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Operations and Services

Dissemination, NDS 10-17

NOAA WEATHER RADIO ALL HAZARDS (NWR) SYSTEMS MANAGEMENT

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SUMMARY OF REVISIONS: This directive supersedes NWSI 10-1711, "NOAA Weather Radio All Hazards (NWR) Systems Management," dated April 4, 2011. Changes made to reflect the NWS Headquarters reorganization effective April 1, 2015.

Additional changes replaced "Console Replacement System (CRS)" with "Broadcast Message Handler (BMH)".

Signed

Michelle Mainelli-McInerney
Director (Acting), Office of Dissemination

October 20, 2017

Date

NOAA WEATHER RADIO ALL HAZARDS (NWR) SYSTEMS MANAGEMENT

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1 Purpose of Document

This instruction describes how the National Weather Service (NWS) manages and operates the National Oceanic and Atmospheric Administration (NOAA) Weather Radio All Hazards (NWR) network.

2 Description

The NWR network consists of over 1000 very high frequency (VHF) Frequency Modulated (FM) radio broadcast stations located throughout the United States and its Territories, including Puerto Rico, U.S. Virgin Islands, Guam, and the Commonwealth of the Northern Marianas (Saipan) and American Samoa. Most stations are able to broadcast weather and non-weather related emergency messages and other routine content to receivers located within a 40 mile radius from the station. The broadcast provides advanced warning of potentially destructive and life-threatening situations, and gives NWR listeners time to protect family, home, and property.

2.1 Mission of NWR

The mission of the NWR network is to provide a continuous flow of timely weather forecasts, information, advisories, watches and warnings, as well as all-hazards (non-weather) warning information to 98 percent of the general public in the Primary Coverage Area (PCA) 99 percent of the time. The PCA is defined as the area enclosed by a received signal level contour of 8 micro volts per meter. Stations are designed to provide this level of signal at a nominal distance of 40 miles from the station. The size and shape of the PCA at each station is dependent on a number of factors, including the height and placement of the antenna on the tower, terrain and structures in the vicinity of the station, presence of large bodies of water in the immediate area, and transmitter output power. NWS personnel can activate Specific Area Message Encoding (SAME) within specific portions of a PCA.

Under normal circumstances NWR provides timely dissemination of weather forecasts and other meteorological and hydrological information to the general public. Under extreme conditions, where the public is at risk due to severe weather or other natural or human-caused disasters, NWR provides alarms, specific information describing the threat(s), and recommended actions to be taken.

Special receivers can trigger an audible alarm indicating an emergency exists for their area, alerting the listener to pay particular attention to the message being broadcast. Some of these receivers can operate in a muted mode and are automatically turned on when a warning message is received. Warning alarm or alert tone receivers and NWR SAME-capable receivers are especially valuable for schools, stores, sport complexes, hospitals, public safety agencies, news media offices, and any other public gathering areas. The hearing impaired community receives weather and hazard warnings via NOAA Weather Radios using special alerting devices connected to their receivers, such as strobe lights and pillow/bed vibrators. These warning devices plug directly into the NWR receiver and activate when a warning is received; the hearing impaired person then tunes their captioned television or computer to their normal source for news to get complete details.

NWR is available to relay non-weather related hazard alerts received from authorized local, regional and national emergency management agencies (See Appendix A). NWR is part of the National Response Framework, managed by the Federal Emergency Management Agency (FEMA), which is an all-hazards approach to domestic incident response. This framework identifies the key response principles, as well as the roles and structures that are needed to organize a national response. NWR is also a primary activator of the Federal Communications Commission (FCC) Emergency Alert System (EAS).

2.2 Components of NWR

Although a few transmitters were established as early as 1954, NWR was originally established as a broadcast network in the early 1970's. The number of discrete frequencies has grown from the original three to seven; allowing the NWR network to expand from 100 stations in the 1970's to over 1000 in 2008. Each station is remotely programmed from one of over 120 local Weather Forecast Offices (WFOs). Some of these are denoted as Weather Service Offices (WSOs). Each station consists of a radio frequency (RF) transmitter and an antenna interconnected with coaxial cable. Audio programming is delivered from a Broadcast Message Handler (BMH) at the WFO/WSO by means of a telecommunication link to the transmitter. Telecommunication links include ultra-high frequency (UHF) radio sets, private microwave networks or commercial telephone circuits, depending on local circumstances. The BMH capability located at each WFO is an integrated Advanced Weather Interactive Processing System (AWIPS) processing application feeding a Digital to Analog interface. BMH is designed to prepare, store, schedule and simultaneously deliver unique programs to station transmitters. Each BMH provides text-to-synthesized voice conversion, an alert tone for triggering special receivers for severe weather, and other life threatening hazardous events, and an NWR SAME signal used to target specific portions of the PCA.

