

NATIONAL WEATHER SERVICE INSTRUCTION 10-1301

October 21, 2014

Operations and Services

Surface Observing Program (Land), NWSPD 10-13

AVIATION AND SYNOPTIC OBSERVATIONS

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

OPR: W/OS7 (J. Heil)

Certified by: W/OS7 (K. Schrab)

Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive procedure replaces NWSI 10-1301 “Aviation and Synoptic Observations” dated February 9, 2010. All references to FAA sponsored aviation observations, including sites visits, exams, etc. were eliminated from document. Eliminated appendix A – Supplementary Aviation Weather Reporting Station Program. Changed title of Appendix B to Aviation Observing Program at NWS Sites, and renamed it Appendix A. Changed title of appendix C to Inspection Procedure Guidelines at NWS Sponsored Aviation and Synoptic Observation Sites, and renamed it Appendix B. Appendix D was renamed Appendix C. Added Appendix D – Certification of NWS Observers, which replaces directive procedure NWSI 10-1304 “Certification of Observers” dated July 2, 2010. This revision consolidates the directives and sections of directives that were specific to the NWS aviation and synoptic observation programs. Changes were made to eliminate duplication of information. Word changes were made to improve readability, to clarify the information, and to reflect current practices. Forms were updated to reflect current practices. These forms will replace existing ones and will only be available electronically.

Signed

October 7, 2014

Andrew D. Stern
Acting Director, Office of Climate,
Water and Weather Services

Date

Aviation and Synoptic Observing - Land

<u>Table of Contents:</u>	<u>Page</u>
1 General.....	2
2 Aviation Observing Programs.....	2
2.1 Automated Surface Observing Systems (ASOS).....	2
2.2 FAA-Sponsored Sites.....	2
2.3 Aviation Paid (A-Paid) and Aviation Voluntary (A-Voluntary) Observing Program	2
3 Synoptic Observation Program	2
4 Compensation	3
5 Responsibilities	3
5.1 National Weather Service Headquarters (NWSH).....	3
5.2 National Weather Service Regional Headquarters (RH)	4
5.3 National Weather Service Field Offices	5
6 Procedure for Establishing NWS Sponsored Observation Sites.....	6
6.1 Determination of Station Elevation (H_p).....	6
6.2 Preparation of Pressure-Reduction Tables.....	6
7 Historical File of Aviation and Synoptic Observation Forms.....	6
8 Procedure for Discontinuing Observation Programs Due to Station Closures	6
 APPENDIX A - Aviation Observing Program at National Weather Service Sites.	 A-1
APPENDIX B - Inspection Procedure Guideline at NWS Sponsored Aviation and Synoptic Observation Sites	B-1
APPENDIX C - Instrument Requirements and Standards for the NWS Aviation and Synoptic Observing Programs (Land).....	C-1
APPENDIX D - Certification of NWS Observers.....	D-1

1 General

This instruction and attached appendices describe the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) methods and procedures for oversight of our aviation and synoptic observing programs at land stations. As used in this instruction, "observation program" refers to all station activities, equipment, schedules, and procedures related to making, recording, or disseminating the aviation and/or synoptic observations for which the station is responsible.

2 Aviation Observing Programs

NWS provides aviation observations in support of national requirements, and international commitments at Pacific and Alaska Regions only. The NWS provides quality observations through automated means whenever possible at designated locations. The NWS provides quality control of the Federal Aviation Administration (FAA)-sponsored sites. At other locations, aviation observations are provided through manual methods. NWS and FAA staff, federal or contract, responsible for aviation weather observations should provide those observations as described in FAA Order 7900.5, "Surface Weather Observing," which can be found at: http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1020629.

2.1 Automated Surface Observing Systems (ASOS)

An unattended ASOS meets all requirements to support the forecast and warning programs of the NWS. In the Alaska and Pacific Regions, NWS staff will augment and backup ASOS in accordance with the Aviation Service Levels assigned to their station. A link to the current list of assigned Aviation Service Standard Levels can be found under "Links" at: <http://www.weather.gov/om/forms/>.

2.2 FAA-Sponsored Sites

The NWS will provide quality control for FAA-sponsored observing sites in accordance with Appendix B.

2.3 Aviation Paid (A-Paid) and Aviation Voluntary (A-Voluntary) Observing Program

The NWS regions can fund and establish A-Paid and A-Voluntary observing stations in order to carry out their aviation forecast responsibilities. These stations and their equipment are sited and configured in accordance with Appendix C, "Instrument Requirements and Standards for the NWS Aviation and Synoptic Observing Programs (Land)."

3 Synoptic Observation Program

NWS provides synoptic observations in support of national requirements and international commitments. NWS will provide observations through automated means at designated ASOS sites. At other locations synoptic observations will be provided by manual methods. NWS staff responsible for synoptic weather observations will produce the observations as described in Federal Meteorological Handbook No. 2 (FMH-2), "Surface Synoptic Codes," which can be found at: <http://www.ofcm.gov/fmh2/fmh2.htm>. NWS regions can fund and establish Synoptic Paid (S-Paid) observing stations in order to carry out their forecast responsibilities.

4 Compensation

Paid observers are usually paid on a per observation basis. The payment rates will be determined by the Regional Headquarters (RH).

5 Responsibilities

5.1 National Weather Service Headquarters (NWSH)

National coordination for development, drafting and issuance of policy and guidance for provision of aviation and synoptic observations is shared by four offices. These offices are the Office of Climate, Water and Weather Services (OCWWS), Office of Operational Systems (OOS), Office of Science and Technology (OST), and the Office of the Chief Information Officer (OCIO). Their responsibilities are described below.

OCWWS provides guidance and direction for the execution of the surface observation program. To carry out this responsibility OCWWS:

- a. Establishes requirements for aviation and synoptic observing programs.
- b. Coordinates and negotiates with other government agencies on national and international matters pertaining to aviation and synoptic observing policies, procedures, and requirements, especially as related to sites with human observers. This includes certification of observers, inspection of observing sites, and quality control of observations.
- c. Sets standards for accuracy and siting of weather instruments based on Office of Federal Coordinator for Meteorology (OFCM) documents.
- d. Prepares and makes available documentation and forms for use in aviation and synoptic observing programs.

OOS provides guidance and direction for operation and maintenance of the systems that provide surface observations. To carry out this responsibility OOS:

- a. Develops policy and procedures for operation and maintenance of surface observing systems.
- b. Manages national operational surface observing systems. This includes, but is not limited to, developing implementation plans for surface observing systems and managing execution of the plans; conducting routine and ad hoc meetings and leading and coordinating inter agency efforts to identify and resolve operational issues; managing the Operations & Maintenance (O&M) budget for surface observing systems, and; providing help desk operational support from the Sterling Field Support Center.
- c. Tests and evaluates new systems and integration of subsystems prior to implementation, provides guidance for software development to support new systems, and tests new software loads prior to implementation.
- d. Provides direction and guidance to field maintenance personnel, conducts engineering studies of system performance and initiates corrective actions as necessary, requisitions shipment of systems and subcomponents to field sites and controls logistic supply.

- e. Provides observing system logistics, reconditioning, and calibration support from central facility, the National Logistic Support Center (NLSC), Kansas City, Missouri.

OST provides project management for developing, acquiring, and initially deploying new technology and systems. To carry out this responsibility OST:

- a. Manages execution of project management and development programs. Assesses science and technology options, prepares solutions and develops plans to meet service requirements. Plans, coordinates, and manages technical infusion and evolution program.
- b. Leads and manages systems engineering, development, integration, testing of and initial deployment of observing systems. Approves all systems engineering changes; reviews system performance; identifies needs for system changes. Manages risk reduction activities.

OCIO, Telecommunication Operations Center, Telecommunications Gateway, ASOS Operations and Monitoring Center (AOMC) provides a vital service for the Automated Surface Observing System (ASOS) program through its maintenance monitoring support for all fielded ASOS sites and remote access to ASOS site-specific parameter and configuration files, and a precision time-source via a toll-free number.

- a. The AOMC support of ASOS includes remote diagnosis of maintenance alerts reported by ASOS when a problem or issue is encountered. At completion of its diagnosis, the AOMC will notify the designated maintenance focal point of the problem for resolution by an NWS technician. Additionally, the AOMC tracks and reports on ASOS data availability through the tracking of ASOS METAR observations.
- b. The AOMC also maintains the master database of ASOS site configuration information. The database consists of ten files for each site with more than 3500 specific items which define everything about the site from sensor configuration to the digitized voice identification of its airport name. These files are transferred to and from the AOMC automatically as changes occur at each individual site. In addition, the AOMC provides access to a precision time source linked to the National Institute of Standards and Technology (NIST) in Boulder, CO, which helps keep all ASOS system clocks synchronized.

5.2 National Weather Service Regional Headquarters (NWSRH)

NWSRH's are responsible for field office compliance with directives established by OCWWS. NWSRH coordinates with other government agencies at the regional level. Regions will:

- a. Ensure field offices implement aviation and synoptic observing programs in compliance with national directives.
- b. Review and approve or disapprove requests of field offices to establish or close the following types of observing stations (see Sections 6-8): A-Paid, A-Voluntary, and S-Paid.

- c. Document agreements, and any fees, for observing services between the NWS and the observer. Use NOAA Form 36-14 for the A-Paid and S-Paid programs.
(<http://www.nws.noaa.gov/om/forms/>)
- d. Provide Contract Officer's Technical Representative(s) for contract observing sites.
- e. Perform station visitations/inspections at NWS field offices. Alaska and Pacific Regions also perform non-NWS observation site inspections (not to include FAA Sites).
- f. Notify OCWWS of suspension of any observing program.

5.3 National Weather Service Field Offices

The data provided by the aviation and synoptic observing programs is vital to the completion of the NWS mission. The Meteorologist-in-Charge (MIC) ensures personnel and resources are directed to:

- a. Provide and disseminate observations.
- b. Manage/supervise observing programs.
- c. Perform quality control of observations.
- d. Perform and report on station visitations/inspections.
- e. Maintain an updated technical library either hard copy or easy access to the links identified below. The library will consist at a minimum of the following:
 - (1) Office of Federal Coordinator for Meteorology
 - (a) Federal Meteorological Handbook (FMH) #1, Surface Weather Observations and Reports (<http://www.ofcm.gov/fmh-1/fmh1.htm>)
 - (b) FMH #2, Surface Synoptic Codes (<http://www.ofcm.gov/fmh2/fmh2.htm>)
 - (c) Federal Standard for Siting Meteorological Sensors at Airports (<http://www.ofcm.gov/siting/text/a-cover.htm>)
 - (2) Observing Handbooks and Related Documents:
 - (a) FAA Order 7900.5 Surface Weather Observing (http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1020629)
 - (b) FAA Order 7210.3, Facility Operation and Administration, especially Chapter 2, sections 9 and 10 (<http://www.faa.gov/documentlibrary/media/order/7210.3v.pdf>).
 - (c) FAA AC 91-14D, Altimeter Setting Sources (http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23147)
 - (3) ASOS Documentation (<http://www.nws.noaa.gov/asos/>) :
 - (a) ASOS Software Users Manual
 - (b) ASOS User's Guide
 - (c) ASOS Ready Reference Guide
 - (4) Training Documentation:
 - (a) Training Guide in Surface Weather Observations (<http://www.weather.gov/om/forms/resources/SFCTraining.pdf>)

- (b) International Cloud Atlas (abridged Atlas) or cloud chart

6 Procedure for Establishing NWS-Sponsored Observation Sites

New sites can be established at locations from which meteorological data are required if:

- a. Funds, both one-time and recurring, are available, and
- b. The MIC or his/her representative has determined the location satisfies all applicable siting criteria defined in FMH #1, Federal Standard for Siting Meteorological Sensors at Airports, and Appendix C of this NWSI. Ensure the site location allows the observer to evaluate all elements within the period of the observation.

