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## CHAPTER 3

### CERTIFICATION AND QUALITY CONTROL

#### 3.1 General

In order to ensure validity and reliability of the Federal Government's meteorological data, the use of standards, certification, and quality control must be an inherent program element. Without these essential elements, the credibility of the Nation's climatological database would become suspect and invoke mistrust.

#### 3.2 Scope

This chapter prescribes the general standards for certification of observers and quality control of weather observations. It separately addresses the standards and procedures applicable to all stations. It also discusses the requirement for quality control at National Centers.

#### 3.3 Certification Requirements

**3.3.1 Certification of Observers.** Agencies shall have an observer certification program, and only observers certified through that program shall be authorized to take weather reports. The NWS shall have the responsibility for certifying observers at all civil stations.

The certification of the observer shall attest to the fact that in the view of the certifying agency the observer has:

- a. **Acceptable vision.** The observer shall have distant vision of at least 20/30 (Snellen) in at least one eye, corrected if necessary.
- b. **Adequate Training.** The level of training would be commensurate with the level of the weather reporting function to be undertaken by the candidate.
- c. **Demonstrated Ability to Take Required Weather Reports.** This demonstrated ability would be dependent on the level of the weather reporting function to be undertaken by the candidate.

**3.3.2 Certification of Stations.** All stations where weather reports are taken shall be approved by the responsible agency. The procedures for the approval shall also be established by that agency. The procedures shall include verification that:

- a. the instruments to be used meet the minimum standards for accuracy, range, and resolution for weather elements as prescribed in this document (Appendix C);
- b. the installation of the automated sensors satisfy the siting requirements prescribed in the *Federal Standard for Siting Meteorological Sensors at Airports*;
- c. the algorithms used in automated sensors are in accordance with the algorithms prescribed in the *Federal Standard Algorithms for Automated Weather Observing Systems used for Aviation Purposes*;
- d. the proposed maintenance program to support the operation of the station is acceptable to the responsible agency; and
- e. all observers are certified at a level commensurate with their duties in accordance with this Handbook.

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### 3.4 Quality Control

**3.4.1 Quality Control of Observing Programs.** Each agency shall establish a quality control program to ensure that their surface weather reporting stations utilize proper procedures. The primary objective of the quality control program shall be to ascertain that:

- a. the siting and exposure of instruments is the best practical, and are still within acceptable limits;
- b. instruments are in good order and have been compared to the standard sensors, as required;
- c. standard procedures are being used to generate weather reports at the station;
- d. the observation program at the station satisfies the requirements for weather reports at that location; and
- e. any observers taking weather reports are certified.

### 3.4.2 Quality Control of Instruments and Sensors

- a. **Comparison of Portable Transfer-Standard Sensors.** Agencies shall establish a procedure to routinely compare portable transfer-standard instruments and sensors, which are used during station inspections, to standards that ensure compliance with the accuracy requirements, as listed in Appendix C, of this Handbook.
- b. **Comparison of Instruments and Sensors.** Agencies shall establish a procedure to periodically compare the instruments and sensors used at operational weather reporting stations to standards that ensure compliance with the accuracy requirements, as listed in Appendix C, of this Handbook.
- c. **Calibration and Standardization of Sensors.** Agencies shall establish procedures to calibrate and standardize sensors. Calibration and standardization should be performed at least annually, after installation, and after any major maintenance is performed on a sensor.
- d. **Routine Maintenance.** Each agency shall establish a schedule of maintenance for equipment at stations. Unless relieved of the responsibility, observers at stations shall determine the operational acceptability of meteorological equipment consistent with agency policy. In addition to having the responsibility for the operational status of meteorological equipment, the observer shall also have the final authority for deciding the operational status of any meteorological equipment used in the weather reporting program.

**3.4.3 Quality Control of Weather Reports.** Each agency shall establish a near real-time quality control program for all stations. This program shall be used to quickly detect repetitious errors being made by observers at the station. The program may use station personnel or personnel at another location with access to the records and reports made at the station.

- a. **Pre-Dissemination Quality Control.** The quality control performed at surface weather reporting stations prior to any dissemination of the weather report is the most important of all quality control operations. Once an erroneous report has been given to users, it is impossible to ensure that corrections are received by that same group of users. Therefore, all operational weather reporting stations shall have as high a level of pre-dissemination quality control procedures as practicable. This check should consist of recalculating computed data, verifying the syntax of the recorded weather reports, and comparing the recorded weather report against the reports recorded on any local dissemination devices.
- b. **Post-Dissemination Quality Control.** All surface weather reports shall be checked at the site for errors after dissemination and prior to the next weather report. If possible, the disseminated report shall be compared with the original report to verify that no errors were generated during the dissemination process.

### 3.5 Quality Control Performed at Central Locations

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Insofar as possible, all agencies should implement quality control checking at a central location on a timely basis. Agencies shall devise a method to provide feedback to the observer in the case of errors detected in manual weather reports.

### **3.6 Customer Feedback**

Agencies shall encourage customers to comment on the performance of their observing programs. In this context, customers are anyone utilizing the data from the programs.

It is recommended that all public issuances of information on the observing systems include an address of the office designated to process customer feedback.