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

NATIONAL WEATHER SERVICE INSTRUCTION 30-2104
MAY 13, 2024

Maintenance, Logistics, and Facilities
Systems/Equipment Maintenance, NWSPD 30-21

MAINTENANCE DATA DOCUMENTATION

NOTICE: This publication is available at: https://www.weather.gov/directives/.

OPR: W/OBS32 (C. Neidhart) **Certified by:** W/OBS3 (M. Hopkins)

Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 30-2104, *Maintenance Data Documentation,* dated October 16, 2017. Changes were made to reflect minor edits and changes to EMRS phone contact information.

BURNETT.WILLIAM.HOWELL.1122662078
Digitally signed by BURNETT.WILLIAM.HOWELL.1122662078
Date: 2024.04.29 11:50:49 -05'00'

Ajay Mehta Date
Director, Office of Observations

Maintenance Data Documentation

Table of Contents **Page**

1. Introduction

This instruction describes the Engineering Management Reporting System (EMRS) and the procedures necessary for collecting data used to assess the reliability and maintainability (R&M) of weather surveillance systems, facilities and infrastructure. These systems and facilities are operated, owned and/or maintained by the National Weather Service (NWS). The data collected by EMRS is vital to achieving maximum responsiveness to NWS missions.

EMRS is the primary field-level maintenance data collection, analysis, and maintenance workflow management tool used by NWS. EMRS data allows NWS to:

1. Determine systems R&M.
2. Anticipate systems and facilities maintenance requirements.
3. Measure the effectiveness of systems and facilities upgrades and modifications.
4. Provide configuration data for specific systems and facilities.
5. Provide evidence of a system's operational status for use in legal matters.
6. Monitor engineering resources expended on designated systems and facilities.
7. Provide program performance data.
8. Manage maintenance workflow at the weather forecast and field office.
9. Assess systems and facilities maintenance requirements, and evaluate key information used in maintenance workforce and staffing analyses for selected systems and equipment.

1.1 EMRS Data

The systems and facilities tracked by EMRS vary in nature. Systems such as weather surveillance radar are large, stationary, and composed of many subsystems and communication links. Other systems tracked in EMRS are small and portable. Some systems are located at remote locations, such as on mountain tops or on offshore oil platforms. Many systems are located at the WFO/Office. Facilities tracked by EMRS also vary in size, complexity, and location. Complex facilities such as the Weather Forecast Office include the physical building, heating/ventilation/air conditioning (HVAC), electrical, emergency power, and plumbing systems. Other less complex facilities are co-located with remote weather surveillance systems. These facilities may only include the physical building and electrical power.

There are three general classes of data in EMRS.

1. Equipment and facilities inventory.
2. Equipment, facilities, and infrastructure maintenance data.
3. Equipment maintenance activity information.

Data collected via EMRS is used to conduct periodic and ad hoc maintenance data analyses. NWS Program Managers, Regional Officials, field offices, other agencies, and the private sector request EMRS data to conduct these analyses. Typical analytical studies include equipment reliability,

maintainability, and operational availability. Equipment maintainability analyses are the primary method for assessing maintenance requirements and planning for future electronics staffing levels.

The information entered into EMRS is accessible in four different ways.

1. EMRS Data Entry System.
2. EMRS Web page at https://cbits.nws.noaa.gov/ords/emrsuser/emrs_main.home
3. End-user ad hoc query and analysis tools.
4. Standardized or ad hoc reports.

2. Scope

The maintenance reporting requirements of this document apply to equipment designated by the Directors of Office of Observations, Office of Dissemination, Office of Central Processing, Office of Facilities, Office of Science and Technology and Integration, and the NWS Regional Directors. Equipment codes for maintenance reporting are listed in Engineering Handbook 4 (EHB-4), Appendix C. Maintenance reporting begins with the activation of a system/sub-assembly at a site and continues through deactivation. All maintenance events, including corrective maintenance, equipment management, system modifications, preventive/routine maintenance, and testing activities are reported using EMRS. In addition, all Field Staff activities associated with contract maintenance, including contract maintenance oversight, is documented in the EMRS.

2.1 Filing Requirements

Once the Weather Service Form A-26, EMRS Maintenance Record is completed and has been entered into the system, it can only be modified by contacting EMRS staff (OBS323). There are no requirements to retain paper copies of the A-26 form after data has been committed into the EMRS Data Entry System.