6.1 Determination of Station Elevation (H_p)

- a. At new airport stations, H_p will be equal to the Field Elevation (H_a) rounded to the nearest foot.
- b. At non-airport stations, H_p should be equal to the height of the barometer (H_z) rounded to the nearest foot.
- c. If there is reason to issue new elevation data for an existing station, H_p will be revised in accordance with either a. or b. above if the difference between the old and revised H_p exceeds 50 feet.

6.2. Preparation of Pressure Reduction Tables

NWSH will prepare these tables for individual stations upon request. To obtain these tables, provide the following information to OOS, Field Systems Operations Center, Observing Systems Branch (OPS22):

- a. Station name and type.
- b. Field elevation (H_a), station elevation (H_p), and height of barometer (H_z), all to the nearest foot.
- c. Latitude and longitude (in degrees and minutes).
- d. Average annual temperature for the station.

7 Historical File of Aviation and Synoptic Observation Forms

Retain corrected copies of the aviation and synoptic observation forms on station for 90 days. After 90 days the copies can be offered to a local public library, public institution, or university, etc., capable of archiving the data for public use. If no local user can be found, the forms should be destroyed after the retention requirement has been satisfied. The National Climatic Data Center (NCDC) is considered the official source of observation data.

8 Procedure for Discontinuing Observation Programs Due to Station Closures

Adhere to the following procedures when a decision is made to close a station:

- a. NWS will not maintain observations at closed stations.
- b. NWS can agree to requests by others wishing to continue the observation program. In such a case, the requesting party is required to agree to assume responsibility for funding all costs of the program above and beyond costs incurred by NWS to provide normal support functions.

- c. If a non-Federal Government party assumes observational responsibility, all NWS owned aviation and synoptic observation equipment will be removed and retained by the NWS forecast offices for future use or returned to the National Logistics Support Center (NLSC), Kansas City, Missouri.

APPENDIX A - Aviation Observing Program at National Weather Service Sites.

Introduction

This Appendix establishes NWS operating methods for the aviation weather observing programs at NWS-sponsored weather observing sites in the Alaska and Pacific Regions.

Procedure

At sites staffed by NWS employees or contract employees the NWS is responsible for the augmentation and backup of the automated weather observing systems, or the manually provided observation, operating under FAA Order 7900.5, Surface Weather Observing (http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1020629).

Quality Control

The Weather Forecast Offices and Weather Service Offices maintain a quality control program as instructed in Appendix C and NWSI 10-1305 Observational Quality Control - General.

Certification

The NWS provides weather observer certificates only to NWS-sponsored weather observing personnel in accordance with Appendix D of this NWSI.

Station Inspections

The NWS provides station inspections for their own sites in accordance with Appendix B of this instruction.

**APPENDIX B - Inspection Procedure Guidelines-at NWS Sponsored Aviation and
Synoptic Observation Sites**

<u>Table of Contents:</u>	<u>Page</u>
1. General	B-2
1.1 Purpose	B-2
1.2 Scope	B-2
2. Responsibility for NWS Organization	B-2
2.1 National Weather Service Headquarters (NWSH).....	B-2
2.2 Regional Headquarters	B-2
2.3 Weather Forecast Office (WFO).....	B-3
3. Pre-Inspection Activity and Guidelines	B-3
3.1 Advance Notification of Inspection	B-3
3.2 Advance Preparation for Inspection	B-3
4. The Observation Site Inspection	B-4
4.1 Frequency and Duration of Inspections	B-4
4.2 Conducting the Aviation and Synoptic Observation Program Review	B-5
4.3 Critique	B-6
5. Post-Inspection Activities	B-7
5.1 Station Inspection Reports	B-7
5.2 Action Items	B-8
5.2.1 Required of NWS Offices	B-8
5.2.2 Required for Contract NWS Offices and A-Paid Observers	B-8
5.2.3 Unsatisfactory and Conditionally Unsatisfactory Ratings	B-8
5.3 Disposition of WS Forms 10-13-9 and 10-13-10	B-8
6. Special Criteria.....	B-9
6.1 Unannounced Inspections	B-9
6.2 Station Ratings.....	B-9

1. General

An effective aviation and synoptic observing program depends on each observation site conforming to national and agency standards and guidelines. One of the most effective ways to ensure that standards and guidelines are being met is through first-hand evaluation of the observing programs at each staffed observing site. Visiting observing sites can also be used to provide initial and additional technical assistance, as time and resources permit.

1.1 Purpose

This appendix establishes standard guidelines for carrying out inspections of all aviation and synoptic observation programs and observation program management review by NWS field offices, NWSRH and NWSH.

1.2 Scope

Aviation and synoptic observation programs include:

- a. Staffed NWS observing offices including Weather Forecast Offices (WFOs), Weather Service Offices (WSOs) and Data Collection Offices (DCOs).
- b. NWS Contract Meteorological Offices (NWSCMO).
- c. Paid, Part Time Basic Stations (A-Paid, A-Voluntary).
- d. Synoptic Paid Stations (S-Paid).

2. Responsibilities of NWS Organization

NWS staff managing or working within the aviation and synoptic observing program are not required to hold an observing certificate in order to conduct station inspections.

2.1 National Weather Service Headquarters (NWSH)

NWSH will:

- a. Develop required documentation and forms.
- b. Coordinate interagency documentation requirements.

2.2 Regional Headquarters

Regional Headquarters will:

- a. Inspect the NWS field offices with aviation and synoptic observation program and/or with oversight of such programs.
 - (1) Routine inspection visits for observation program review by NWSRH personnel, or their assigned representative, should be made to staffed NWS offices at least once every two years.
 - (2) The supervisor of each field office should be notified of each planned visit as far in advance as possible. The supervisor should also be notified of any planned visits in their county warning and forecast area (CWA). Changes in the visitation schedule should also be brought to the attention of the field station.

- (3) At the discretion of the NWSRH, the person performing the aviation and synoptic observations inspection should review other station programs at NWS offices.
- (4) At the conclusion of the inspection, the NWS program management should be reviewed with the supervisor.

2.3 Weather Forecast Offices (WFO)

The supervisory NWS field office personnel inspect all aviation and synoptic observing sites within their CWA. The MIC is responsible for the visitation program, and should designate the individuals tasked to inspect observing stations. Individuals appointed to this task will be knowledgeable in the program reviewed.

- a. The supervisory field office Data Acquisition Program Managers (DAPM) or the Observing Program Leader (OPL) and Hydro-Meteorological Technicians (HMTs) (or other inspectors designated by the MIC) are responsible for:
 - (1) Visits to staffed observing stations to review and report on the observational programs and procedures, including the backup or augmentation of an automated system.
 - (2) Ensuring that the proper site exposure is maintained, e.g., whether new construction has caused an obstruction, and noting any conditions that would adversely affect the performance of the observing sensors.
- b. Electronics technicians (ET) are responsible for visits to staffed and Federal un-staffed automated observing stations for calibration of equipment and for ensuring continuous proper exposure of the surface observing sensors.
- c. Calibration, and the proper sensor exposure of the AWOS, is solely the responsibility of the FAA.

3. Pre-Inspection Activity and Guidelines

3.1 Advance Notification of Inspection

The MIC at each NWS field office and/or the supervising person of all other aviation and synoptic observing programs scheduled for inspection should be notified of each planned visit as far in advance as possible. Whenever practical, visits should be scheduled so that the supervisor of the aviation and synoptic observing program are contacted before the inspector begins work at the station and prior to departure.

3.2 Advance Preparation for Inspection

Prior to making an inspection, the person designated as the inspector should review all pertinent information regarding the station. Such advance preparation will permit the inspector, in many cases, to concentrate efforts in the particular station's known problem areas, thereby making better use of time. Include the following advance preparation activities:

- a. Consider type of observing program to be inspected and forms and checklists required (e.g., Weather Service (WS) Form 10-13-9 - "Aviation and Synoptic Observation Inspection Checklist" (figure B-1) and WS Form 10-13-10 - "Aviation and Synoptic Observation Station Inspection Report" (figure B-2)).

- b. Ensure all manuals and forms to be used are correct and up to date, (e.g., FAA Orders 7900.5, 7210.3 Chapter 2 Sections 9, 10).
- c. Review the previous aviation and synoptic program inspection report.
- d. Review reports from other regional and local forecast office personnel who recently visited the station.
- e. Review station personnel roster, making note of recent personnel changes. (Note: It is desirable for the inspector to recognize the names of all the observing and supervisory personnel at the station to be visited.) Prepare a list of certified observers from the regional listing (name, certificate number, and programs certified) for each station to be visited on WS Form 10-13-10. Review and update each list when checking the observer certificates at the station being visited.
- f. Review observing errors detected at the supervising office by use of computer based “check surface observation” programs or quality control reports from local, regional, and/or national sources.
- g. Review appropriate station description, instrumentation, and information forms (local and regional produced forms are also acceptable).
- h. Spot check recently transmitted observations and compare them with recorded observations if applicable.
- i. Determine the lowest instrument approach minimum (visibility/ceiling) for each station to be visited as published in the FAA Digital Terminal Procedures Publication (digital-TPP). This can be found at http://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dtpp/. Compare these values to those used at the station.

4. The Observation Site Inspection

The following guidelines are intended to assist inspectors from RH and supervising field offices in maximizing the effectiveness of observation site inspections:

4.1 Frequency and Duration of Inspections

Supervising field office or regional personnel should conduct inspection visits to all staffed aviation and synoptic observing sites at least once each year. Additional visits may be required for sites having recent changes in equipment, programs, or personnel, or when records indicate less than a satisfactory observation program exists.

- a. Allow sufficient time to completely review the observation program. Since observational programs vary in complexity and/or content, the visitation time can range from a few hours to a full day. Depending on requirements and availability, additional time may be needed for technical assistance.