Since the network has been in service since the 1970s, station equipment configurations vary from station to station. Transmitters at each station vary in type, manufacturer, configuration, and power output. Antennas vary according to area needs. Antennas are generally omnidirectional but may be directional to avoid sending a signal into an area where it may cause interference, to increase the signal level in a certain area, or to otherwise comply with the station operating license issued by the Interdepartmental Radio Advisory Committee of the National Telecommunications and Information Administration (NTIA). Most stations have emergency power available. Station facilities are owned by private companies, groups, individuals, or government organizations and are either leased or donated to the NWS. Maintenance and logistics are provided through numerous means including NWS Electronics Technicians (ET), the NWR National Maintenance Contract, regional and local maintenance contracts, or facility owner technicians.

3 Organizational Responsibilities

This section describes the responsibilities of the NWS Headquarters, Regional Headquarters, Weather Forecast Offices, and maintenance groups for NWR.

3.1 NWS Weather Service Headquarters (WSH)

The Assistant Administrator (AA) for Weather Services has overall responsibility for the WSH NWR program.

3.1.1 Office of Dissemination (DISS)

DISS provides staff assistance to the NOAA AA for Weather Services for NWR program management and configuration control. DISS provides program and financial management as well as operational, engineering and communications support for NWR. DISS oversees the maintenance of the NWR system, manages NWS telecommunication circuits, and provides WSH support for any commercial telecommunications services needed by NWR.

3.1.1.1 Dissemination Systems Team (DST)

DST has overall responsibility for the following:

1. Program management of the entire NWR network. This includes management of the expansion/contraction of the system, financial oversight of the operations and maintenance of the system, operating a national Website for NWR, and maintaining a national station database to manage the configuration for each station.
2. Contract management of the NWR transmitter acquisition contracts and the National Maintenance Contract (NMC). A NMC manager will be assigned as a focal point to provide technical management of the NMC. The NMC manager will also manage all inquiries, issues, and assistance concerning these contracts. The NMC manager will verify those items specified under the NMC are maintained to NWS standards and operational requirements.
3. Engineering and technical support for NWR stations, including BMH audio interface, telecommunications, and station components. This includes upgrades in technology and additional or remote monitoring systems.
4. Configuration management for the components of the NWR system located in the WFOs or at the transmitter stations. This includes tracking component locations, as well as establishing change management for replacement components within the system.
5. Technical and system management liaison with NWR stakeholders, including NWS WSH, Regional Headquarters, WFO NWR focal points, equipment manufacturers, other government agencies, and user communities. This will be accomplished through an NWR national focal point. The NWR national focal point is responsible for the NWR network, communications with the regions, cooperators, patrons, state and local governments, and for any resulting programmatic issues. The national focal point coordinates with the regional focal points to assist with station maintenance, relocation, configuration changes, and the addition/removal of stations to the network.
6. Outreach to government agencies, private organizations and to the public regarding NWR.

7. Supports frequency management of all NWR transmitters and RF telecommunication links.
8. Service requirements and instructions for NWR broadcast content and procedural instructions as described in [NWS Instruction \(NWSI\) 10-1710](#), *NOAA Weather Radio All Hazards (NWR) Dissemination*.

3.1.2 Office of Observations (OBS) – Services Branch

OBS32 supports system corrective and preventative maintenance requirements and establishes procedures for conducting maintenance as described in NWSI 30-2107. OBS32 tracks and reports measured performance baselines for the operational employment of NWR transmitters and devices.

3.1.3 Office of Central Processing (OCP)

OCP supports the hardware and software for the BMH running in each WFO which originates and controls the broadcast signal running to each of the transmitters.

3.2 Regional Headquarters

Each Regional Headquarter office is responsible for the program content of NWR within its region in accordance with DISS/DST direction. It is also responsible for the management of relocations, expansion/reductions and upgrade efforts for NWR stations in its area of responsibility and for coordinating with WSH on these activities. It is the responsibility of the Regional Headquarters to coordinate with the WFOs for problems or operational changes and to forward to the NWR Program Manager at WSH (DST), any network, system maintenance, or end-user problems which cannot be resolved at the local or regional level. The Regional Headquarters are responsible for maintenance on all NWS-owned transmitters that are not covered by the NMC. The Regional Headquarters will provide WSH DISS (via memorandum with a copy sent to DST) the information concerning the designated focal point(s) for the region, local NWR maintenance contractors, WFOs, and non-NWS stations (station managers and any other personnel designated as NWR focal points for those stations to whom service calls may be initiated on a normal and emergency basis). The information contained in the memorandum should include the focal point's name, e-mail address, and telephone number(s).

