:
The Oakland CWSU is well integrated into the Traffic Management Unit (TMU) and receives high praise from the staff for proactive attention to ARTCC needs, careful analysis of forecast accuracy, and commitment to improvement and innovation. The Oakland Air Route Traffic Control Center (ARTCC) has an immense area of responsibility that extends across the Pacific Ocean and includes a great deal of military operations and major cyclones (tropical and otherwise). According to the Manager of System Operations, although ZOA is one of the slower areas for domestic traffic counts, the oceanic operations require about 50 percent of their staffing. To manage support to both areas, the CWSU is centrally located between the domestic and oceanic floors. This CWSU meets and exceeds the intent of National Weather Service Instruction (NWSI) 10-803.

- Finding 1

  Order ZOA 7210.6H (Attachment 1) spells out duties for the CWSU and the Weather Coordinator, specifically assigning Weather Coordinator duties for dissemination of urgent pilot reports (PIREPS) and other products on day and swing shifts. This division of labor works well for the CWSU, as it ensures the forecaster sees the latest reports. However, it was noted that the Weather Coordinator position is not standardized across all ARTCCs.

- Finding 2

  Reliance on cameras for visualizing stratus-affected areas is commendable. Provided by NASA AMES in collaboration with MIT/Lincoln Laboratory, the Stratus Initiative Camera System provides streaming video of SFO from two major vantage points, so the forecasters and traffic managers can see the runways and approaches directly. The CWSU controls the views and access; as such the views are real-time, not delayed for security. Although the setup may not work for every CWSU, this visualization could be considered a **Best Practice**. The Stratus Initiative was transitioned to NWS in 2004. An example of the camera view is shown in Figure 1.

Figure 1. View of runway end and approach at San Francisco International Airport from Stratus Initiative camera. Visuals are vital for stratus forecasts.

- Finding 3

  Also as part of the stratus initiative, the CWSU provides the latest forecast for ARTCC and airline viewing. The forecast contains a confidence estimate and a discussion of the reasoning underlying the forecast. This program is unique to ZOA and is well received by both the ARTCC and the airlines. However, Dave Reynolds, the SFO MIC, points out that there are times when the forecast contains a high probability (~90 percent) that the stratus will clear before traffic arrives. Yet the ARTCC has never canceled a Ground Delay Program (GDP) based on those high probabilities. The CWSU and WFO are working with MIT/LL to improve the display to make it more impact based, and the CWSU is collecting statistics to support the case for trusting high-probability forecasts. Kevin Johnston, the FAA Command Center representative lauded the CWSU for keeping statistics that relate to traffic management.

  Recommendation 3

  Improve awareness among ARTCC staff on use of confidence. One approach may involve periodic weather awareness sessions for ARTCC staff, which would include results, findings on CWSU forecasts, and services as well as nuances of local weather.

- Finding 4

  The CWSU keeps detailed statistics on forecast performance to support future reliance on probabilistic information (example at Attachment 2). Active collection and dissemination of performance statistics is a **Best Practice**.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00366 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- Finding 5

  The CWSU has a good working relationship with United Air Lines (UAL), which faxes airline TAFs to the CWSU. If there is a disagreement, the CWSU and UAL hold an initial telcon before the 6 a.m. planning telcon.

- Finding 6

  The CWSU and WFO have an excellent scientific relationship (**Best Practice**). As a SOO previously, the SFO MIC was instrumental in development of the stratus initiative and brings intimate working knowledge of the system and its capabilities to the ARTCC.

- Finding 7

  The CWSU uses a forecaster-developed, web-based color depiction of sectors as a real-time AIRMET/SIGMET "met watch" to verify forecasted hazards (**Best Practice**). The product correlates number, intensity, and type of Pilot Report (PIREP) to current AIRMETs and ZOA airspace sector. In addition to providing information for forecasters, the high-glance product helps supervisors see which sectors have the worst weather and which sectors need more PIREPs, especially if the sectors are currently in an AIRMET area. An example appears in Figure 2.

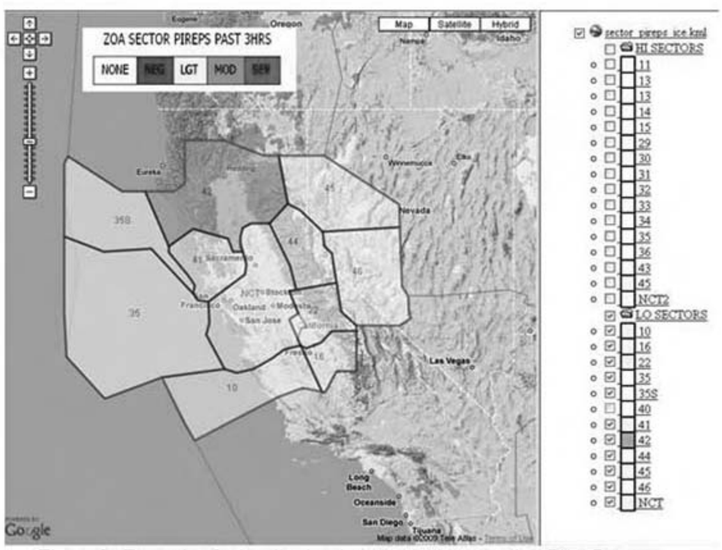


Figure 2. Example of a locally developed graphic to monitor Pilot Reports (PIREP) with respect to ARTCC airspace.

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00367 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- Finding 8

  The CWSU MIC tracks PIREPs by day, by month, and by sector for TMU managers (example in Figure 3). This **Best Practice** helps the traffic managers see which controllers are actively soliciting PIREPs, since even a "good ride" is useful information. Another great aid is the locally developed PIREP form (Figure 4, next page).