2.2 Point of Contact

For information or assistance regarding EMRS, contact the WSH Surface and Upper Air Division, Services Branch, Configuration Management (W/OBS32-3) at (301) 427-9201.

2.3 Responsibilities

The sections below establish the following authorities and responsibilities.

2.3.1 Director, Office of Systems (OS)

The Director has overall responsibility for ensuring NWS-wide implementation of maintenance.

2.3.2 Directors, Office of Observations, Office of Dissemination, Office of Central Processing, Office of Facilities, Office of Science and Technology Integration, and NWS Regional Directors

The Directors are responsible for providing information essential to acquisition, operation, and support management. Their responsibilities include:

1. Recommendation of equipment designated for tracking within EMRS.
2. Defining requirements for reliability and maintainability, standards, and goals.
3. Compliance with NWS maintenance policy and EMRS procedures.
4. Assurance that personnel understand and carry out EMRS responsibilities.

2.3.3 Director, Surface and Upper Air Division (OBS3)

The Director, Surface, and Upper Air Division is responsible for implementing EMRS procedures and designating equipment for tracking via EMRS. These responsibilities include:

1. Developing and maintaining EMRS software and infrastructure.
2. Developing and maintaining EMRS processes and procedures that are planned, integrated, and developed in conjunction with maintenance, logistics, acquisition, engineering, configuration management, and safety/environmental directives.
3. Ensuring NWS employees have access to EMRS.

2.3.4 Meteorologist-In-Charge (MIC), Hydrologist-In-Charge (HIC), Official-In-Charge (OIC)/Station Manager

The MIC, HIC, OIC, and Station Manager are responsible for the day-to-day administration of EMRS procedures within their offices. They will ensure that:

1. Office staff comply with EMRS procedures.
2. Site-specific EMRS procedures and guidance are developed and implemented.
3. NWS staff responsible for EMRS reporting carry out their responsibilities.
4. Site personnel are aware of EMRS reporting requirements.

2.3.5 NWS Staff Reporting Equipment Malfunctions

Staff will comply with maintenance policy and EMRS procedures, initiating maintenance requests using the EMRS Data Entry System. If there is no access to the data entry system, staff will follow locally established procedures to ensure proper notification and routing of the maintenance request.

2.3.6 NWS Staff Performing Maintenance Activities

Staff performing maintenance and maintenance-related system administration on NWS equipment are responsible for documenting their maintenance activities using the EMRS Data Entry System. They are also responsible for completing all A-26s originated by other employees to request maintenance.

2.3.7 All Levels of Authority

All levels of authority will measure how effectively they have satisfied EMRS reporting requirements. All operating units will review EMRS maintenance activity, Operational Availability (A), and R&M reports provided by EMRS to ensure compliance and data quality/integrity.

3. General Instructions

The EMRS Data Entry System is a web-based data collection and maintenance workflow management tool. The system requires internet connectivity and a web browser to transmit and receive data from a centralized WSH database in Silver Spring, MD. The EMRS combines multiple phases of maintenance data collection, report generation, and maintenance workflow management into a single web-based application.

3.1 Accessing the EMRS

The EMRS is for official NWS use only. A valid username and password are required to access the system. Contact WSH Surface and Upper Air Division, Services Branch Configuration Management (W/OBS32-3) at (301) 427-9201 for information or assistance regarding access to EMRS.

3.2 Maintenance Record – A26

Use the WS Form A-26, EMRS Maintenance Record, to report maintenance activity on all equipment, facilities, and infrastructure designated for tracking in EMRS. Reportable maintenance activities include remediating equipment failures/outages, routine maintenance, maintenance-related system administration, equipment activations/deactivations, testing activity, and engineering modification implementation. For a complete listing of designated equipment, see document EHB-4, Appendix C.

3.3 Maintenance Data Reporting

Initiate an A-26 when a maintenance event occurs. A maintenance event is defined as any routine or non-routine maintenance activity associated with preventive maintenance, equipment failure, activation, deactivation, modification or when special sampling or testing is conducted. If more than one maintenance event is associated with a system or facility, an A-26 for each maintenance event is required. For example, if an electronics technician (ET) investigates a failure of a Radar Data Acquisition (RDA) equipment group, and a second ET investigates another non-related failure within the same RDA, each non-related maintenance event requires a separate A-26.