4.2 Conducting the Aviation and Synoptic Observation Program Review

WS Form 10-13-9, Aviation and Synoptic Observation Inspection Checklist, is provided to assist the inspector in conducting a complete program review. Use of the form is mandatory. The inspector will find it helpful in that most significant aspects of the program are included in a checklist that can be retained for future use. It should also be used as an action item list, and if requested by the site supervisor and copying facilities are available, a copy should be left at the

field station. The checklist contains a rating column with identifiers for the observing program. Use the appropriate column for the type of station you are inspecting.

- a. The current version of the WS Form 10-13-9 and the WS Form 10-13-10 are available at: <http://www.nws.noaa.gov/om/forms/>.
 - (1) NWS ASOS augmentation and backup observation programs (WSO, NWSCMO, DCOs, etc.) NWS Manual observation programs.
 - (2) A-Paid, A-Voluntary, S-Paid NWS funded manual observation programs
- b. The inspection checklist includes, but is not limited to, the following areas:
 - (1) Arrangement of Observing Facilities. Determine if the site for taking visual observations satisfies the requirements in Appendix C, easy access is provided to evaluate the celestial dome, and the site is situated according to FAA order 7210.3 section 2-9-7. At airports, evaluate if the location of meteorological sensors comply with requirements established in the Federal Standard for siting Meteorological Sensors at Airports, which can be found at: <http://www.ofcm.gov/siting/text/a-cover.htm>. Briefly evaluate the lighting and safety of observing facilities and that the observer has unobstructed view of:
 - (a) At least half of each quadrant of the natural horizon with no more than 45 degrees continuous obstruction.
 - (b) At least 80 percent of the celestial dome (that portion of the sky which would be visible provided, due to the absence of human-made structures, there was an unobstructed view of the horizon in all directions from the observation site), and the ambient night lighting will not present a sky evaluation problem at the location.
 - (c) The direction from which weather most often approaches the station.
 - (2) Pressure. The pressure/altimetry program is one of the most critical elements at a surface observation site and is required to be thoroughly checked for equipment and observation procedure accuracy. Many programs depend on accurate pressure observations, and transmitted pressures are used by the FAA and other aviation interests for control and separation of air traffic.
 - (a) Pressure comparisons should be made by the inspector, comparing the traveling standard with the home station standard and backup instruments on each visit to **NWS sites**. Pressure comparisons for non-NWS sites are not required except for OCONUS offices.
 - (b) Pressure comparisons for ASOS should be accomplished by electronic technicians. Offices with Precision Digital Barometers (PDB) will provide comparisons as outlined in Appendix C Section 8. The inspector will check, comparing the traveling standard with the home station standard. Backup instrument checks will adhere to the below instruction.
 - (3) Temperature and Humidity. Proper exposure and accuracy of the temperature and humidity instrumentation (if needed) are critical in aviation weather observations. Proper exposure of primary instrumentation and for adequate backup should be checked closely, in accordance with Appendix C and agency specific requirements. Temperature comparatives should comply with the station's appropriate observing handbook.

- (4) Precipitation. Ensure precipitation equipment (if needed) is properly exposed and adequate back-up equipment is maintained in accordance with Appendix C. Observation procedures should be checked for compliance with instructions in the station's appropriate observing handbook.
- (5) Wind. Visual checks of the wind equipment (if needed) should be made to determine if readings appear to be accurate and are properly observed. Proper annotation of recording charts (when available) should be checked. Wind sensor exposure should be checked.
- (6) Ceiling. Review exposure and operation of equipment (if needed). Observation procedures should be monitored, and ceiling height tables should be checked for accuracy if appropriate. If recorder charts are still in use, ensure proper annotation.
- (7) Observing Procedures.
 - (a) Allow time to monitor the observer's routine duties for proper and efficient observation methods. At NWS offices and contract sites, the station should have a set of instructions for observing, disseminating, and quality control of observations.
 - (b) Review a sample of records for completeness, neatness, and accuracy if applicable. To ensure that observations have been correctly disseminated and that errors have been corrected properly on MF1M-10C forms, review several days of transmitted reports with the corresponding days of MF1M-10C forms (exception: many sites will not use forms and will be backing up automated systems).
- (8) Observational Aids and References. Check visibility charts for currency and proper format. Check that daytime and nighttime visibility markers are properly identified on the chart. Check the criteria of special observations for accuracy. The latest "FAA Digital Terminal Procedures Publication (digital-TPP)" should be used to check the local special criteria.
- (9) General. Check for administrative and miscellaneous items not covered elsewhere.

4.3 Critique

Upon completion of the station visitation, the inspector should verbally discuss strengths and discrepancies of the program as noted on the completed WS Form 10-13-9, Aviation and Synoptic Observation Inspection Checklist, with the station manager and the supervising observer. Leave a copy of the WS Form 10-13-9, if copying facilities are available, so corrective actions can be started.

5. Post-Inspection Activities:

5.1 Station Inspection Reports Upon completion of each station visitation, the inspector prepares a clearly written narrative report using the format on the form, WS Form 10-13-10, Aviation and Synoptic Observation Station Inspection Report. The report will include:

- a. Information requested in the heading:
 - (1) Name of station visited.
 - (2) Type of station inspected. Manual (NWS, NWSCMO, A-PAID, A-

- VOLUNTARY, S-PAID) or staffed automated (NWS, NWSCMO,
- (3) Person preparing report and title; should be the inspector.
 - (4) The supervising station and the dates of the visit.
 - (5) Station Rating.
 - (6) Type of visit, e.g. routine, follow-up, or unannounced inspection.
- b. Persons contacted.
 - c. Justification for rating.
 - (1) Any aspects of the station's program that is unusually favorable. In this category, include such items as might be adopted at other stations.
 - (2) An objective appraisal of the effectiveness of the observing program as conducted at the station. If rating is Unsatisfactory or Conditionally Unsatisfactory, identify the items (minuses) that contribute to that rating.
 - d. Specific actions which should be taken to improve the program or to correct the deficiencies. These may include instructional changes, facilities improvements, improvements in the program or personnel skills, etc. Establish a target date for the completion of each action and determine the responsible party.
 - (1) Contract sites are bound to the requirements of their contracts, so appropriate language should be used. The following terms should be used as guidelines:
 - (a) "Required" is used to describe an action that needs to be taken to achieve a satisfactory rating.
 - (b) "Recommend" is used to describe an action that should be taken to ensure a continued satisfactory rating.
 - (c) "Consider" is used to describe an action that is seen as a best practice but does not affect the rating.
 - (2) Whenever feasible, photographs of documented deficiencies, e.g., exposure of sensors, safety hazards, etc. should be included. These are especially useful for discussion purposes at the RH.
 - e. Concise assessment of each of the areas inspected.
 - f. Other information considered pertinent to the program.
 - g. A list of all observers and their certificate numbers.
 - h. Pressure comparison results, if applicable.

5.2 Action Items

Action items identified in the Checklist and Report shall be followed-up to ensure corrections to deficiencies have been corrected.

5.2.1 Required of NWS Offices

All follow-up action items should be accomplished as promptly as possible. Report the office's follow up actions in a memorandum to the RH as the actions are completed. In case the action is not completed within 30 days after the visit, the station should submit a progress report.

5.2.2 Required for Contract NWS Offices and A-Paid Observers

A copy of WS Form 10-13-10 should be provided to the contractor or paid observer within one week upon return to the home office. A response should be requested by a specified date to close

out any action items. A follow-up visit or phone call should be conducted to ensure deficiencies are corrected.

5.2.3 Unsatisfactory or Conditionally Unsatisfactory Ratings

If a station is rated unsatisfactory or conditionally unsatisfactory, notify the appropriate regional observing program manager. If the station is an NWS contract location, notify the NWS regional contracting officer's technical representative (COTR) as soon as possible. After each unsatisfactory or conditionally unsatisfactory rating, a follow-up inspection should be conducted within 30 days. The follow-up report shall address all items rated as unsatisfactory during the first inspection.

If an NWS station is again rated unsatisfactory during the follow-up inspection, take the following actions:

- (1) Contact the regional observing program manager
- (2) If the location is a NWS contract location, notify the NWS regional COTR immediately.
- (3) If after two follow-up visits, the program is still unsatisfactory, the observing program should be suspended for that location.

5.3 Disposition of WS Forms 10-13-9 and 10-13-10

Submit the completed WS Form 10-13-10 to the Inspection Database https://ocwws.weather.gov/intranet/observations_sites/pending.php. Provide a copy of the 10-13-10 to the station manager of the observing program that was inspected. Make available and distribute additional copies of the completed 10-13-10 form to other appropriate supervising offices (see regional supplements for distribution responsibilities).

- a. Retain completed WS Forms 10-13-9 and 10-13-10 at the inspecting field offices for at least 3 years and the 10-13-10 at the RH for at least 2 years.
- b. The latest Station Inspection Report, regardless of recency, should be retained at the inspecting field offices for information and continuity until superseded.

6. Special Criteria

6.1 Unannounced Inspections

On an occasional basis, unannounced or surprise inspections can be conducted. These unannounced inspections can be especially useful at contract weather observing locations to ensure performance is at a consistently acceptable level and to identify problem areas that would otherwise not be detected. The inspection official should have reasonable confidence of access to the station prior to the inspection visit being conducted.

- a. Unannounced inspections should be considered when a supervisory office has determined that a particular station's program has fallen well below the expected surface aviation and synoptic observing standards, and all other attempts to correct the situation have been exhausted. For example:

- (1) A station is a candidate for an unannounced inspection after a thorough review of the aviation and synoptic observing program has been conducted, and it is evident that the observational program does not conform with the established standards, or it is assessed that critical equipment verifications are not maintained (e.g., pressure comparisons if applicable).
 - (2) There are persistent observing errors as detected by the quality control program at the supervisory office, or by quality control reports from regional and/or national sources, and no effort is apparent from the station to improve despite repeated warnings.
 - (3) A station has a history of conditionally unsatisfactory or unsatisfactory ratings, constant follow-ups, and no improvement without constant urging.
- b. Reports from other sources recently visiting the station, or that maintain contact with the station, indicate irregularities deemed to be serious enough to compromise aviation safety. Reports of uncertified observers, sensors out of calibration, substandard sensors being used, observers sleeping during shifts, or leaving the observing facilities to perform other activities, etc., should alert the supervisory office that an unannounced inspection would be in order to determine whether the performance level of the station meets established standards.

6.2 Station Ratings

The overall rating of an aviation and synoptic observation station should be carefully considered.