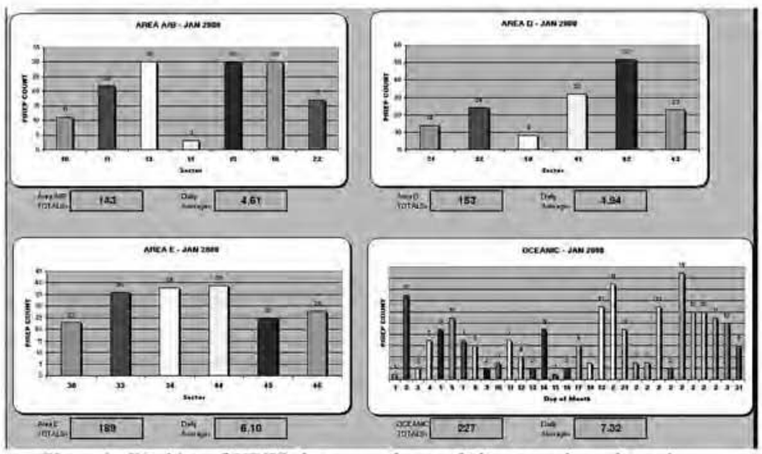


Figure 3. Tracking of PIREPs by area and sector helps supervisors determine which desks actively seek PIREPs.

- Finding 9

  The En Route Information Display System (ERIDS) is a valuable local server that allows ARTCC personnel to view NOTAMs and orders and to transmit PIREPs within the ARTCC. However, it suffers from three drawbacks: First, it has no audible alarm, so PIREPs transmitted to the CWSU ERIDS screen may go unnoticed for some period of time; second, since the system is internal, PIREPs have to be manually entered into the Aeronautical Information System Replacement (AISR) computer for dissemination beyond the ARTCC; third, there are rumors of guidance that instructs FAA personnel not to use ERIDS to enter PIREPs. Since the CWSU MIC feels strongly about getting the PIREP information for forecast verification, he does not object to the manual process, but it is time consuming.

  Recommendation 9A

  ASB follow up with Kevin Johnston to see if an audible alarm for the ERIDS can be developed to alert CWSU forecasters to incoming PIREPs.

ASB should investigate whether an audible alarm for the ERIDS can be developed to alert CWSU forecasters to incoming PIREPs.

Recommendation 9B

ASB should investigate the possibility of interfacing systems so that PIREP dissemination beyond the ARTCC does not involve manually re-typing information into multiple systems.

Recommendation 9C

ASB to check with FAA and confirm what guidance exists regarding ARTCC personnel using ERIDS to enter PIREPs.

ZOA PIREP FORM

Sector______ **Date**________

Location:

Time (UTC):

Altitude/Flight Level(s):

Aircraft Type:

Turbulence: | Wind: Direction/Velocity:________

(if reported): OCCASIONAL - CONTINUOUS - CHOP

∅NEG – LGT – MOD – SEV – EXTRM

Icing (include temperature): | Temperature (C):

(type): RIME - CLEAR - MIXED

TRACE – LIGHT – MODERATE – SEVERE

Sky Cover: BASE______TOP______FEW SCT BKN OVC

Flight Visibility & Weather: VISIBILITY:__________NM

Weather: SMOKE HAZE FOG RAIN SNOW TS Other:______

Remarks: (Plain language, SMOOTH, LLWS, MTN WAVE, +/- KTS, FT/MIN):

PIREP dissemination tracking after CWSU closed (2100L-0500L):

Called AFSS at ________UTC by________initials

ZOA AT Form 7110-2 (Rev. 1/07)

FAAO 7110.65

2-6-2. HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS)

Controllers shall advise pilots of hazardous weather that may impact operations within 150 NM of their sector or area of jurisdiction. Hazardous weather information contained in HIWAS broadcasts includes:

AIRMET -Airmen's Meteorological Information (**valid for 6-hour period**):

SIERRA: **Instrument Flight Rules (IFR) or Mountain Obscuration**
- Ceilings <1000ft and/or visibility <3nm covering 50% of the area.
- Extensive mountain obscuration

TANGO: **Turbulence**
- Moderate Turbulence
- Sustained surface winds of 30 knots or more at the surface

ZULU: **Icing**
- Moderate Icing/Freezing levels

SIGMET -Significant Meteorological Information (**valid for 4-hour period**):
Weather potentially hazardous to all aircraft other than convective activity.

Convective SIGMET (WST) (**valid for 2-hours & issued hourly at Hour+55**):
Thunderstorms with SEVERE surface weather including:
- surface winds greater than or equal to 50 knots
- hail at the surface greater than or equal to 3/4 inches in diameter
- tornadoes

A WST implies severe or greater turbulence, severe icing, and low-level wind shear conditions.

UUA -Urgent Pilot Weather Reports:
Weather phenomena reported by a pilot which represents a hazard or a potential hazard to flight operations - SEV Icing/Turbulence, LLWS, Hail, Tornados, Ash

CWA -Center Weather Advisory (**valid for 2-hour period**):
Short term advisory of hazardous weather in progress or forecast to develop.

2-6-3. PIREP INFORMATION

Significant PIREP information includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, wind shear and turbulence (including clear air turbulence) of moderate or greater intensity, volcanic eruptions and volcanic ash clouds, and other conditions pertinent to flight safety.

a. Solicit PIREPs when requested or when one of the following conditions exists or is forecast for your area of jurisdiction:

1. Ceilings at or below 5,000 feet. These PIREPs shall include cloud base/top reports when feasible.
TERMINAL. Ensure that at least one descent/climb- out PIREP, including cloud base/s, top/s, and other related phenomena, is obtained each hour.
EN ROUTE. When providing approach control services, the requirements stated in TERMINAL above apply.

2. Visibility 5nm or less (SFC or aloft)	3. Thunderstorms and related phenomena	4. Moderate Turbulence or greater
5. Any Icing	6. Wind Shear	7. Volcanic ash clouds.

ZOA AT Form 7110-2 (Rev. 1/07)

Figure 4. Locally developed form assists controllers and forecasters in collecting and disseminating PIREPs.

- Finding 10

  Continuing the theme of PIREP dissemination, if the PIREP is an Urgent PIREP, the forecaster also enters it into a Keyboard Video Display Terminal (KDVT) to tie into the Host computer that prints out strips for the controllers and transmits to Air Traffic Control Towers. The redundant entry aside, it is not clear if or how weather information will be conveyed under En Route Automation Modernization (ERAM), which will take controllers into a stripless environment.

Recommendation 10
ASB should clarify how weather information, specifically urgent PIREPs, will be conveyed under ERAM.

- Finding 11
  Host computer rejects AIRMET messages because they are too long (unlike SIGMETs). CWSU must enter through the KVDT. As with the last finding, it is not clear what changes ERAM will bring.

