

***NATIONAL WEATHER SERVICE CENTRAL REGION SUPPLEMENT 03-2004  
TO NWSI 30-1301  
July 13, 2009***

***Maintenance, Logistics, and Facilities  
Quality Assurance NWSPD 30-13  
Quality Assurance Program NWSI 30-1301  
Quality Assurance Program***

---

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

**OPR:** W/CR42 (B. Brashears)

**Certified by:** W/CR4 (T. Schwein)

**Type of Issuance:** Routine

---

**SUMMARY OF REVISIONS:** This directive supersedes CRS 03-2004 dated May 10, 2005.

//signed by// June 29, 2009  
Lynn P. Maximuk Date  
Director, Central Region

## Quality Assurance Program

<u>Table of Contents:</u>	<u>Page</u>
1. Introduction.....	2
2. Quantifying a WFO’s Electronics Maintenance Program .....	2
2.1 WSR-88D.....	2
2.2 ASOS .....	2
2.3 Upper Air .....	3
3. Data Quality .....	3
4. Preventative Maintenance.....	3
5. Cost minimization.....	3
6. Planning and Conducting Program Reviews .....	3
6.1 Regional Headquarters.....	3
6.2 Station Managers .....	4
6.3 Station Electronic Technicians .....	4
APPENDIX A.....	5
Central Region EMRS Guide	

1. Introduction This supplement establishes Central Region (CR) procedures for managing the Quality Assurance (QA) of a Weather Forecast Office’s (WFO) electronic maintenance program: quantifying a WFO’s electronics maintenance program; and describing procedures for planning and conducting program reviews.

2. Quantifying a WFO’s Electronics Maintenance Program. The goal of the CR’s maintenance program is to meet or exceed established system availability performance measures. The Availability statistics (A(s)) for all NWS data acquisition equipment available from the Engineering Maintenance Report System (EMRS) web page is based on all corrective actions with the Preventative/Routine Maintenance (PM) and Modification (MOD) hours factored out. Annual statistics will be based on any prior 12 month period.

2.1 WSR-88D. The EMRS group in National Weather Service Headquarters (WSH) monitors and reports on the A(s) of the nation’s WSR-88D radars. They compile monthly reports based on EMRS entries by local WFO electronics staff. This information will be the basis of the A(s) used for the CR data. CR will use the nationally established 96% A(s) baseline to gage the individual annual WFO 88D system availability.

2.2 ASOS. In addition to the national statistics available through EMRS, data used to determine the A(s) of CR’s 228 Automated Surface Observing Systems (ASOS) will be derived from the non-routine maintenance hours entered in EMRS per site outage. CR will use the regionally established 98% routine to non-routine hours as the baseline to gage the annual A(s) of individual ASOS systems.

2.3 Upper Air. Data used to determine the A(s) of CR's Upper Air sites will be based on the average of missed Upper Air flights in the national upper air program. CR will use the nationally established 10 missed flights as a baseline to measure the annual Upper Air A(s). If NCEP denies a second release the office will not be charged a failure.

3. Data Quality. Data Quality is critical. Our data systems must be periodically calibrated per established standards, procedures, and schedules to ensure accurate data. Maintenance programs must meet or exceed data quality performance targets to be considered satisfactory.

4. Preventative Maintenance. Timely performance and reporting of preventative maintenance activities on all equipment is essential to our mission. PMs will be performed in accordance with all rules and instructions germane to the equipment – ASOS Site Technical Manual S100 for ASOS, PMI Work Cards for WSR88D etc. Optimally PMs will be performed within the following time frames:

<b>PM INCREMENT</b>	<b>Earliest date to begin:</b>	<b>Latest date to complete:</b>
Weekly (2)	3 days prior to due date	3 days after due date
Semi-Monthly (3)	5 days	5 days
Monthly (4)	7 days	7 days
60 day (5)	10 days	10 days
Quarterly (6)	10 days	14 days
Semi-Annual (7)	10 days	21 days
Annual (8)	10 days	28 days

5. Cost minimization. While system availability and data quality are the primary objectives of our operations and maintenance program which must be met, we must also strive to minimize costs for required labor and supplies. Our goal is to minimize the costs while we meet or exceed all system availability and data quality requirements. As such, cost targets will not be established for evaluating the "quality" of the maintenance program. Instead, field and regional offices will collaborate to analyze information for identification of best practices, optimum local maintenance program procedures, facility and infrastructure needs, training, and other factors in order to achieve minimal costs.