- a. The following are guidelines for the station evaluation:
- (1) Excellent should be considered if all ratings on the WS Form 10-13-9 are pluses ("+") and in the opinion of the inspector, the station exceeds expected standards.
 - (2) Satisfactory should be considered if the minuses ("-") on WS Form 10-13-9 can be fixed quickly, and in the opinion of the inspector, the station meets or exceeds expected standards.
 - (3) Conditionally Unsatisfactory should be considered if the program has a significant number of minuses ("-") on WS Form 10-13-9, but not enough to warrant a rating of unsatisfactory. If the program fails to improve to satisfactory within 30 days, an Unsatisfactory rating will be given.
 - (4) Unsatisfactory should be considered if there are numerous minuses ("-") on WS Form 10-13-9 and in the opinion of the inspector, the station overall program does not meet or is below expected standards.
- b. The inspector's experience, and knowledge of the observing program, should allow them to detect the strengths and weaknesses of the station and should give the inspector the ability to recognize aspects of the observing program that would be unusually favorable. The rating of a station should not be determined solely by the number of pluses and minuses recorded on WS Form 10-13-9.
- c. The "grace periods" listed on the 10-13-9 for certain elements are the time limits for correcting unacceptable conditions. The 10-13-9 remarks section or the WS Form 10-13-

10 explaining an unsatisfactory rating will include the grace periods. This instruction is not intended to include every foreseeable situation; a station could be given a particular rating for any good reason that is well documented.

WS FORM 10-13-9 (11-09) (Ref. NWSI 10-1301)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE						
AVIATION & SYNOPTIC OBSERVATION VISIT CHECKLIST							
Observing Station	<table style="width:100%; border: none;"> <tr> <td style="border: none;"></td> <td style="text-align: center;">Type of Facility</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> ASOS</td> <td style="border: none;"><input type="checkbox"/> AWOS <input type="checkbox"/> Manual <input type="checkbox"/> Other</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">Describe Other: _____</td> </tr> </table>		Type of Facility	<input type="checkbox"/> ASOS	<input type="checkbox"/> AWOS <input type="checkbox"/> Manual <input type="checkbox"/> Other		Describe Other: _____
	Type of Facility						
<input type="checkbox"/> ASOS	<input type="checkbox"/> AWOS <input type="checkbox"/> Manual <input type="checkbox"/> Other						
	Describe Other: _____						
Date of Visit	<table style="width:100%; border: none;"> <tr> <td colspan="2" style="text-align: center;">Service Standard Level (for ASOS/AWOS Facilities)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> A</td> <td style="border: none;"><input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> N/A</td> </tr> </table>	Service Standard Level (for ASOS/AWOS Facilities)		<input type="checkbox"/> A	<input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> N/A		
Service Standard Level (for ASOS/AWOS Facilities)							
<input type="checkbox"/> A	<input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> N/A						
Prepared by	<table style="width:100%; border: none;"> <tr> <td style="border: none;"><input type="checkbox"/> NWS</td> <td style="border: none;"><input type="checkbox"/> A-Paid</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> NWSCMO</td> <td style="border: none;"><input type="checkbox"/> A-Voluntary</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> S-Paid</td> <td style="border: none;"><input type="checkbox"/> Other</td> </tr> </table>	<input type="checkbox"/> NWS	<input type="checkbox"/> A-Paid	<input type="checkbox"/> NWSCMO	<input type="checkbox"/> A-Voluntary	<input type="checkbox"/> S-Paid	<input type="checkbox"/> Other
<input type="checkbox"/> NWS	<input type="checkbox"/> A-Paid						
<input type="checkbox"/> NWSCMO	<input type="checkbox"/> A-Voluntary						
<input type="checkbox"/> S-Paid	<input type="checkbox"/> Other						
Title							
Supervising Station							
<p>Instructions: Use this checklist during the visit. Make entries and remarks as required or necessary. Use the appropriate column to rate the type of observing program you are checking, as identified below. Shaded box indicates this item is not normally used in this type of program. "NA" may be annotated when item is Non-Applicable.</p> <p>Disposition: File this with the Station Inspection Report, WS Form 10-13-10.</p> <p>Type of Observing Program: Use the numbered column under "Rating" corresponding to the type of observing program listed below. Completely shaded boxes indicate "NA", but can be used if appropriate to that site.</p> <p>1 = ASOS/AWOS Backup & Augmentation –NWS, NWSCMO 2 = Manual, Federal –NWS, NWSCMO 3 = NWS Funded Manual – A-Paid, A-Voluntary, S-Paid</p> <p>Ratings: Rate each item with either a "+", "-", or "NA". "+" can mean excellent, satisfactory, conditionally unsatisfactory, or yes. "-" can mean unsatisfactory, conditionally unsatisfactory, or no. An element receiving a "-" rating must have an explanation for corrective action to be taken or recommended procedures to follow.</p>							
Inspection Guide	Rating						
1. Arrangement of Facilities	1 2 3						
Location of observing site is adequate. (If no, explain in remarks)	Remarks						
	<input type="checkbox"/> Backup <input type="checkbox"/> Manual <input type="checkbox"/> Backup and Augmentation Remark _____						
2. Pressure	1 2 3						
Automated System <input type="checkbox"/> Primary <input type="checkbox"/> Backup	Remarks						
ASI/DASI <input type="checkbox"/> Primary <input type="checkbox"/> Backup	<input type="checkbox"/> ASOS <input type="checkbox"/> AWOS Remarks: <input type="checkbox"/> DASI <input type="checkbox"/> ASI						
→ All comparison corrections displayed at, or near, DASI/ASI. If not, instruct office							

	to post corrections.				
	Routine comparisons completed in accordance with FAA Order 7210.3, Chapter 2, Section 10. http://www.faa.gov/air_traffic/publications/atpubs/FAC/ (No Grace Period if Primary; 7 day Grace Period of Backup of Automated System)				
	Comparisons properly logged on MFIM-10				
	Comparison satisfactory with inspecting official's traveling standard if applicable. (NWS Sites only -7 day Grace Period for backup of automated systems.)				
	Surveyed Height of pressure sensor on file with NWS.				
	Correct height of instrument posted on or near the instrument.				
	Instruments installed properly. (No Grace Period)				
	Condition of instrument(s).				
	Backup available. (7 day grace period)				
	Backup Procedures for automated systems clearly understood by observers.				
	3. Temperature and Humidity	1	2	3	Remarks
	Temperature and dewpoint instruments properly functioning and in good condition. (30 day Grace Period)				List Instruments:
	Dewpoint properly computed.				
	Temperature and dewpoint backup provided for automated systems.				
	Temperature and Dewpoint data provided. (30 day Grace Period)				
	Weekly Hygrothermometer checks?				
	Condition of instrument shelter. Adequate supplies (muslin wicks, batteries, etc)				
	Location, general condition and exposure of instruments. (Where in use)				
	4. Precipitation	1	2	3	Remarks
	Condition of precipitation equipment. (Identify type(s) in remarks) (Where in use)				
	Condition of snowboard				
	Measuring stick				
	Exposure of precipitation measuring instruments. (Where in use)				
	Correct procedures used in measuring and identifying precipitation.				
	5. Wind	1	2	3	Remarks
	Method for determining Direction and Speed properly. (Identify method in remarks)				Remarks: _____
	Estimation Procedures understood by Observer.				
	Identify System or Sensors used for backup				
	Exposure of equipment.				
	Equipment meets minimum accuracy standards. (30 day Grace Period)				
	6. Ceiling	1	2	3	Remarks

AVIATION & SYNOPTIC OBSERVATION VISITATION CHECKLIST (con't) page 3 of 4

LBC's balloons, ceiling lights, clinometers in satisfactory condition.				
Operation of equipment understood.				
Helium available and safely stored. (Where balloons are in use)				
Observational procedures for backing up automated equipment followed. (Where balloons are in use)				
7. Observing Procedures	1	2	3	Remarks
Aviation Service Level responsibilities understood. (Automated systems sites)				
Proper Log on/off procedures followed for ASOS/AWOS.				
Observers familiar with visibility markers.				
Observers understand correct procedures for reporting and backing up prevailing visibility for ASOS/AWOS				
Tower Visibility reported correctly.				
Pilot reports utilized.				
Remarks encoded properly when required.				
Corrections to observations performed as required.				
Adequate arrangements for notification of observers in the event of an aircraft mishap.				
Observers understand correct procedures in the event of an aircraft mishap.				
Examination of observing certificates.				
All observers certified and current. (No Grace Period)				
Are there Quality Control/Quality Assurance of observations conducted on site.				
Review of 30 day record of observations. (Manual sites only)				
Electronic WS Form B-14 (www.nws.noaa.gov/om/forms/) properly completed and transmitted to the surface.qc@ncdc.gov.				Where appropriate
All recorder charts annotated as required by Observing Handbooks. (OCONUS sites)				
Electronic MF1-10c (www.nws.noaa.gov/om/forms/) properly completed and transmitted to the surface.qc@ncdc.gov				Where appropriate
8. Observational Aids and References	1	2	3	Remarks
Visibility charts available. (30 day Grace Period)				
Night time visibility markers indicated				
Cloud Atlas or cloud charts available.				
Table of Speci criteria available and correct.				
FAA Order 7900.5 current and available.				
FMH #2 available. (S-Paid / Pacific Region only)				
Appropriate ASOS or AWOS guides available.				
Other aids available. (Training guides, Users Guides, station duty manual, reference guides, snow training, web links, etc.)				

9. General	1	2	3	Remarks
Required telephone numbers available. (supervising station, AOMC, etc).				
Valid agreement in place and signed. A-Paid, S-Paid)				
10. Rating/Comments				
<p>Overall Rating:</p> <p> <input type="checkbox"/> Excellent <input type="checkbox"/> Satisfactory <input type="checkbox"/> Conditionally Unsatisfactory <input type="checkbox"/> Unsatisfactory </p> <p>Provide justification for rating and any additional remarks:</p>				

Figure B-1. WS Form 10-13-9, Aviation and Synoptic Observation Visit Checklist

WS FORM 10-13-10 (10-09) Ref. NWSI 10-1301 AVIATION & SYNOPTIC OBSERVATION STATION INSPECTION REPORT ___ Manual ___ Staffed Automated	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE STATION AND TYPE PREPARED BY TITLE HOME STATION DATE(S) OF VISIT										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">RATING</th> <th style="width: 50%;">TYPE OF VISIT</th> </tr> <tr> <td>___ EXCELLENT</td> <td>___ COMPLETE VISITATION</td> </tr> <tr> <td>___ SATISFACTORY</td> <td>___ 1st FOLLOW-UP</td> </tr> <tr> <td>___ CONDITIONALLY UNSATISFACTORY</td> <td>___ 2nd FOLLOW-UP</td> </tr> <tr> <td>___ UNSATISFACTORY</td> <td>___ Other</td> </tr> </table>		RATING	TYPE OF VISIT	___ EXCELLENT	___ COMPLETE VISITATION	___ SATISFACTORY	___ 1 st FOLLOW-UP	___ CONDITIONALLY UNSATISFACTORY	___ 2 nd FOLLOW-UP	___ UNSATISFACTORY	___ Other
RATING	TYPE OF VISIT										
___ EXCELLENT	___ COMPLETE VISITATION										
___ SATISFACTORY	___ 1 st FOLLOW-UP										
___ CONDITIONALLY UNSATISFACTORY	___ 2 nd FOLLOW-UP										
___ UNSATISFACTORY	___ Other										
INSTRUCTIONS – Provide the results of the station inspection in narrative form following the outlined format. Distribute via email to the following: Station Inspected, Supervisory Station. Submit complete form to the Inspection Database. Include the type of station and the location identifier at a minimum in the email subject line. If station or supervisory station does not have email access, mail a hard copy.											
1. Persons Contacted: 2. Justification for Rating: 3. Actions with target completion dates: 4. Summarize the following areas inspected: a. Arrangement of Facilities: b. Pressure: c. Temperature and Humidity: d. Precipitation: e. Wind: f. Ceiling: g. Observing Procedures: h. Observational Aids and Facilities: i. General: 5. Other Comments:											
TOTAL CORRECTION OF MERCURY BAROMETER RELATIVE TO NWS PRIMARY STANDARD	BAROMETER NUMBER	TOTAL CORRECTION (From Block 56 on WS Form B-1)									

WS FORM 10-13-10
(10-09)

Figure B-2. WS Form 10-13-10, Aviation and Synoptic Observation Station Inspection Report.