  Recommendation 11
  ASB contact AWC to see if AIRMETs can be shorter and have a header like a SIGMET to prevent rejection by the Host computer.

- Finding 12
  WARP upgrade announcements are not reaching the user (CWSU) in a timely manner.

  Recommendation 12
  ASB by May 31, 2009, should ensure WARP changes are announced directly to the CWSU with copy to ASB.

- Finding 13
  The CWSU has a great website, but since it is not in an FAA domain, it is not being seen by all the internal users.

  Recommendation 13
  ASB should investigate web interface for all internal ARTCC users.

- Finding 14
  The interview with the ARTCC manager revealed a need for earlier support from the CWSU.

  Recommendation 14
  ASB follow up with CWSU on possible scheduling techniques to accommodate ARTCC needs.

- Observation: There were no local products (CWA/MIS) archived for the period of the visit. AIRMET/SIGMET products generated for the airspace appear at Attachment 3.

ARTCC Interviews:

The following supplements the checklists from NWSI 10-814, which appear as Attachment 4.

The CWSU Site Review Team interviewed four ARTCC representatives. Additional information is contained in the CWSU Site Review checklist.

- Manager, Systems Operations, Oakland ARTCC, Western Service Area
  - FAA, outside of traffic management and the ARTCCs, don't appreciate the value of on-site meteorologists for decision support.
  - The CWSU has a higher degree of accuracy for bases, tops, frontal passage and rain (yes/no).
  - The TAF is necessary for the terminal, but the ARTCC also needs information on the approaches.
  - The CCFP is far too broad for ZOA ARTCC, and convection is a relatively rare event in the San Francisco area, though they are concerned by convection over the Sierra Nevada. The ARTCC values local expertise for stratus forecasting, which is the primary issue. The CWSU forecasters have a higher degree of accuracy than the primary airline forecasters for stratus forecasts and than the CCFP for convection.
  - The ARTCC could use CWSU help earlier, say, with a 4 a.m. arrival rather than 5 a.m. to allow additional analysis time and to have a product ready at 5:15 a.m. for ground delay program planning.
  - The review team asked if 24/7 operations would be useful. The Manager responded in the negative except for special weather events since SFO has little traffic from 10 p.m. to 4 a.m.
  - Stated that CWSU services delivered face to face are more effective

- Supervisor Traffic Management Coordinator (STMC)
  Traffic Management Specialist (TMS)
  - Performance ranges from excellent to average at times. The STMC prefers information push rather than pull, especially when the weather is bad (wants proactive help, e.g., face to face).
  - Forecasts tend to be good, but communication could be improved in some cases. In general, CWSU accuracy is better than that provided by airline meteorologists. The TMS added that he liked the objectivity of CWSU forecasts, since they are independent of airline.
  - The STMC likes the forecaster confidence levels, but admits actual decisions are based on estimated stratus burn-off time rather than on probabilities.
  - Both the STMC and the TMS appreciate when the forecaster deviates from the TAF for rapidly changing conditions. They want to know the minute the forecaster knows when there are changes (again, proactive on-site input), since the updates may allow more aircraft to get into the airport. In addition, they lauded forecaster accuracy with winter frontal passages and precipitation forecasts, since changing the airport landing configuration takes time. At the

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00371 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

- The STMC complimented the more inquisitive meteorologists, who actively seek to learn the airspace and communicate weather with reference to the airspace.
- The STMC has also noticed that the briefing quality is getting better. He especially remarked on incorporation of airspace graphics and on briefing pacing airports to give him a heads up on possible miles-in-trail issues.

- Additional Supervisor Traffic Management Coordinator
  - Feels the meteorologists understand controller needs and are interested and engaged.
  - Commented that quality has improved under current leadership, noting receptivity to "unusual" needs such as volcano status information and ash forecasts
  - Would prefer less focus on capacity issues to ensure forecast is not biased toward a particular arrival rate
  - Very customer-oriented unit

Northern California (NORCAL) Consolidated TRACON (NCT) Interview

- Acting Traffic Management Officer, NCT
  - Prefers proactive forecasts and notes some forecasters are more aggressive about providing updates than others.
  - Because there are so many microclimates and forecast nuances in the Bay Area, it is difficult to forecast for SFO and its approaches. There is a great need for accuracy and precision; missing the timing by 30-45 minutes is a blown forecast. Appreciates timely updates the unit provides and hopes the CWSU remains in place.
  - Lauded the wind shift forecasts, noting that landings can continue on a slight tailwind unless the runway is wet. These conditions can affect Oakland, San Francisco, and San Jose airports at the same time, requiring much airspace manipulation.

Note: There were no interviews with Air Traffic Control Tower personnel, since no towers had Traffic Management Officers.

Attachments:

1. Order ZOA 7210.6H, Operation of the Center Weather Service Unit
2. Example of forecast performance kept by CWSU MIC
3. AIRMET/SIGMET products for March 9-12, 2009
4. Site review checklists from NWSI 10-814

VerDate 11-MAY-2000 19:04 Jan 29, 2010 Jkt 050747 PO 00000 Frm 00372 Fmt 6601 Sfmt 6602 C:\DWORK\I&O09\071609\50747 SCIENCE1 PsN: SCIENCE1

CWSU Site Review
Ronkonkoma, NY (ZNY)
April 7-8, 2009

Attendees:
NWS: William Proenza, Director, Southern Region
Paul Witsaman, Regional Aviation Meteorologist, Southern Region
Thomas MacPhail, Aviation Services Branch, NWS Headquarters
I. Ross Dickman, Meteorologist in Charge, New York (Upton) WFO

FAA: Kevin Johnston, FAA Senior Meteorologist, ATO System Operations
Michael Golden, ZNY Traffic Management Officer
Ralph Tamburr, N90 TMO
Tom Kelly, ZNY STMC

This is the first Site Review for CWSU ZNY and will serve as a baseline.