Enter all information regarding the maintenance event. Incomplete data may lead to confusion about the maintenance performed or the outage that occurred. Use the EMRS Data Entry System to request maintenance, manage maintenance workflow, and to document completed maintenance activities. If there is no access to the data entry system, NWS staff will follow locally established procedures to ensure proper notification of maintenance requests and documentation of maintenance activities.

NOTE: NWS Staff performing, documenting or assisting with maintenance on contract-maintained equipment are required to report the maintenance activity they accomplish. This includes contract monitoring, coordination, and oversight.

3.3.1 Reportable Maintenance Events

There are five types of reportable maintenance events:

1. Corrective Maintenance - The remedial action to correct failures and restore system/equipment or facility operation to prescribed capabilities and tolerances. This includes unplanned and non-periodic repairs, as well as systems administration, performed as a result of evidence indicating a failure has occurred or is imminent.
2. Equipment Management—The accomplishment of system/equipment or facilities activation, deactivation, relocation, and similar activity.
3. Modification - The authorized hardware and/or software configuration changes required to maintain/improve/extend system/equipment or facility operations/life or to satisfy new requirements.
4. Special Activity—The authorized short-term or limited collection of data (special sampling) typically associated with system/software testing, including system/equipment installation, relocation, modification, and other similar activities for a specific purpose.
5. Preventive/Routine Maintenance - Maintenance actions performed on system/equipment or facilities to ensure continued operation within the prescribed capabilities or to minimize failure probability. Routine maintenance includes scheduled, planned, or periodic preventive maintenance actions.

3.3.2 When to Originate an A-26

NWS Field Staff are required to submit an A-26 when:

1. A system/equipment, facility, or infrastructure failure occurs.
2. System/equipment or facility undergoes routine maintenance.
3. System/equipment or facility is relocated.
4. System/equipment or facility is activated, deactivated, or modified.
5. Special activity, hardware/software testing, or sampling occurs.
6. Maintenance-related system administration is accomplished.

3.3.3 When to Commit an A-26

The A-26 is committed when all activities associated with the maintenance event are concluded. The EMRS Data Entry System will not permit a maintenance record to be committed unless all mandatory data fields are entered and the data meets validation requirements for consistency and logic. If data types and logic do not match (e.g., the Close Date is later than the Current Date), a

warning will be displayed on the computer screen. When data validation is complete, the A-26 may be saved to the EMRS database.

NWS staff should complete an A-26 when:

1. An outage is cleared and the system/equipment or facility is returned to service.
2. An activation, deactivation, modification, or relocation is completed.
3. Regularly scheduled maintenance or routine system administration is completed.
4. Other maintenance activities are completed.

3.4 Disposition of A-26s

Once an A-26 has been saved to the EMRS database, it is not required to retain or forward hard copies to WSH.

3.5 Maintenance Data Quality Control

Automated and manual processes will be implemented by EMRS staff to provide primary quality control of EMRS data. All levels of authority are encouraged to review and monitor EMRS data to provide additional quality control measures. Equipment performance measurements and maintenance data trends are computed and analyzed. Staff-hour information accumulates and is monitored to assess maintenance staff requirements. Equipment/system failure rates and trends are monitored. Configuration management data is loaded and reviewed. Maintenance goals, processes, and directives are then modified to achieve maximum responsiveness to the missions of the NWS. All levels of authority will provide the final measure of data quality control. All operating units review and monitor EMRS data to provide additional quality control measures. All quality control processes of EMRS data will be performed in accordance with the standards set by NWSI 30-1301, Quality Assurance Program.

4. Engineering Handbook 4 (EHB-4)

This document, updated regularly, defines and provides in-depth details of the EMRS procedures necessary for collecting data used to assess the reliability and maintainability (R&M) of NWS weather surveillance systems.

The handbook can be found at: https://obs3.nws.noaa.gov/Secure/ehbs/EHB4/EHB_4.pdf

5. References

The following references also contain greater detail.