6. Planning and Conducting Program Reviews. QA of the regional maintenance program is of paramount importance to the Regional Headquarters and also the WFO Station Managers.

6.1 Regional Headquarters. The Chief of the Systems and Facilities Division (SFD) has delegated the QA program responsibility to the Electronics Program Manager. Periodic reviews are conducted throughout the year by SFD personnel to insure WFOs are complying with various WSH directives (timely Lowest Replaceable Unit (LRU) return, timely MOD completion, timely PM completion, etc.). Desk audits are performed prior to annual station visits and/or WFO self evaluations. These audits give an indication of the overall health of a WFO's

electronics program. WFOs will be visited once every 4 years by SFD personnel using the checklist found at <http://intra/crh/admin/oversight/>. In intervening years WFOs will perform self evaluations using the same checklists. See CR Supplement filed with NWSPD 10-1607 for guidance concerning the evaluation checklists.

6.2 Station Managers. Station managers (MIC, HIC, ESA) must encourage the electronics staff to take timely maintenance actions and efficiently perform all maintenance activities, including timely reporting of all maintenance hours and actions in EMRS. See Appendix A - CR EMRS Guide - for clear guidance on coding for common tasks, such as Type Maintenance (TM), Action Taken (AT) and How Malfunction (HowMal) codes.

6.3 Station Electronic Technicians. Station Electronics Technicians are responsible for performing quality work and reporting electronics maintenance activities in EMRS in a timely manner. Optimally all EMRS entries should be committed within 14 days of the completion of the job. ETs should also keep the ESA apprised of any QA discrepancies in the work place.

## APPENDIX A

<b>The Central Region EMRS Guide</b>				
<b>Maintenance Performed</b>	<b>ET Comments (Examples)</b>	<b>TM</b>	<b>AT</b>	<b>HM</b>
<b>GENERIC (Any Equipment)</b>				
Major malfunction - system is down	Calibrated/aligned system	C	C	401
Major malfunction - system is down	Dialed into system; restarted without problem	C	E	901
Major malfunction - system is down	Fixed by replacing LRU & other parts; minimal troubleshooting required	C	R	401
Major malfunction - system is down	Lightning strike took out several LRUs & other parts; extensive troubleshooting & part replacement required	C	R	210
Complaints about any system	Problem fixed by replacement of small parts; (fuse/connector/bolt, etc., (NOT LRUs)	C	G	101
Circuit down - loss of data	Called TELCO, they fixed problem, circuit back up	C	J	204
Engine Generator Failure	Scheduled contractor maintenance & monitored activity	C	J	401
Contractor-maintained equipment failure	Contacted NCF, contractor, etc. Assisted contractor's repair efforts	C E	J J	401 401
Replace entire tape/CD drive	Removed & replaced entire Jukebox/CD/DVD recorder	C	R	401
Tape/CD drive not recording	Removed & replaced faulty tapes/CD (no hardware failure)	C	X	901
System failed over to backup	B440 failed over to 4BKUP - problem solved by rebooting	C	W	901
System went down, came back up by itself	Checked out system IAW EHB - no trouble found	Z	Z	301