Shifts: 6:30 AM – 2:30 PM; 2:00PM – 10:00 PM

Observations:
Observation of the CWSU meteorologists during the Site Review demonstrated a well-integrated unit that had earned the confidence of the ZNY TMU. Interviews with both the ZNY TMO indicated complete satisfaction with the products and services they receive. The staff was highly motivated and well-trained in aviation meteorology. They were appropriately knowledgeable of localized weather patterns and their impact on ZNY airspace and traffic routing. ZNY airspace is the most complex, congested airspace in the world. CWSU forecasters demonstrated a remarkable understanding of this airspace's interdependencies, complexities and associated weather impacts. This CWSU meets and exceeds the intent of National Weather Service Instruction (NWSI) 10-803.

Finding 1
This CWSU understands and anticipates their TMU's needs. They are well-integrated into TMU operations and were respected as integral members of the TMU staff. Those CWSU members observed were good communicators and did an excellent job adapting their briefings and products to customer requirements.

Recommendation 1a
The CWSU's integration into TMU operations would be significantly enhanced by collocating the CWSU within the TMU.

Recommendation 1b
CWSU MIC should continue working with the ZNY TMO on an action plan to move the CWSU to the TMO.

Finding 2
The CWSU staff produces a Severe Weather Avoidance Plan (SWAP) forecast product that was highly valued by the TMU staff. It was designed based on stated customer requirements and is an appropriate use of the MIS product to meet these unique requirements. No SWAP forecasts were required during the visit.

Recommendation 2a
Effectiveness of the SWAP forecast would be enhanced by evolving the product to a graphical/tactical decision aid (TDA) format. Examples of graphical convective forecasts were observed at ZTL and ZFW and should be used to guide ZNY's efforts.

Recommendation 2b
The CWSU MIC should begin activities to evolve the text-based SWAP forecast into a graphical TDA product similar to those being used at ZTL and ZFW.

Finding 3
CIWS workstation and training is not readily available to CWSU forecasters. CWSU meteorologists need to maintain situational awareness by continuously monitoring the zero to two-hour convective forecast generated by the CIWS workstation so they can then help the TMU better exploit this capability as a primary tool for managing traffic and severe weather avoidance within Center and TRACON airspace. A fully trained and continuously aware CWSU staff regarding CIWS would better anticipate and respond to TMU questions about CIWS forecasts.

Recommendation 3
CWSU MIC should work with the TMO to obtain CIWS training and full-time CIWS workstation access within the forecaster's workspace.

Finding 4
Slant range visibility, at times, has an unexpectedly large impact on hub arrival rates and, subsequently, on the TMU's ability to maintain traffic flow efficiency.

Recommendation 4
The NWS and FAA should investigate tools to help forecasters provide slant range visibility decision assistance

Finding 5
New York TRACON TMO stated a need for finer-resolution wind information for EWR/LGA/JFK than they can typically get from available TAFs. He also stated a need for better understanding, on a daily basis, of the expected variability of the wind speed and direction.

Recommendation 5a
CWSU should provide finer-scale surface and upper level wind information for JFK, LGA, EWR and PHL in their products and daily briefings. CWSU MIC should work closely with the ZNY and N90 TMOs to establish site-specific wind criteria for JFK, LGA, EWR and PHL. He should further adapt existing products and briefings to better communicate finer-scale wind information (beyond what is contained in TAFs) to include expectations of speed and direction variability. Briefings should further attempt to communicate the range of possible outcomes from most likely to worst case.

Recommendation 5b
ASB should work to make one-minute ASOS data available to WFO New York and ZNY CWSU forecasters.

ARTCC Interviews:

The CWSU Site Review Team interviewed two ZNY TMU representatives. The Traffic Management Officer, Michael Golden, and a Traffic Management Coordinator, Tom Kelly.

Traffic Management Officer

- Forecasters have good rapport with TMU supervisors and TMCs
- Agrees there is utility in having the CWSU closer to the TMU though feels their performance is not adversely impacted by their physical separation now due to their pro-active nature and continuous availability via mobile phone
- Enthusiastic about the SWAP forecast; provided guidance for its design and implementation

Traffic Management Coordinator

- Briefings are well-suited to our needs
- Forecasters fit in well with the team
- Briefings are routinely updated as required ahead of each national planning telcon.
- Forecasters always available via mobile phone when they are not physically present in the TMU or in their work area.
- CIWS information is invaluable; clearly better than any products available via WARP..CIWS can overlay fixes and routes
- "Very happy with them…they are interested and involved"

NY TRACON Interview

The CWSU Site Review Team interviewed Ralph Tamburr, TMO at the New York TRACON in person.

- Wind forecasts are not sufficiently accurate; generally over-forecast wind speed
- Generally wind forecasts are updated in reactive mode after-the-fact
- Wind criteria do not always meet our needs; particularly during times when wind is at or near a critical operational threshold; stated they could use higher-resolution information beyond what the TAF provides
- Forecasters are hampered by their lack of 1-minute ASOS data which is available to the TMU
- Wants to increase use of the Route Availability Planning Tool (RAPT); already use ITWS/CIWS extensively
- N90 finds CWSU SWAP product useful and effective
- Daily weather briefings need to contain more than just wind speed and direction forecasts like the TAF; need to convey more information about wind speed and direction variability and the most likely range of wind outcomes
- CWSU sometimes initiates update briefings but not as consistently as needed

CWSU Site Review
Salt Lake City, UT (ZLC)
April 29-30 2009

Attendees:

NWS: Lynn Maximuk, Director, Central Region
Paul Witsaman, Regional Aviation Meteorologist, Southern Region
Dorothy Haldeman, Aviation Services Branch, NWS Headquarters
Larry Dunn, Meteorologist in Charge, Salt Lake City WFO

FAA: Kevin Johnston, FAA Senior Meteorologist, ATO System Operations

This is the first Site Review for CWSU ZLC and will serve as a baseline.

Shifts: 6:30 AM – 2:30 PM; 1:30PM – 9:30 PM

Observations:

The Salt Lake City CWSU meteorologists are a well trained, aviation-focused crew with innovative leadership. The unit is extraordinarily well integrated into the ARTCC and they are a highly valued, highly praised member of the ARTCC team. Their attention to the impact their forecasts have on operations was highly praised.

Three Stand-up briefings were observed. They form a part of the complete ARTCC briefings which are held in the CWSU. This participation is cited as part of the reason why the CWSU meteorologists are so well integrated into ARTCC operations.