NWSPD 80-3, Systems Engineering

NWSI 80-305, Test and Evaluation

NWSI 80-307, Operational Test and Evaluation Process

NWSPD 30-11, Engineering Modifications

NWSPD 30-12, Configuration Management

NWSI 30-1201, Data Management

NWSI 30-1202, Engineering Drawings

NWSI 30-1203, Configuration Management for Operational Systems

NWSI 30-1204, Site Identifiers

NWSPD 30-13, Quality Assurance

NWSI 30-1301, Quality Assurance Program

NWSPD 30-21, Systems Maintenance

NWSI 30-2101, Systems Maintenance Management

NWSI 30-2106, Radar Maintenance

NWSI 30-2107, NOAA Weather Radio All Hazards Maintenance

NWSI 30-2111, ASOS Maintenance

NWSI 30-2112, Reporting Systems, Equipment, and Communication Outages

NWSI 30-2113, AWIPS Maintenance

NWSPD 30-22, Technical Orders

NWSI 30-2201, Engineering Documentation

NWSPD 30-31, Logistics Planning and Operations

NWSI 30-3101, Supply Manual and Catalog

NWSPD 30-41, Facilities Management

NWSI 30-4104, Operations and Maintenance

APPENDIX A. - ACRONYMS

Acronym	Description
A	Operational Availability
A-26	WS Form A-26, EMRS Maintenance Record
ACT	Activation(s)
CM	Configuration Management
DEACT	Deactivation(s)
EHB	Engineering Handbook
EMRS	Engineering Management Reporting System
ET	Electronics Technician
HIC	Hydrologist-In-Charge
MIC	Meteorologist-In-Charge
MOD	Modification(s)
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
NWSI	National Weather Service Instruction
NWSLI	NWS Location Identifier
OIC	Official-In-Charge
OBS	Office of Observations
R&M	Reliability and Maintainability
WFO	Weather Forecast Office
WS Form A-26	Weather Service Form A-26
WSH	National Weather Service Headquarters, Silver Spring, Maryland

APPENDIX B. - Glossary of Terms and Phrases

Term or Phrase	Definition
Activation	The entry of an equipment, sub-assembly, or system by EMRS equipment code, serial number, Site ID, and Activation Date, into the EMRS Equipment Population database.
Commit	The process of validating a completed A-26 form/record and marking it complete and final.
Deactivation	The removal of an equipment, sub-assembly, or system by EMRS equipment code, serial number, Site ID, and Deactivation Date, from the active section of the EMRS Equipment Population database.
EMRS Data Entry System	NWS staff use a web-based data collection and maintenance workflow management tool to request maintenance and report/record the maintenance activity from all maintenance events.
EMRS Procedures	The methods and processes necessary for collecting maintenance data are used to manage and assess the reliability and maintainability of weather equipment, systems, facilities, and infrastructure, as described by Engineering Handbook No. 4 (EHB-4).
End-User ad hoc query and analysis tools and standardized reports.	The EMRS "System and Equipment Statistics" web portlet contains more than 1000 dynamically generated reports that can be generated at the WFO/office, Regional, and National levels. System and equipment statistic reports are provided for each NWS Equipment Program. Maintenance staff and maintenance activity summary reports are also available on this portlet.
Equipment Code	The equipment code identifies the specific type of equipment, sub-assembly, or system being maintained, activated, deactivated, or modified.
Maintenance Request	The Maintenance Request form is the primary method NWS staff use to notify the Electronics staff and WFO managers of equipment or systems that have failed or require maintenance. The information entered on the Maintenance Request form is also used to initiate an A-26 form.

Term or Phrase	Definition
Maintenance Workflow Management	The EMRS Maintenance Workflow Management module is used to assist with managing maintenance processes. This includes viewing A-26 document categories, sending email notifications to selected individuals, and adding Maintenance Contractors that are not already in the EMRS system. A-26 status updates can be made and A-26 status notes can be added.
NWS maintenance policy	The official policy to properly maintain operational systems, equipment, and software to meet operational needs is described in National Weather Service Policy Directive 30-21.
Reliability, Maintainability, and Availability	Reliability measures failure frequency, Maintainability describes how soon the unit/system can be repaired, and Availability is the percentage of uptime during a specified time period.
Operational Status	There are three categories used to describe and measure (in hours/minutes) the level of compromise, or no compromise, of an equipment or system being maintained: Fully Operational, Partially Operational, and Not Operational.
System Administration - Maintenance Related	Managing software operating systems and overseeing systems performance including managing user access and privileges, configuring devices, making backups, training users, managing system security, and installing approved operating system software changes.
Weather Service Form A-26	The maintenance record/form is used to report maintenance activity on all equipment, systems, facilities, and infrastructure designated by the Chief of the Surface/Upper-Air Division.