APPENDIX C - Instrument Requirements and Standards for the NWS Aviation and Synoptic Observing Programs (Land)

<u>Table of Contents:</u>	<u>Page</u>
1. General	C-2
2. Standards for Sensors Used in the Observing Programs.....	C-2
3. Siting and Exposure of Meteorological Sensors	C-2
4. Visibility Charts	C-2
5. Visual Elements	C-2
6. Instrument Requirements and Standards for the NWS Aviation Observing Program.....	C-3
6.1 Commissioning Systems and Sensors.....	C-3
6.2 Relocating of Systems or Sensors.....	C-3
6.3 ASOS Sensors.....	C-3
6.4 Sensors for Determining Cloud Heights	C-3
6.4.1 Requirement for Cloud Height Indicators.....	C-3
6.4.2 Required Backup Equipment for Cloud Heights	C-4
6.5 Sensors for Determining Pressure.....	C-4
6.6 Temperature Sensors.....	C-5
6.7 Requirement for Backup Temperature Sensors	C-6
6.8 Wind Measuring Sensors	C-6
6.9 Requirement for Backup Wind Measuring Sensors.....	C-6
6.10 Visibility Sensors	C-6
6.11 Precipitation Gauges	C-7
6.12 Snow Shields.....	C-7
7. Instrument Requirements for the NWS Synoptic Observing Program	C-7
8. Precision Digital Barometer Comparison Procedures	C-8
8.1 NWS Offices with an Upper Air Program	C-8
8.2 NWS Offices without an Upper Air Program.....	C-8
8.3 ASOS Backup	C-9
8.4 Notification Procedure	C-9

1. General

This appendix describes the requirements and standards for meteorological sensors used in the aviation and synoptic observing programs staffed or overseen by the NWS. The standards are for sensor resolution, accuracy, siting and exposure. If standards can not be met by equipment in place, the standards should be achieved as stations are changed, equipment is installed, programs are modified, or new stations are established.

2. Standards for Sensors Used in the Observing Programs

The standards in this appendix pertain to individual instruments or meteorological sensors. For some automated systems, data collection platforms (DCP) integrate and disseminate sensor data. Any data provided by DCPs will meet standards set for the observing program the system supports. The minimum standards for accuracy and resolution of sensors used by aviation and synoptic programs are established by FMH #1. All sensors used in the aviation program staffed or overseen by the NWS will adhere to these standards. Section 6 contains a listing of the aviation observing program instrument requirements and standards. Section 7 contains a listing of the synoptic observing program instrument requirements.

3. Siting and Exposure of Meteorological Sensors

Standards will be followed as closely as possible to ensure uniformity of observations. Siting and exposure standards define and establish requirements. The implementation of these should be flexible to achieve a balance between meteorological representativeness, space availability, and cost effectiveness. The NWS will follow the guidelines documented in the Federal Standard for Siting Meteorological Sensors at Airports (<http://www.ofcm.gov/siting/text/a-cover.htm>).

4. Visibility Charts

All NWS aviation weather observing stations reporting visibility will have a visibility chart. If more than one location is used for visibility observations, a separate chart will be prepared for each location. The phrase "visibility chart" includes any documentation providing a graphical display identifying location and distance to day and nighttime visibility markers. The supervising official at a NWS-funded observing station is responsible for preparing and keeping the visibility charts current. The supervising WFO or RH will check visibility charts at the observing site for proper format and reasonableness during inspection visits.

5. Visual Elements

Observer has unobstructed view of:

- a. At least half of each quadrant of the natural horizon with no more than 45 degrees continuous obstruction.
- b. At least 80 percent of the celestial dome (that portion of the sky which would be visible provided, due to the absence of human-made structures, there was an unobstructed view of the horizon in all directions from the observation site), and the ambient night lighting will not present a sky evaluation problem at the location.
- c. The direction from which weather most often approaches the station.

6. Instrument Requirements and Standards for the NWS Aviation Observing Program

This Section provides minimum instrument requirements and sensor performance standards for conducting the aviation observing program staffed or overseen by the NWS. All backup instruments will meet the performance standards.

6.1 Commissioning Systems and Sensors

Activate and commission sensors of automated systems that are procured and maintained by the NWS before operational use. The commissioning of major systems, e.g., ASOS, will be in accordance with NWSPD 80-2, System Commissioning and Decommissioning. Individual sensors in automated systems will not be commissioned prior to the commissioning of the entire system. The commissioning of stand-alone individual sensors will be accomplished in accordance with NDS instructions. Commissioning or certification of Federal and non-Federal AWOS are the responsibility of the FAA.

6.2 Relocating of Systems or Sensors

Responsibility for managing and funding the relocation of observing systems or sensors rests with the agency requiring the move. Relocation of an ASOS will be approved by the ASOS Configuration Control Board before any move, in accordance with NWSI 30-1203, Configuration Management for Operational Systems.

6.3 ASOS Sensors

Details on sensors used at ASOS stations are given in the ASOS Site Technical Manual and the ASOS Users Guide (<http://www.nws.noaa.gov/asos/>).

6.4 Sensors for Determining Cloud Heights

The sensors used as cloud height indicators are a laser-beam ceilometer incorporated in an automated system.

6.4.1 Requirement for Cloud Height Indicators

All stations staffed or overseen by the NWS taking observations at airports with at least one precision approach runway will be equipped with a cloud height indicator.

Cloud Height Sensor Performance Standard		
Parameter	Accuracy	Range
Height of cloud base in feet	±3 Reportable Values	0 - 12,000 feet (minimum)
The resolution for sensors used as cloud height indicators is the reportable values for cloud heights as defined in the Federal Meteorological Handbook No. 1, Surface Weather Observations and Reports.		

Figure C-1. Cloud Height Sensor Performance Standard.

6.4.2 Required Backup Equipment for Cloud Heights

No backup equipment is required for reporting cloud heights. If backup sensors are used, they will meet the cloud height indicator performance standard.

6.5 Sensors for Determining Pressure

All stations staffed or overseen by the NWS will be equipped with an approved pressure sensor. All NWS staffed pressure sensors will be compared routinely following applicable procedures. Refer to Section 8 for procedures on comparisons. The following pressure sensors are approved for use at locations staffed or overseen by the NWS.

- a. ASOS/AWOS Pressure sensors. At any location with a commissioned ASOS or an AWOS, the automated pressure sensors will be the barometric home station standard (HSS) for the aviation program.
- b. Precision Digital Barometer (PDB). The PDB will be used as the barometric HSS for the upper-air program and other meteorological programs not associated with the ASOS. At NWS offices with both a aviation and synoptic observing program and an upper-air program, the ASOS will be the HSS for the surface observing program, and a PDB will be the HSS for the upper-air and other meteorological programs. The PDB will be used by NWS staffed and NWS Contract staffed locations as a backup sensor to the ASOS.
- c. Paroscientific Digiquartz model 760-16B. The Paroscientific model 760-16B is the traveling standard barometer directly traceable to the Primary Standard Barometer at the NWS National Pressure Standards Laboratory. The traveling standard will be:
 - (1) Used for comparing the ASOS pressure sensors by NWS electronics technicians.
 - (2) Used for comparisons with the PDB pressure sensors by NWS field operations staff.
 - (3) Returned to the NWS National Pressure Standards Laboratory annually for calibration.
- d. Precision Aneroid Barometers, Altimeter Setting Indicators, and Digital Altimeter Indicators. These sensors may be used in manual observing programs such as, A-Paid, and, at locations designated by the RH provided certification and calibration is traceable to the National Institute of Standards and Technology (NIST).

Pressure Sensor Performance Standard				
Parameter	Units	Accuracy	Range	Resolution
Station Pressure	Inches of Mercury	± 0.02 inches of Hg	22-35 inches of Hg	0.005 inches of Hg
Altimeter Setting	Inches of Mercury	± 0.02 inches of Hg	22-35 inches of Hg	0.01 inches of Hg
Sea-Level Pressure	Hectopascals	± 0.68 hPa	800-1100 hPa	0.1 Hectopascals

Figure C-2. Pressure Sensor Performance Standard.

6.6 Temperature Sensors

All NWS staffed stations will have a temperature and dew point sensor meeting the performance standards, unless otherwise stated. The following temperature and dew point sensors may be used in the aviation program.

- Hygrothermometer.
- Thermometers. Liquid-in-glass or electronic.
- Psychrometer. Liquid-in-glass or electronic.

Temperature/Dew Point Sensor Performance Standard				
Parameter	Units	Accuracy	Range	Resolution
Temperature	Degrees Celsius	± 1.1	-62 to -50	0.1
		± 0.6	-50 to +50	0.1
		± 1.1	+50 to +54	0.1
Dew Point	Degrees Celsius	± 2.2	-34 to -24	0.1
		± 1.7	-24 to -01	0.1
		± 1.1	-01 to +30	0.1

Figure C-3. Temperature/Dew Point Sensor Performance Standard.

6.7 Requirement for Backup Temperature Sensors

All stations staffed or overseen by the NWS will have a backup temperature and dew point sensor(s) unless otherwise noted. Where the hygrothermometer or similar system is the station standard, it should be backed up with any of the items listed in section 7. A liquid-in-glass thermometer system will include spare thermometers.

6.8 Wind Measuring Sensors

All stations staffed or overseen by the NWS will have a wind sensor meeting the performance standards. Wind measuring sensors should be mechanical, electrical, sonic, or other devices

meeting the wind sensor performance standard.

Wind Sensor Performance Standard				
Parameter	Units	Accuracy	Range	Resolution
Direction	degrees	±5 degrees when speed is ≥5 knots	1 to 360 degrees	10 degrees
Speed and Character	knots	±1 knot up to 10 knots ±10% above 10 knots	2 to 90 knots	1 knot
Wind Sensors used to support the aviation program will have the capability to generate a derivable 2 minute average wind speed and direction.				

Figure C-4. Wind Sensor Performance Standard.