- Finding 1

  The Review Team heard repeatedly about the outstanding job the CWSU did the day before the Site Review. Just prior to the morning push, the CWSU was proactive in forecasting a 20 kt wind shift. Because of the trust developed with traffic managers, the active runway was switched in time to avert having to change runways during the traffic push. "They know the pushes."

- Finding 2

  The CWSU is innovative and has developed unique, automated products specific to their ARTCC (Best Practice). The following TDAs were developed with input from ZSE and ZFW.
  - TAF TDA (Figure 1)
    - Color coded TAF highlighting ceilings, visibilities, and wind shifts. The CWSU runs 18 TAF TDAs in their area of responsibility.
  - Convective TDA (Figure 2)
    - Skill marginal but TDA increases the meteorologists' awareness of weather impacts to the TRACON and posts while increasing the interaction and communication with controllers.
  - Compression TDA (Figure 3)
    - Vertical wind profile with freezing level.

- Autorun off the RUC.
- Customized for TRACON airspace – could be expanded to other sites.
- Controllers are used to seeing numbers vs. wind barbs.
  - Different formats are being evaluated in order to eliminate need for controllers to interpolate. Possibilities: color-coding or text format.
- FAA COTR would like to see this product produced for all 35 OEP airports.

Recommendation 2
MIC should continue development of Compression TDA.

- Finding 3
  CWSU transmits approximately 7000 PIREPs/ year. The TMU enters them internally for ZLC airspace. Workload is generally not a problem but occasionally the meteorologists rely on Flight Data to help.

- Finding 4
  Enhanced ARD: CWSU MIC states the IT support form the WFO is "outstanding" and has led to improved systems and collaboration
  - WFO SLC ETs worked very hard to improve the D2D with installation of the 'Local Mount'. Once the data is pulled from the WFO it is stored locally allowing much faster refresh rates, swaps and animation. AWIPS is the CWSU's key system for analyzing weather and its "painfully" slow speed limits CWSU capabilities.
  - ETs continue work on AvnFPS.

- Finding 5
  Web cams are installed at key airports throughout the ARTCC area of responsibility and are relied on extensively.

- Finding 6
  CWSU has access to the TSD, but it is currently unused.

Recommendation 6
MIC should investigate obtaining TSD access.

- Finding 7
  5-minute ASOS observations are available at the WFO via dial-up and can be accessed at the CWSU and 1-minute observations are available on WARP. However, having 1-minute observations available on AWIPS would be helpful.

Recommendation 7
ASB should work with OS7 to obtain 1-minute observations for ingest into AWIPS.

- Finding 8

  Per request, graphics of AIRMETs/SIGMETs for winds, and four other products: icing high and low level turbulence and winds aloft are developed in a standard format controllers are used to seeing. These products copied and hand delivered to each ARTCC area and supervisor. They could be placed in sequence on the WARP Briefing Terminals but controllers prefer viewing only the RADAR on Briefing Terminals and are impatient waiting for the sequencing to process. Although the idea of sequencing has been raised and rejected, the use of WARP is still something to consider. While the CWSU is responsive to the request, there is a potential to strain the workload on busy weather days. There may be other, easier ways to get information to controllers and make use of equipment already in place. WARP Program Office has put no money into weather development for some time and consequently WARP functionality is unchanged. Entering products into SAIDS is another possible solution.

  The benefit of hand delivering products to the ARTCC floor is the opportunity provided for interaction with controllers and supervisors.

  Several products are also placed on the ZLC web page which traffic supervisors can access. This information cannot be viewed by controllers since FAA does not allow them to have access to computers with internet capability. Possible solutions are FAA's Intranet and the WARP Briefing Terminals. SAIDS can also be used to get information to the Tower and TRACON

  Recommendation 8a

  ASB should work with the FAA COTR to investigate a means of delivering CWSU products electronically to controllers and supervisors.

  Recommendation 8b

  MIC should follow up on assuring a means of communicating products to all controllers in the ARTCC, Towers and TRACON

- Finding 9

Training, cross-training and outreach are given high priority at both the CWSU and the WFO.

- MIC and another meteorologist perform preponderance of FAA Safety Team Briefings – 20 this year and still expanding. They also attend the Annual Montana Aviation Conference
- The CWSU meteorologists visit and shadow the Tower, TRACON, and WFO and form part of their annual proficiency checks. Visits are also made to other forecast offices, towers, and the Air National Guard within ZLC's area of responsibility.
- MIC cited the value of meetings with other CWSU MICs and stated he has picked up and exchanged valuable information this way. He specifically mentioned the usefulness of break-out sessions at the WR MIC Conferences and said ideas for several of his TDAs came from the ZSE MIC

- The WFO and CWSU MICs have developed a strong cross-training program which should be considered a Best Practice. Three meteorologists from the WFO are approved to work at the CWSU including the Aviation Focal Point and two CWSU meteorologists have been trained on the WFO Aviation Desk. In addition, all WFO meteorologists have visited the ARTCC. Meteorologists from both offices collaborate on joint outreach projects. OEP discussions with WFO in AWIPS and in chat with Aviation Desk focus on weather impacting arrival rates.

- Finding 10

  Annual proficiency checks of the CWSU meteorologists are performed, but lack a quantitative element. It was suggested that any metrics should be oriented toward forecast impacts and that the operational impact log could be evaluated and compared to weather to see where metrics could be developed given impacts. FAA COTR suggested wind should be a part of any CWSU metric since it has the biggest impact at this ARTCC.

  Recommendation 10

  MIC should work with WFO MIC to develop proficiency metrics and evaluate the possibility of incorporating forecast impacts perhaps using winds.

- Finding 11

  While interviewing a TRACON Supervisor he thought of asking the CWSU MIC for daily briefings. "I know he will say yes." Shortly after the interview concluded they had met and agreed on telephone briefings at 7am and 2pm.