System has alarms but is still running	Performed calibration/alignment; restarted with no alarms	1	C	406
System not working	Operator error (time spent troubleshooting - no malfunction)	1	Y	902
Weekly - Annual PM Due	PM completed (calibration/alignment required per EHB)	2-8	C	999
Weekly - Annual PM Due	PM completed (test, inspect, service per EHB - no calibration/alignment required)	2-8	X	999
<b>NEXRAD</b>				
Lin Channel Cal Degraded	Ran system in OLOP and auto cleared	C	E	401
Security Alarm at RDA	Adjusted sensor on gate	C	L	101
Modulator Switch Fail	R&R RBDT stack and calibrated	C	R	401
Trigger Amp Fail Alarm	R&R trigger amp and calibrated	C	R	401
Wideband Disconnect	Rebooted with a cleanstart command from RPG	C	W	301
Lin Channel Cal Degraded	Calibrated receiver	1	C	401
Generate Clutter Map	As needed clutter map generation - foliage transition to winter/summer, new obstruction, etc.	1	C	999
Front Panel Lamps Burned Out	R&R several lamps	1	G	101
Blower belt needs changed (no failure)	Replaced belt (not as a result of scheduled PM)	1	G	999
Noticed HVAC Intake Duct is Dirty	Vacuumed dust from duct (not as a result of scheduled PM)	1	V	999
Elev/Az Tolerance Exceeded Alarm	Cleaned slip rings (not as a result of scheduled PM)	1	V	101
Found air filter clogged	Replaced filter (not as a result of scheduled PM)	1	X	999
<b>ASOS</b>				
Numerous Sensors Missing	Commercial power failure - remotely	C	E	902

	cleared			
Data Quality Error on Sensor	Dialed into system; tested subsystem OK, cleared errors	C	E	406
Data Quality Errors - Weather Related	Dialed into system; tested, cleared (occurred during calm wind or icy/blowing snow conditions)	C	E	201
Present Weather Data Quality Error	Caused by blowing snow on lens	C	E	201
Tipping Bucket Data Quality Error	Deconfig/reconfig due to extreme weather conditions	C	E	201
Comms Failure	Caused by interference from FAA xmitters	C	E	204
Visibility Missing	Replace Blown Fuse	C	G	401
AFOS Modem Failure	Reseat modem - tested good	C	L	204
Ceilometer HW failure	Removed & replaced window conditioner	C	R	401
Visibility Missing	Replace faulty 24-volt power supply	C	R	401
Visibility Heater Failure	R&R cross arm assembly	C	R	101
Dirty Mirror Alarm	Cleaned and calibrated	C	V	101
Present Weather Data Quality Error	Cleared spider webs from lens	C	V	101
Daily/Weekly Remote Monitoring	Dial into system, check METARS for \$, etc.	Z	E	999
<b>Other Remote Systems</b>				
Any need to check out remote system	Dialed into system to check message/alarm/log	E	E	999
HQ requires info on remote system	Dialed into system to obtain HQ info per Maintenance Note	S	E	999
Daily monitoring of remote system	Dialed into system to check message/alarm/log	Z	E	999

<b>INFORMATION SYSTEMS</b>				
Computer frequently crashes	Upgraded to more stable OS	C	T	301
Computer inop due to corrupted software	Reload & configure Linux on WES	C	T	301
Hardware Upgrade	Installed new motherboard, power supply & memory	E	R	999
Bi-weekly System Admin Report	Include backups, performance checks, virus updates, etc.	E	Z	999
Computer frequently locks up	Ran diagnostic software	Z	D	901
Upgrade software	Upgraded to Windows XP and reinstalled all applications	Z	T	999
Software upgrades & security patches	Installed updates to McAfee, IE, Netscape, Adobe	Z	T	999
Locally scheduled PM	Clean, vacuum (monthly, quarterly, as required)	1-6	X	999
<b>MISCELLANEOUS</b>				
Activate new equipment using proper code	Equipment activated	E	A	999
Deactivate equipment no longer in service	Equipment deactivated	E	B	999
MIC wants equipment moved	Moved equipment	E	K	999
HQ Mandated mod on any major system:  Hardware Mod, Maintenance Note, RC Implementation, Other Mod (Special Acct)	Modification performed per instructions	M E E S	M M M M	999