6.9 Requirement for Backup Wind Measuring Sensors

No backup sensors are required for reporting winds. Backup wind direction and speed can be estimated. If backup sensors are used, they will meet the wind sensor performance standard.

6.10 Visibility Sensors

Visibility sensors are required at automated observing stations staffed or overseen by the NWS.

Visibility Sensor Performance Standard			
Visibility from Standard Visibility Sensor	Percentage of Data Within or Exceeding Given Range		
	At least 80% Within	No more than 18% Exceed	No more than 2% Exceed
0 through 1 1/4	±1/4	±1/2	±1
1 1/2 through 1 3/4	+1/4, -1/2	+1/2, -3/4	±1
2 through 2 1/2	±1/2	±1	±1
3	+1/2, -1	±1	±1
4 through 10	±1 RV*	±2 RV*	±2 RV*
*RV = Reportable value, all other values in miles.			

Figure C-5. Visibility Sensor Performance Standard

6.11 Precipitation Gauges

The NWS standard for measuring precipitation is the 8 inch non-recording precipitation gauge. All NWS staffed locations will have one. At NWS staffed locations, the 8 inch gauge will be used as back-up for ASOS.

Precipitation Gauge Performance Standard			
Parameter	Accuracy	Range	Resolution
Liquid Precipitation Accumulated Amount	± 0.02 inches or 4 percent of hourly amount (whichever is greater)	0-10"/Hour	0.01 inches
Snow Depth	0 to 5 inches- ± 0.5 inches >5 to 99 inches - ± 1.0 inch	0 to 99 inches (auto)	1 inch
Freezing Precipitation	Detection occurs whenever 0.01" accumulates	0 to 40 inches	0.01 inches
Frozen Precipitation (water equivalent)	± 0.04 inches or 1% of total accumulation	0 to 40 inches	0.01 inches

Figure C-6. Precipitation Gauge Performance Standard.

6.12 Snow Shields

At NWS staffed locations wind shields will be used on any operational or backup precipitation gauge at stations reporting data for climatology where the average annual snowfall is ten inches or more.

7. Instrument Requirements for the NWS Synoptic Observing Program:

Stations staffed or overseen by the NWS that provide synoptic observations will have, as a minimum, the following instruments adhering to the performance standards of the aviation observing program:

- a. Temperature sensors capable of providing ambient air temperature, dew point and daily maximum and minimum temperatures.
- b. An approved NWS pressure sensor,
- c. a wind direction and speed system, and
- d. an ASOS precipitation gauge, or a standard 8 inch precipitation gauge.
- e. Other equipment can be added to the station as necessary to satisfy additional requirements.

8. Precision Digital Barometer Comparison Procedures

This Section provides procedures and the form for conducting barometer comparisons using the precision digital barometer. Table C-1 provides a summary of the following policies.

8.1 NWS Offices with an Upper Air Program

At the time of annual calibration, the NWS field office will receive a replacement PDB from OPS12 at NWS headquarters, and notification to return the current PDB. The point of contact for replacement of these instruments is OPS12 at 301-713-1834.

A verification of the PDB readings will be conducted at least once every 6 months with the NWS Digiquartz Paroscientific Inc., model 760-16B Traveling Standard.

- a. The verification will be done by comparing the sensor pressure of the PDB with the Traveling Standard.
- b. The PDB and Traveling Standard will be positioned within 1 foot of each other in the vertical and 3 feet in the horizontal during the verification. The procedure will consist of two verification readings taken no less than 15 minutes apart. For each reading, the uncorrected sensor pressure will be read to the closest 0.001 inch of mercury (Hg). The verification will be documented using WS Form 10-13-4 (figure D-7).
- c. If both readings are within 0.007 inch of Hg when compared to the Traveling Standard, no further action is required.
- d. If either of the readings of the PDB deviates more than 0.007 inch of Hg from the Traveling Standard discontinue use of both instruments and consult with the regional surface program manager and the Maintenance Branch to determine which of the instruments may be deficient.

8.2 NWS Offices without an Upper Air Program:

The PDB will not be calibrated annually by the Pressure Standards Laboratory at these locations, but will be compared at least once every 6 months against the Traveling Standard.

- a. The comparison will be done by comparing sensor pressure of the PDB with the Traveling Standard.
- b. The PDB and the Traveling Standard will be within 1 foot of each other in the vertical and 3 feet in the horizontal during the comparison. The procedure will consist of two comparisons taken no less than 15 minutes apart. For each comparison, the uncorrected sensor pressure will be read to the closest 0.001 inch of Hg. The comparisons will be documented using WS Form 10-13-4 (8-05).
- c. If both readings are within 0.02 inch of Hg when compared to the Traveling Standard, no further action is required.
- d. If either of the readings of the PDB deviates more than 0.02 inch of Hg from the Traveling Standard, the PDB will be removed from service and returned to the NWS Pressure Standards Laboratory for recalibration.
- e. Every 5 years the Maintenance Branch will inform each NWS field site of the 5-year recalibration through the delivery of a replacement PDB.

8.3 ASOS Backup

No correction will be applied to the PDB when used as the operational backup to ASOS. If for any reason the ASOS pressure data is not available, PDB readings for altimeter and sea level pressure will be read and used to backup those elements in the aviation and synoptic observation.

8.4 Notification Procedure

OPS12 will be notified immediately of any deficient instrument. A replacement PDB will be shipped via overnight delivery. OPS12 will maintain the computer storage disks containing station dependent data, including r-values. The data files from these disks will be entered into the PDB's memory by OPS12 prior to a new PDB being delivered to field locations. NWS field staff should verify station dependent data within the PDB's memory upon receipt of the PDB.

Table C-1. Summary Table.

Precision Digital Barometer Comparison Policy			
Program	Function	Calibration	WFO Comparison Requirement
NWS Offices with an Upper Air Program and No ASOS	Home Station Standard/ Operational Barometer	<ol style="list-style-type: none"> 1) Initial calibration before deployment. 2) Annually after initial deployment. 3) Consultation with region and the Maintenance Branch if PDB deviates more than 0.007 inch from Traveling Standard. 	A verification of the PDB readings will be conducted at least once every six months with the Traveling Standard.
NWS Offices with an Upper Air Program and Collocated with a commissioned ASOS	<ol style="list-style-type: none"> 1) Home Station Standard/ Operational Barometer for Upper Air 2) Operational Backup to ASOS 	<ol style="list-style-type: none"> 1) Initial calibration before deployment. 2) Annually after initial deployment. 3) Consultation with region and the Maintenance Branch s more than 0.007 inch from Traveling Standard. 	A verification of the PDB readings will be conducted at least once every six months with the Traveling Standard.
NWS Offices with an ASOS and no Upper Air Program	Operational Backup to ASOS	<ol style="list-style-type: none"> 1) Initial calibration before deployment. 2) Recalibration every five years. 3) Recalibration required if PDB deviates more than 0.02 inch from Traveling Standard. 	The PDB will be compared at least once every six months with the Traveling Standard.
NWS Offices with no Upper Air and no ASOS Programs	Home Station Standard/ Operational Barometer	<ol style="list-style-type: none"> 1) Initial calibration before deployment. 2) Recalibration every five years. 3) Recalibration required if PDB deviates more than 0.02 inch from Traveling Standard. 	The PDB will be compared at least once every six months with the Traveling Standard.

WS Form 10-13-4 (8-05) Ref: 10-1301			U.S. Department of Commerce National Oceanic and Atmospheric Administration National Weather Service		Station:			
Precision Digital Barometer (PDB) Comparison/Verification Form See detailed instructions for preparation of form on page 2)			Station Elevation:		PDB Elevation:	Field Elevation (If applicable):		
Year/Quarter (1)	Traveling Standard Serial Number (2)	PDB Serial Number (3)	Readings from Traveling Standard (4)		Readings from PDB (5)		Differences from Traveling Standard (6)	
			1st reading (4a)	2nd reading (4b)	1st reading (5a)	2nd reading (5b)	1st reading (6a)	2nd reading (6b)

WS Form 10-13-4
 (8-05)
 Ref: 10-1301

Figure C-7. WS Form 10-13-4, PDB Comparison/Verification Form

Guide for Preparing Form

Headings: Enter Station name in plain language, e.g., WFO Green Bay, Wisconsin
 Enter Location as Latitude/Longitude e.g., 44.29 North 88.08 West

Col. 1 - Enter the year and quarter the comparison is made. The required verifications/comparisons should be made during the first month of each alternating quarter. The format for Year/Quarter should be consistent, e.g. 99/1st.

Col. 2 - Enter the serial number for the Traveling Standard used to compare the PDB.

Col. 3 - Enter the serial number of the PDB being compared.

Col. 4a - Enter the first sensor pressure reading from the Traveling Standard to the closest 0.001 inch of Mercury (Hg), e.g., 30.014

Col. 4b - Enter the second sensor pressure reading (taken at least 15 minutes away from the 1st reading) from the Traveling Standard.

Col. 5a - Enter the first sensor pressure reading (taken at same time as reading in 4a) from the PDB to the closest 0.001 inch of Hg.

Col. 5b - Enter the second sensor pressure reading (taken at same time as reading in 4b) from the PDB to the closest 0.001 inch of Hg.

Col. 6a - Enter the difference between 4a and 5a to the closest 0.001 inch of Hg.

Col. 6b - Enter the difference between 4b and 5b to the closest 0.001 inch of Hg.

For the upper air locations: Notify the regional surface observing manager and W/OPS12 at NWSH if either 6a or 6b exceeds 0.007 inches of Hg.

For non-upper air locations: Notify the regional surface observing manager and W/OPS12 at NWSH if either 6a or 6b exceeds 0.02 inches of Hg.

Figure C-8. Comparison/Verification Form (back side)

APPENDIX D - Certification of NWS Observers

<u>Table of Contents:</u>	<u>Page</u>
1. General.....	D-2
2. Applicability.....	D-2
3. Exemptions	D-2
4. Program Responsibilities	D-2
4.1 Office of Climate, Water, and Weather Services.....	D-2
4.2 NWS Regions.....	D-2
4.3 Field Supervisors	D-2
5. Qualifications	D-3
5.1 Vision	D-3
5.2 Options.....	D-3
5.3 Training.....	D-3
5.4 Demonstrated Skills Proficiency.....	D-3
6. Requesting the Examination	D-4
6.1 Submitting the Request.....	D-4
6.2 Examination Locations	D-45
7. Examination Handling	D-5
8. Administering the Examination	D-5
8.1 Certificate Qualification Statement.....	D-5
8.2 Proctor Instructions.....	D-6
9. Examination Grading and Results	D-9
10. Re-examination.....	D-9
11. Disposition of Aviation Examination Answer Sheets	D-9
12. Certification	D-9
12.1 WS Form 10-13-1	D-11
12.2 Certification Endorsements.....	D-10
12.3 Validation.....	D-11
12.4 Starting Observations.....	D-10
13. Maintaining Proficiency.....	D-12
13.1 Recency of Experience.....	D-12
13.2 Proficiency Quality Control	D-12
13.3 Lapsed Certificate	D-12
13.4 Canceled Certificates	D-12
14. Changes in Employment of Observer	D-13
14.1 Transfers	D-13
14.2 Retirements, Resignations, and Dismissals	D-13
14.3 Record of Canceled Certificates	D-13
15. Certificate Accountability	D-135
15.1 Contents	D-13
15.2 Certificate Numbers	D-14

1. General.

This Appendix prescribes the methods, assigns the responsibilities, and delegates the authority for the National Weather Service (NWS) observer certification program. Certification is the means employed by the NWS to officially sanction the NWS upper air and aviation weather observations, used in the preparation of forecasts and warnings, and the support of aviation operations.