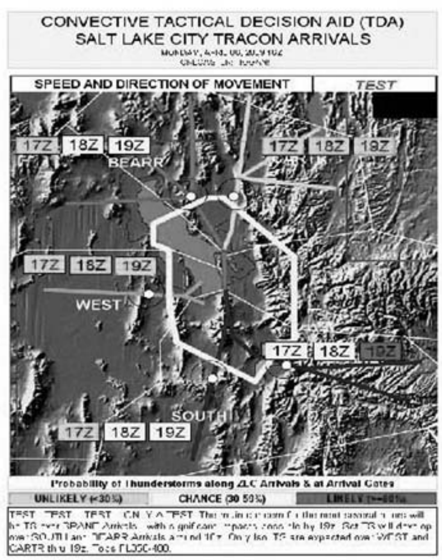
The following are excerpts from interviews with the ARTCC Traffic Management Officer (acting, but also TMO at another ARTCC) the Operations Manager in Charge (OMIC), Area Supervisors, and Controllers:

- They focus on operational impacts
- High performance unit – focus is on impacts
- Nothing but accolades for CWSU/NWS
- New people adapt fairly quickly – latest new person was especially quick to fit in.
- Consistent quality regardless of who is on duty
- They're good but yes, could be more accurate
- Not as proactive at the TRACON as at the ARTCC; they have a good relationship with the Tower and the Center – we call, they call. We try to anticipate changes and we're pretty good, but they call and tell us what's up – awesome.
- They have become more in tune to needs by way of having stand-up in the CWSU area. They know what's going on with everything and know what is needed in case of an accident or an outage.
- Trend in MICs over time – things have gotten better, e.g., web site – development of new programs and implementation of them. More aviation focused now.
- "They're pretty dog-gone accurate"
- Had a situation with a GA pilot caught in mixed icing and called for a meteorologist. He was there with information within one minute. Pilot was saved – twice (since he got back into the icing after waiting only a short time on the ground).
- Might not be value added to have web site up.
- We would hate to see them gone from the facility – there are too many days when we'd miss them.
- We rely on them so heavily. There is no other source. They are here first with changing information
- They make us look smarter and make us safer – we're able to stay out in front
- Anytime something additional is requested, don't have to ask twice. They're very good.
- They're on top of their game.
- They show up early on their own and no one has ever left when there are thunderstorms.
- They always leave a morning look-ahead before departing at night.
- The ability of the CWSU meteorologists to impart their knowledge to new controllers coming in is invaluable.
- There is a serious and repeated concern that losing the CWSU means losing local weather expertise and a meteorologist in Kansas City will be unable to help in the way Controllers and Traffic Managers have come to rely on. The Meteorologists help is "invaluable" when a pilot is in trouble – and then they are at the controller's side with the needed information inside of a minute.

Figure 1. TAF TDA

Thu, 23 Apr 2009 1:49 PM MDT

Figure 2. Convective TDA



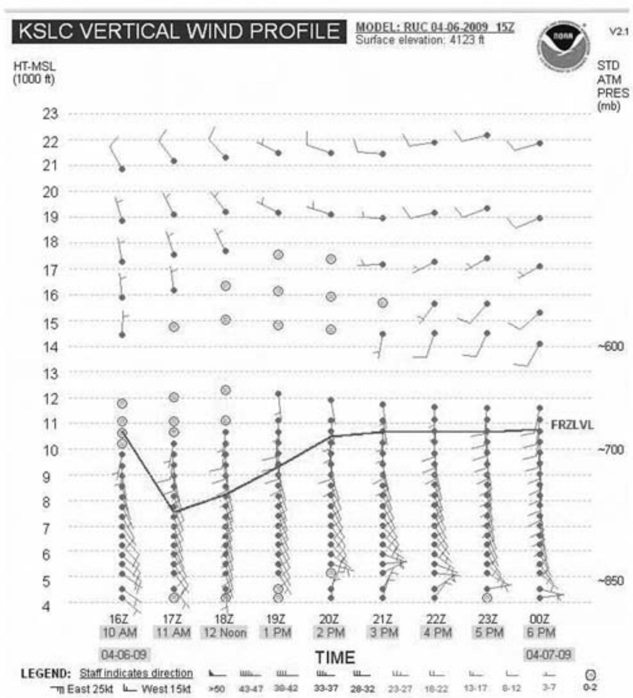


Figure 3. Compression TDA

CWSU Site Review
Seattle, WA (ZSE)
May 19-20 2009

Attendees:
NWS: William Proenza, Director, Southern Region
Paul Witsaman, Regional Aviation Meteorologist, Southern Region
Dorothy Haldeman, Aviation Services Branch, NWS Headquarters
Bradley Coleman, Meteorologist in Charge, Seattle WFO

FAA: Kevin Johnston, FAA Senior Meteorologist, ATO System Operations

This is the first Site Review for CWSU ZSE and will serve as a baseline.

Shifts: 5:00 AM – 1:00 PM; 1:00PM – 9:00 PM

Observations:
The Seattle CWSU is located behind the Operations Manager and next to the TMU. They are well integrated into Center operations and are praised by FAA for being innovative and responsive to their needs. The Seattle ARTCC area of responsibility includes TRACONs at Portland, Oregon and Spokane, Washington as well as Seattle. The MIC developed webpages for ZSE and PDX to enhance situational awareness and include TDAs for winds, TAFs, and convection.

The TMO is briefed each morning when he arrives before the stand-up around 6:15 am. The briefing is informal and not logged. The formal morning stand-up briefing takes place at 8:00am and in the afternoon at 4:00pm during the week and at 4:30pm on weekends. Several Traffic Managers commented that they like the ability to walk over to the CWSU to ask questions and discuss weather affecting their work.

Finding 1

The stand-up briefings are limited to 3-minutes. Content and presentation have been standardized to aid understanding. (Best Practice)

Finding 2 – TDAs

- Compression Wind and Convective TDAs were developed by the ZSE MIC as the result of discussions with Seattle TRACON.
- They are prepared for all regional airports in the ZSE area of responsibility. Supervisors can see them at their desks. They also run as tickler headlines on the ZSE web site (e.g., CNN)
- Convective TDA is updated every 3 hours or hourly when convection is present.
- Compression TDA includes LLWS and FZL, is color coded {blue/red}, and includes a training button.
- ZSE MIC developed and supplies TDAs for all 35 OEP airports as requested by ASB and others. This is a temporary fix while AWC completes a task to develop TDAs for all regional airports and places them on the national CWSU web site.

- The ZSE work on TDAs is considered a Best Practice.

Finding 3

Fog, low clouds, icing produce the most frequent weather at ZSE. There is no convection to speak of, and the CWSU does not participate on CCFP calls unless convection is a possibility in the ZSE area of responsibility

Finding 4

The Puget Sound Convergence Zone has an enormous impact on aviation operations and on arrival rates at Seattle and Boeing Field where arrivals and departures can interfere with each other. Consequently this can create a huge impact on controller workload and much emphasis is placed on correctly forecasting convergence. FAA acknowledged it is a "tricky" forecast and noted that "old folks were good at it – but have left. There's a learning curve for people coming in." Consequently the Seattle Convergence Zone is a subject of focus for new hires.

Finding 5

There is an evening push of cargo flights from around 5pm to about 8pm at both SEA and PDX. Cargo flights include a lot of smaller aircraft which are more susceptible to icing. Icing is the big killer in the northwest and the CWSU meteorologists "do a very good job with that" per FAA.

Finding 6

Web-page development has been the biggest focus at ZSE recently. It's about situational awareness for remote customers – 1-stop shopping and customized products/services are offered. FX-net and FSC were used to produce the webpage. (FX-net hooks into the Western Region FX-net server.) TRACONs can view the web page and separate products are produced for the Portland and Seattle TRACONs. There is also a big GA interest in the web site based on the number of hits counted, plus feed back at conferences. Several interviewees mentioned how much they value the web page saying they keep it up at their desks.

Finding 7

Website is available overnight. In addition, meteorologists provide a hard copy forecast before leaving for the night. Several interviewees mentioned how valuable the web site and hard copy forecast are. (Best Practice)

Finding 8 – PIREPs

- ERAM will be installed at ZSE in July/August and will change the way PIREPs are disseminated. ZSE goes beyond the basic requirement of disseminating only significant weather PIREPs. All routine PIREPs go out on Service A and B. This was initiated years ago and has become 'expected'. Handling PIREPs was not included in ERAM planning and a work-around will have to be developed. CWAs will be placed on the ASRS. One interviewee recommended the closest person to the AISR should input the PIREPs – e.g., the Operations Manager or Area Supervisor.

- Several of those interviewed mentioned how helpful the briefings/forecasts are for knowing where to solicit PIREPS.
- Currently, the Weather Coordinator in the TMU enters all PIREPs – it's a staffed position on a high-PIREP day.
- A recent draft order now circulating saying ERIDS can be used to disseminate weather information, changing a previous order which stated no real-time data could be entered.

Recommendation 8

MIC should follow closely the development of a work-around for ERAM and share any pertinent information with other CWSUs as this is an issue throughout the system.

Finding 9

There is a lack of training accompanying new FAA equipment. CWSU meteorologists feel they are lucky to have access to new equipment such as ETMS, ACE/IDS, and AISR, but although training has been requested, none is provided. No training has been provided for WARP since it was installed.

Recommendation 9

ASB will work with FAA to see that timely training is made available for meteorologists when new equipment and/or software or new procedures are added.

Finding 10

The CWSU makes extensive use of e-training and multiple courses, including COMET, are integrated into the meteorologists GWPAS's. Training plans and task book are modeled on those at ZFW.

Finding 11

CWSU meteorologists have provided training for FAA personnel in the past, and could do more in the future. Several interviewees mentioned they would like to see more training. One said "Face- to-face training is always better than CBI" and another mentioned a seasonal briefing of what to expect would be nice to have.

Recommendation 11

MIC should follow up and discuss the possibility of re-establishing face-to-face training with FAA.

Finding 12

ZSE MIC plans to issue a newsletter for his FAA facilities in an effort to provide refresher training. It is being modeled on the Albuquerque Newsletter. MIC will follow up once the CWSU is fully staffed.

Recommendation 12

MIC should continue plans to develop a newsletter.

Finding 13

Due to the way computers and office space are configured, training as well as any development work must be done in the operations area. CWSU is allowed no VPN Internet access although there are contractors that do have access. FAA LAN is accessible only the administrative area.

Finding 14

NWS Chat is used to develop the OEP product and provide guidance to PDX & SEA WFOs. It's informal and more attention is paid when weather is critical. Morning calls were tried and they are still searching for the optimal use of 1-2 Planet and Chat.

Recommendation 14

The ZSE MIC is encouraged to keep working with the WFO to find an optimal mix of communications tools and coordination times.

Finding 15

One Ops Mgr mentioned that ZOA separates hazards into those that are happening now and those that are forecasted. He stated he had not talked to the ZSE MIC about it, but it may be something others are interested in.

Recommendation 15

MIC should check to see if this approach would be appropriate for ZSE.

Finding 16

Since CWSU MICs are not on the Western Region MIC list, some information important to CWSUs can go missing. This is being worked with the WFO MIC and with Western Region.

The following are excerpts from interviews with the TMO, Supervisors and Controllers:

- Good relationship – proactive. The service is valuable and should be retained and retained here – would absolutely retain if my pot of money and would put CWSU in the TMU and give you the weather coordinator position.
- They work hard at being innovative.
- They work minute by minute with traffic management – another advantage to having them here – can plan and manage better.
- Get pretty good service from CWSU – they're good communicators – they push information when it's needed. The fog forecast now is not as good as it used to be.
- Would like to be able to get a group together to voice opinions and build consensus when new products are developed.
- They're well aware of impacts – they know what we need and situational awareness is good.
- One of the meteorologists was shy – it's been corrected. If they miss a lot – they get feedback. They always come over and let us know when something is coming.
- They are a valued resource – we would like to keep them. They not 100% - no one is. When there is icing, glad to know I can walk over and ask them questions.
- "We rely on the CWSU and its regional and local expertise."
- All the supervisors have the website, wind profiles at their work sites.
- Special briefings are called if warranted.
- CWSU tries to be innovative and they are proactive.
- CWSU provides an excellent one-page briefing sheet before they leave for the evening
- The website is impressive and will be used more and more.
- "I'd hate to have that human element gone."
- They are top notch, timely, so a great job and provide good content.
- Communications and dissemination are excellent
- Likes routine opportunity to offer suggestions on CWSU products and services
- Horrible idea to pull them out. They help avoid accidents. I love them.
- They are effective and timely. They have been very accurate and have great situational awareness. They provide a briefing before leaving and it's most appreciated.
- Tremendous service for air traffic as well as planning.
- Good use of FAA resources.
- Talks to TMCs all day.
- Face-to-face briefings are preferred to briefing by telephone.
- Over the years they have developed the optimum level of products, services, etc.
- They would like face-to-face training – especially seasonal.
- The TMU depends on the CWSU
- The Sand Point NWS office and the CWSU complement each other.
- The NWS is absolutely invaluable to FAA daily operations.
- He briefs himself and then calls the as necessary. He appreciates the heads-up from the WFO particularly on changing weather, finer tuning of events, wind shifts, and convergence, etc.
- Convergence is a major (weather focusing phenomena in Seattle) and the most locally experienced forecasters are more accurate.
- They are a valued resource, we enjoy working with them.