2. Applicability

All individuals who take or validate officially sanctioned NWS upper air and aviation observations shall possess a valid Certificate of Authority. In the context of this program, a certified observer supervising an observer trainee assumes full responsibility for the validity of the observation taken by the trainee.

3. Exemptions

NWS Certificates of Authority are not required for the following classes of weather observations although the NWS also considers the observations official.

- a. Cooperative program observations, including supplementary data, river, rainfall, snowfall, snow depth, climatological observations, and severe storm reporting networks.
- b. Coastal marine and cooperative merchant ships.
- c. Pilot reports of in-flight weather conditions.
- d. Synoptic Observations. Certification testing is not required for taking, encoding, or disseminating synoptic observations. Observers designated to generate manual synoptic observations should have an assessment and demonstrate their practical ability to take synoptic observations.

4. Program Responsibilities:

4.1 Office of Climate, Water, and Weather Services

The Office of Climate, Water, and Weather Services (OCWWS) establishes certification standards and develops certification examinations.

4.2 NWS Regions

The Regional Directors or designate will administer the certification program in their area, issue Certificates of Authority to take official weather observations, and maintain accountability for each certificate issued. The Meteorologists-in-Charge (MICs) may be delegated the responsibility for the observer certification program within their County Warning Areas (CWAs).

4.3 Field Supervisors

Supervisors in charge of weather observation stations or facilities taking weather observations determine individual observer training needs, determine observer proficiency, recency of experience, and ensure only certified observers possessing a valid Certificate of Authority take or validate official aviation weather observations.

5. Qualifications.

An individual shall meet the vision standards, demonstrate skills proficiency, and attain a passing score on a certification examination for each type of weather observation program to attain certification. An upper air observer who also takes aviation weather observations shall be certified for both the upper air and the aviation observation programs.

5.1 Vision

The Federal Meteorological Handbook No. 1 (FCM-H1-2005) requires that an observer candidate should have distant vision of 20/30 (Snellen) in at least one eye, corrected if necessary. If an observer shall wear corrective lenses to meet the minimum eyesight standard, the observer shall also wear corrective lenses while taking official observations. The supervisor certifies that the candidate meets the vision standards when requesting the exam.

5.2 Options

The following methods may be used to determine if an observer candidate meets the standard:

- a. The observer candidate may provide a copy of a report for an eye examination conducted within the previous 12 months by an optometrist or ophthalmologist that indicates the observer candidate's visual acuity meets the standard.
- b. If the observer holds a valid driver's license and the vision requirements for that state's license is 20/30 or better in at least one eye, the observer can be validated to have the proper vision requirement.

5.3 Training

The NWS has no responsibility or obligation to provide aviation weather observer training outside the NWS. Private industry, and other Federal Agencies should provide training for its own personnel. Training schools in aviation weather observing are available through the private sector.

Training may be given in classes, on the job with a certified observer, or by self-study. The "Training Guide in Surface Weather Observations" is the only training material available within the NWS. The training guide is available at

<http://www.weather.gov/om/forms/resources/SFCTraining.pdf>.

5.4 Demonstrated Skills Proficiency

Before taking the written examination, individuals will demonstrate to the satisfaction of their supervisor or other designated certificated observer, the ability to take, record, encode, and disseminate timely and accurate weather observations in accordance with the practices and procedures established in the appropriate observing documents, FAA Order 7900.5C.

- a. **Aviation.** The assessment of a candidate's ability to take and record an observation, including reading instruments and identifying distant objects for visibility, should be accomplished on an individual basis with the evaluator. The candidate will be taken outside to evaluate real-time weather elements and is expected to properly encode the

observed elements on the MF1M-10C form, Surface Weather Observations (METAR/SPECI). Drawing pictures or illustrations of cloud layers and/or giving the candidate different weather scenarios to encode is acceptable only during clear weather days. However, these aids are to supplement the practical demonstration not replace it. All candidates are expected to evaluate and encode real-time weather elements. Where applicable, the candidate needs also demonstrate the ability to operate automated observing equipment and interfaces. For those offices lacking a full complement of weather instrumentation (hygrothermometer, sling psychrometer, wind sensor, and altimeter), the candidate may be presented with simulated data for those elements.

- b. **Upper-Air.** The assessment of a candidate's ability to take and record an upper-air observation should be accomplished on an individual basis with the evaluator. The candidate should demonstrate the ability to follow proper balloon inflation procedures, safety requirements, radiosonde preparation and pre-release procedures, along with editing and archiving of flight data. Candidates should know how to do comparisons and complete routine upper-air forms and documentation required for each site.

6. Requesting the Examination

Field supervisors should request the aviation or upper air examination from the NWS Regional Headquarters or designated WFO.

There are different series of paper examinations for upper-air certification. The examinations include generic questions along with questions pertaining to the radiosonde type used at a given location.

6.1 Submitting the Request

Certification examinations will only be given to individuals whose duties include taking weather observations.

The person who requests an examination for an applicant should notify the appropriate source by letter, fax, e-mail, or phone. All requests for examinations and certification changes should allow at least two weeks from the date of request to the desired examination date for the request to be processed and the examination delivered. All requests need to include the following:

- a. Name, location, phone number, and title of requester.
- b. Name (complete name including middle initial as it should appear on the certificate) of the candidate. **(DO NOT SEND SOCIAL SECURITY NUMBERS.)**
- c. The date the candidate is scheduled to take the examination.
- d. The location identifier and station name where the candidate will take the examination.
- e. The four-letter site identifier (SID) and station name where the candidate is scheduled to take observations.
- f. The address to which the certificate is to be mailed, if different from the requester.
- g. An e-mail address, if available. Some certificates may be sent as an email attachment in place of being mailed.
- h. A statement that the candidate meets the vision and proficiency requirements.

6.2 Examination Locations

Certification testing for observer candidates should be administered at the supervising WFO. However, if more convenient and agreeable to the supervising WFO, candidates may be administered the examination outside the supervising WFO provided the candidate's employer has requested the examination.

7. Examination Handling

The certifying examinations are administratively restricted. The Data Acquisition Program Manager (DAPM) or Observing Program Leader (OPL) of the forecast office, or the RH, will usually be assigned the examination custodian duties. Custodians are responsible for ensuring the documents are stored in a secure place and protected at all times. Custodians will not provide the answer keys to anyone other than NWS personnel grading the examinations at the forecast office or RH. Custodians will never give examinations or answer keys to any contract personnel for them to administer. Examinations administered to contract personnel shall be administered by NWS personnel. Examination questions, answer sheets, and keys will be controlled by the designated NWS custodian.

Precautions will be taken to ensure the security of the certification examination. No portion of the examination will be copied without prior approval of NWSH.

8. Administering the Examination

All examinations are to be taken closed book and field supervisors will designate responsible persons as proctors. When observers have current certification in Upper Air, and technology changes, the Upper Air tests will be open book. The time limit for all examinations is two hours, and the examinations will be completed at one sitting.

Each answer sheet shall be completed, including the date. The proctor will sign the answer sheet whether the examination is passed or failed. Scrap paper and a blank copy of MF1M-10C may be used during the examination.

8.1 Certificate Qualification Statement

Unless an individual has demonstrated proficiency, the examination will not be administered. A "Certificate Qualification Statement" (Figure D-1), from the employer is sufficient for this purpose. Alternately, a certified observer may sign the examinee answer sheet to indicate the demonstrated proficiency of the examinee is satisfactory. The certified observer indicating proficiency also needs to include his/her weather certificate number in the space provided.

Demonstrated proficiency may also be made to the proctor if the proctor is certified. In this case the proctor's certificate number is required. A copy of the "Certificate Qualification Statement" is included with each paper examination.

NATIONAL WEATHER SERVICE

Certificate Qualification Statement

The **CERTIFICATE QUALIFICATION STATEMENT** is completed when an applicant has satisfactorily demonstrated ability (to a certified observer) to properly take weather observations. **The Certificate should be used by those individuals who will be taking the written examination at a location other than their own facility.** The Certificate should be given to the proctor of the written certification examination. A certified observer's name and Weather Certificate Number is required if the supervisor is not the certified observer to whom the trainee demonstrated observer proficiency. The Certificate should be attached to the answer sheet by the proctor of the examination.

CERTIFICATE QUALIFICATION STATEMENT

_____ is under my supervision and is assigned to
(Print test applicant's name)
take aviation weather observations at _____.
(Print test applicant's duty station)

His/her eyesight meets the vision standards specified in NWS Instruction 10-1301, Appendix D, section 5.1.

He/she has demonstrated the ability to take and record accurate and timely weather observations. I consider him/her fully qualified to perform these duties.

(Supervisor's Signature and Date)

(Weather Certificate Number)

(Certified Observer's Name)

(Weather Certificate Number)

Failure to include the required name/signature and certificate number on this form will delay or may suspend issuing the applicant's "Certificate of Authority to take Weather Observations".

Figure D-1. Certification Qualification Statement

8.2 Proctor Instructions

Administer the examination under close supervision to ensure proper security. Do not allow copying or discussion of examination questions. A question may be discussed to clarify its intent. However, it is not appropriate to discuss questions in such a manner to divulge answers. No person has the authority to say to the candidate that a particular question is inappropriate or

that a question does not have to be answered. All examinations will be equally administered and persons retaking an examination shall be given a different examination.

- a. **NWS Facility.** An examination may be administered at the RH by any member of the staff, including administrative or technical support staff. Examinations at all other NWS facilities may be proctored by any member of the WFO staff designated by the MIC including administrative or technical support staff. In most cases, the proctor will be the DAPM, OPL, or a Hydrometeorological Technician (HMT).