- When we're dealing with icing they are very much needed – we can walk over and ask questions.

CWSU Site Review
Memphis, TN (ZME)
June 9-10, 2009

Attendees:
NWS: Robert Tibi, Director, Western Region
Scott Birch, Regional Aviation Meteorologist, Western Region
Beth McNulty, Aviation Services Branch, NWS Headquarters

FAA: Kevin Johnston, FAA Senior Meteorologist, System Operations

This is the first Site Review for CWSU ZME and will serve as a baseline for all CWSUs.

Shifts: 5:30 AM – 1:30 PM; 1:30 PM – 9:30 PM

Observations:
Observations of the CWSU meteorologists during the Site Review and interviews with ARTCC personnel demonstrated an integrated, proactive weather unit that had the complete confidence of the ARTCC. The ZME CWSU site review revealed an office with quality leadership. This CWSU meets the intent of National Weather Service Instruction (NWSI) 10-803.

Finding 1:

- The CWSU is located adjacent to the TMU making interaction and team work easy. The TMU treats the CWSU staff as one of their own.

Finding 2:

- A new forecast product of wind speed and direction for the over night (mid) shift have shown positive improvements to traffic management operations by allowing more cargo aircraft to land at night (increase of ~115%). The CWSU is verifying the operational impacts of their nightly wind forecasts for potential performance measure.

Finding 3:

- ZME ARTCC manages the world's largest air cargo operation late at night. The cargo aircraft "push" is from 10 pm to 1 am. Some enroute ARTCC personnel discussed a desire for nighttime CWSU services, and almost all the ARTCC personnel interviewed did not know who to call for CWSU ZME weather backup.

Recommendation 3a

- CWSU and TMU should work together to clarify the procedures for requesting CWSU support after normal operating hours.

Recommendation 3b

- CWSU and WFO should train the TMU and watch desk on CWSU backup offices especially during the over night hours.

Finding 4:

- PIREP dissemination is accomplished through multiple systems and by multiple individuals in the ARTCC. First of all, the PIREP is transmitted from the pilot to the controller, and transferred from controller to the area supervisor. Next, the area supervisor provides the PIREP to the CWSU (via paper copy) to be entered into the AISR and host systems. Lastly, the CWSU enters the PIREP into the shift log for record keeping. The cumbersome nature of PIREP dissemination could potentially delay PIREP transmission especially during busy weather periods.

Recommendation 4

- ASB should work with FAA to investigate PIREP dissemination to alleviate multiple entry points and systems.

Finding 5:

– The CWSU is responsible for the Weather Coordinator tasks when on duty.

Recommendation 5

- The NWS should work with the FAA to clarify the weather coordinator function.

Finding 6:

– GR2 Analyst NEXRAD viewer software is used by the CWSU and TMU to interrogate storm structure and is considered a best practice.

Recommendation 6

- The NWS should consider purchasing GR2 Analyst NEXRAD viewer software for all CWSUs.

Finding 7:

- Some ARTCC personnel interviewed stated on occasion standup weather briefings are too lengthy and not focused on the problem of the day.

Recommendation 7

- The CWSU MIC should provide briefing training and a standard briefing template to focus the staff on the problem of the day.

Finding 8:

- The CWSU has access to the FAA's web based Tactical Situation Display (TSD) for tracking aircraft operations. The web based TSD's functionality is not sophisticated enough for CWSU operations.

Recommendation 8

- The NWS should consider purchasing Flight Explorer for all the CWSUs that do not have full access to FAA's TSD (more functionality than the web version).

Finding 9:

- The NWS CWSU Short Term Improvement Plan provided Camtasia for the CWSU which the MIC has been examining for future projects. The enhanced AWIPs Remote Display has also been a benefit to the CWSU. No other Improvement Plan items were being used by the unit.

ARTCC Interviews:

The CWSU Site Review Team interviewed nine ARTCC representatives, the majority from the enroute section of the facility (air traffic controllers). The ARTCC management were not freely available for interviews. Only one manager was interviewed after an individual request by the team, and only one ARTCC person attended the out briefing.

The ARTCC representatives provided valuable insight into the working relationship between the CWSU and the Center. Each person interviewed praised the products and services from the CWSU. In addition to the Findings and Recommendations, the following are further remarks and observations from the interviews:

<u>Air Traffic Control</u>

- CWSU services are "absolutely essential".
  - "real answers to real questions"
- During the mid night shift, the personnel obtain weather information from private vendors, PIREPs, TSD, ATCSCC, WFO or just "guess" what weather will be.

<u>Traffic Management Unit and Traffic Management Officer</u>

- TMU has "a lot of confidence in the CCFP".
- TMU and CWSU frequently discuss possible new products and services.
- Inconsistent weather "is not necessarily a bad thing".

Memphis TRACON and Tower Interview

- The Memphis TRACON and Tower are managed by the traffic management unit in the ARTCC. Since the management is remote to the facilities, the CWSU Site Review Team only interviewed one person. The team interviewed the Memphis TRACON remotely (telephone). They are pleased with the CWSU's web page and use it frequently. Furthermore, the nightly phone briefing for mid shift operations is useful to their operations. The TRACON normally initiates on demand requests from the CWSU (they call CWSU).

The following are additional observations from the review:

- The CWSU forecaster was very busy because the convective weather was active on June 10th. Tornado watches and warnings were issued for the northern and western edge of the ARTCC area (parts of Missouri and Arkansas).
- CWSU uses WARP exclusively to produce graphical products for TMU briefs.
- AVNFPS is not used by the CWSU for TAF and METAR monitoring. The CWSU uses a "plotter program" that has the same capability as AVNFPS for the CWSU.