PROCTOR INSTRUCTIONS

- Unless an individual has demonstrated proficiency and meets the vision standards, the examination will not be administered.
 - A “Certificate Qualification Statement” from the employer is sufficient for this purpose.
 - A certified observer may also sign the examinee answer sheet to indicate that the demonstrated proficiency of the examinee is satisfactory.
 - Demonstrated proficiency may also be made to the proctor if the proctor is certified. In this case, the proctor’s certificate number is required.
- Collect any “Certificate Qualification Statements.”
- All examinations are to be taken closed book.
- Blank observation form and scratch paper are permissible. Form and scratch paper will be turned over to the proctor at completion of the examination.
- There is a 2 hour time limit for surface and upper air exams
- Examinations will be completed in one sitting.
- Use multiple examinations when more than one person is being tested.
- Each person taking an examination must show a picture identification unless the proctor knows the individual, i.e., make sure the person taking the examination “is who they say they are.”
- Ask each examinee if they have ever taken this examination or another NWS aviation test before.
 - If an examination has been taken during the past two weeks, do NOT administer the examination.
- Instruct the examinee to place a circle around the selected answer.
- Ensure each answer sheet is properly completed.
 - The name of the examinee will be printed as it will appear on the observing certificate.
 - The Test Series is either 2000(1), 2000(2), 2000(3), etc.
 - Station name is to be complete.
 - Four-letter station identifier is not sufficient; include the type (WFO, WSO, etc.), name, city, and state.
 - If multiple locations, make sure this information is included.
 - Ensure the “date” of the examination is complete. This is necessary as a record to determine when another examination can be administered.
- Persons taking the examinations will not be allowed assistance during the examination except to possibly clarify a question’s intent.
 - The clarification must be accurate and not mislead the examinee.
 - The discussion will be in such a manner not to divulge the answer.
 - Discussion of the questions after the examination is not permitted.
 - Remember, keep in mind the purpose of the examination is certification rather than training.
- The proctor will sign the answer sheet whether the examinee passed or failed.

Figure D-2. Proctor Instructions for Aviation Examinations

9. Examination Grading and Results

Depending on regional requirements, an examination may be graded either at the RH or the WFO.

- a. No office employee has the authority to change answers on any examination for any reason. Questions and/or answers not consistent with Federal Meteorological Handbooks will be brought to the attention of NWS Headquarters, OCWWS, Observing Services Division (W/OS7) through or by the Regional office.
- b. Examinations will be graded in a restricted area away from the candidate. Mark all incorrect answers in RED, double checking to ensure accuracy.
- c. An 80 percent or higher score is a passing grade on all examinations. The candidate can be provided the results of the examination in terms of the number of missed questions and general area of needed improvement, but not the specific questions missed. Notify the candidate's supervisor or other designated official as soon as possible of the results (pass or fail only) of the written examination and status of the certification.
- d. Once the candidate has completed and passed all certification requirements, the candidate can begin taking observations. The candidate does not have to wait for the actual certificate to arrive at the station.

10. Re-examination

Individuals who fail an examination shall wait two weeks from the day they took the previous examination before another examination can be administered. After the second failure, it may be necessary to extend the time until administering the next examination beyond the minimum two-week period to allow for additional training and study time. Discretion in determining the waiting period after a second failure will be left up to the office administering the examination, but shall not be less than two weeks. If an observer holding a valid certificate is re-examined and fails, the validity of the observer's certificate will be suspended until the observer has made a passing grade on a subsequent certificate examination. To request a re-examination, follow the procedures in Section 6.

11. Disposition of Aviation Examination Answer Sheets

All original answer sheets will be retained by the RH for five years, in accordance with the National Oceanic and Atmospheric Administration (NOAA) Records Disposition Handbook, chapter 100-12.

12. Certification

NWS Regional Directors or a designated representative, will certify all observers who meet the qualifications.

12.1 WS Form 10-13-1

WS Form 10-13-1, "Certificate of Authority to Take Weather Observations," (Figure 3) will be issued to those persons authorized to take weather observations.

The certificates may be transmitted electronically, only as PDF files, to sites that have the capability to receive them.

If a paper copy is being scanned, the following guidelines apply:

- a. The certificate should be signed with blue ink to easily identify the original from a photocopy.
- b. The signed certificate should be scanned and converted to a PDF file.
- c. The original signed certificate will be retained at the RH and the PDF file should be sent electronically to the supervisor.

If the certificate does not arrive at the observing facility within 45 days of the employee passing the examination, the supervisor should contact the appropriate WFO to determine the reason for the delay. The field supervisor will keep all certificates readily available for inspection. Certificates may be maintained electronically if they are easily accessible for inspections or other activities that require verification of observers' certification.

12.2 Certification Endorsements

The endorsement for each specific location and type(s) of observations the observer is qualified to take (e.g., Aviation, Upper Air) will be annotated on the WS Form 10-13-1 (Figure 3). Initial issuance of the WS Form 10-13-1 will be endorsed by the RH. Additional endorsements required to document the individual's certificate during an inspection may be accomplished by the supervising WFO at the discretion of the Regional office and provided the RH is notified of the changes.

12.3 Validation

These are administrative actions designed for use by the issuing authorities to ensure only qualified individuals are assigned official observing duties.

Validation upon transfer provides the field supervisor the means to evaluate the job proficiency of newly assigned observers and provides the issuing authority the means to account for certificates. Validation shall be completed within 45 consecutive days from an employee's arrival date at the new duty station, otherwise the certificate lapses.

12.4 Starting Observations

The individual will be allowed 60 days after passing the examination to begin taking observations. After 60 days, no certificate will be issued without re-examination.

U.S. DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 National Weather Service - XXXXXX Region

Certificate No. _____ Date _____



Certificate of Authority to take Weather Observations

This is to certify that

is qualified and authorized to take weather observations subject to the conditions stated in the National Weather Service Policy Directives.

Dean P. Gulezian

Regional Director – Eastern Region

IMPORTANT:

1. A certificate shall remain valid provided:
 - a. The observer maintains proficiency.
 - b. The observer takes, encodes, and records on the official station log the type of observation for which the certificate is valid and with the frequency stated in NWSI 10-1301.
 - c. The observer possesses the visual acuity required by NWSI 10-1301.
 - d. The field supervisor requests revalidation or recertification within 45 days of change of station.
2. Failure to comply with the above automatically causes the certificate to lapse. An individual cannot take an official weather observation with a lapsed certificate.
3. A certificate is cancelled if lapsed for 90 consecutive days.

DATE	LOCATION	TYPE OF OBSERVATION	INITIALS
09/28/06	Elmira, NY	Aviation	

CERTIFICATES MUST BE READILY ACCESSIBLE FOR INSPECTION AT ALL TIMES

Figure D-3. WS FORM 10-13-1 – Certificate Authority to take Weather Observations

13. Maintaining Proficiency

Certified observers shall maintain proficiency and demonstrate recency of experience in their assigned duties as listed below.

- a. **Aviation (NWS).** An observer will take at least one complete weather observation every 60 days. Observers signed-on to an automated observing system satisfy this requirement.
- b. **Upper Air Observations.** An observer will take at least one complete upper air observation every 120 days.

13.1 Recency of Experience

Certified observers shall demonstrate recency of experience in their assigned observing duties. If this standard is not met, the observer's certificate will lapse. An observer with a lapsed certificate cannot take official weather observations. Further, a certificate lapsed for 90 days is automatically canceled and will be returned to the issuing authority.

13.2 Proficiency Quality Control.

Any person holding an observing certificate issued by the NWS to take official weather observations may be asked at any time to demonstrate proficiency in taking the type of observations for which certified.

- a. Any NWS inspector or facility manager/supervisor is authorized to make such a request.
- b. An NWS inspector may perform proficiency checks of any observer at any location.
- c. Contract supervisors may perform proficiency checks at their respective facilities only.
- d. Authority to temporarily suspend an observer's certificate due to poor performance and/or threat to aviation safety may be granted to any NWS inspectors provided they first discuss the situation with the supervising WFO. If the supervising WFO concurs with the recommendation, then the NWS inspector may temporarily suspend the observer's certificate, placing the certificate in a lapsed state.

13.3 Lapsed Certificate

A lapsed certificate is a temporary suspension of the certificate's validity caused by failure to revalidate the certificate upon transfer, failure to maintain recency of experience, or poor observer performance. A lapsed certificate may be reinstated by the local supervising WFO whenever the conditions causing the temporary suspension have been corrected.

13.4 Canceled Certificates

Canceling certificates revokes their validity. Certificates are canceled when:

- a. Observers transfer from the jurisdiction of the issuing authority.
- b. Observers terminate employment and are not re-employed as observers within 90 consecutive days.
- c. A certificate has lapsed for 90 consecutive days.
- d. An observer fails to maintain the certification qualifications stated in this instruction.

14. Changes in Employment of Observer

The supervisor at the local observing site is responsible for notifying the supervising WFO or RH, when there is a change in location of certified weather personnel within 45 calendar days.

14.1 Transfers.

Upon transfer to a new duty station, an observer's certificate lapses after 45 days from arrival unless the certificate is validated by the issuing authority to include the new station. To avoid any delays in validation, transferee's certificates should either be hand carried or promptly mailed to the field supervisor of the new duty station. The field supervisor at the new duty station should ensure that the transferee meets the qualifications in Section 5.4 before requesting validation from the issuing authority serving his/her station. A memorandum or e-mail may be used for this purpose. The field supervisor should retain a duplicate copy on station to serve as temporary certification authority until the action is completed. If the local supervisor or contractor does not notify the NWS within 45 calendar days from an employee's arrival or departure date, the certificate becomes lapsed. An observer with a lapsed certificate cannot take official weather observations until the certificate is reinstated. If a certificate is not validated for the new station within 90 calendar days from an employee's arrival or departure will result in the cancellation of the observer's certificate.

14.2 Retirements, Resignations, and Dismissals

When a certified weather observer terminates his/her employment as an observer, the field supervisor will annotate the observer certificate with the reason employment was terminated and the effective date of termination. The annotated certificate will be returned to the issuing authority for cancellation. Canceled certificates due to termination of employment may be reinstated provided the time period between employments is less than 90 days, and the observer has demonstrated observation proficiency at the new location. If the observer meets these two requirements, the supervisor will validate the information in a letter to the supervising NWS Office and request a certificate.

14.3 Record of Canceled Certificates

Unless litigation is pending for which an observer's certificate may be required, the issuing authority will retain a record of canceled certificates for two years before destroying the record. In the event of litigation, the certificate or record will be retained for an additional two years after the completion of the litigation before it is destroyed.

15. Certificate Accountability

NWS Regions will establish a system to account for each certificate issued.

15.1 Contents

Minimally, the accountability system will include:

- a. Name of holder,
- b. Type(s) of observation(s) for which certified,
- c. Location(s) for which certified,
- d. Assigned certificate number and,

e. Date of issue.

15.2 Certificate Numbers

Whenever possible, Aviation certificates at Pacific and Alaska Regions should number the certificates consecutively using the block of numbers listed below. Once a number has been used, do not repeat it on any subsequent certificates. If additional numbers are needed, prefix a "1" before the block assignment. Example: Alaska Region 150,000, 150,001....

Alaska Region	Numbers 50,000 through 59,999
Pacific Region	Numbers 60,000 through 69,999

Upper Air certificates should continue to be numbered as before, with the 4 contiguous Regions using previously assigned numbers.