3.2.1 Regional Telecommunications Managers (RTMs)

RTMs are responsible for the acquisition and management of NWR telecommunications service used by NWR in their regions

3.2.2 Regional NWR Focal Points

Regional NWR focal points are responsible for coordinating and managing the NWR radio frequencies within their areas of responsibility. This includes timely submission of coverage assessments and inter-modulation studies for new stations, submission of Requests for Frequency Assignments to National Telecommunications and Information Administration, coordination with other NWR focal points when stations are in close proximity to common regional borders,

resolution of interference problems, and to include coordination with counterparts in Canada or Mexico (as necessary) in accordance with established International Telecommunication Union (ITU) guidelines, and the policies and agreements signed by Department of Commerce (NOAA and NWS inclusive) and Department of State.

The Regional NWR focal point initiates a proposal for NWR Network station additions, relocations, reductions or configuration changes. The proposal identifies the type of station, recurring and non-recurring costs and responsibilities, justification, factors for consideration, and special circumstances. The focal point submits the proposal to DST and the NWR Configuration Manager for review and approval of the relocation, removal or addition of the new station into the system. These proposed changes are to be approved before the changes can be implemented. A Request for Change (RC) template is available from DST.

3.3 Weather Forecast Offices

The NWS WFOs and WSOs are responsible for the daily operations and quality control of the NWR broadcast and are the main interface with the external end-user community. They notify the national maintenance contractor of transmitter system outages (if the station is maintained by the NMC) or notify the regional maintenance contractor or local NWS ET, as appropriate. They report outages in the Unscheduled System Outage System (USOS) so WSH DST can update the NWR outage reporting and webpage.

WFOs support relocations, removals or expansion and upgrade activities in their areas. Each WFO/WSO is responsible for designating a NWR focal point. This focal point ensures all NWR network equipment assigned to their office by their respective region headquarters is maintained in operational readiness according to established NWS policy, standards, and NWR operational requirements. WFO/WSOs focal points routinely monitor NWR stations, equipment, broadcast coverage, and contractor performance for quality assurance.

The local NWR focal point will coordinate and observe NMC work, as directed by the regional and national NWR focal points and the NMC Contracting Officer Representative (COR). The local NWR focal point will report back any discrepancies or issues as a result of NMC maintenance or emergency response.

The local NWR focal point will monitor and assist, as necessary, all state and local NWR stations and the respective contractors (if any) to ensure proper operation and maintenance of the NWR network and compliance with respective contracts or Memorandums of Agreement (MOA). Monitoring may be performed through remote testing using operational systems, random or scheduled station inspections, or in conjunction with contractor follow-up during corrective/preventative maintenance. The local NWR focal point reports all findings and issues to the regional NWR focal point. If an NWR station goes off-line, the local NWR focal point is communicates, coordinates assistance (if any), and reports to the respective NWR focal points as to contractor performance to resolve the problem.

3.4 Regional, State, and Local NWR Maintenance Contractors

Specific work requirements by regional, state, and local contractors should be detailed within specific contracts. One copy of each current regional, state, and/or local NWR maintenance contract (including any and all subsequent updates, changes, addendums and modifications) should be sent to the National NWR focal point (DST). The respective Contract Officer's Technical Representatives (COTR) must keep the regional NWR focal point aware of all logistics and maintenance issues. The regional NWR focal point assists the responsible COTR to resolve any emergency or issue concerning NWR operation or maintenance within their region.

3.5 Non-NWS Owned, Operated, and Maintained NWR Station Support

This includes the personnel maintaining stations not owned, operated, or maintained by NWS, or covered by the NMC, region, or local NWS contracts. They may be covered by federal, state, or local contracts through state or local government agency. The technical Point of Contact (POC) works through the regional NWR focal point for all NWR network, station, and equipment-related issues, including testing and logistic support. POC information for the respective maintenance personnel (NWR station identification/station name, first and last name, e-mail, telephone number, emergency and contact number) should be collected and maintained at Regional Headquarters. The regional NWR focal point should update this contact list and submit a copy to DST at the beginning of each fiscal year.

4 Broadcast Service Area

A broadcast service area for NWR transmitters is defined in NWS Instruction 10-1710, *NOAA Weather Radio (NWR) Dissemination*, Section 4. For the purpose of this document, the broadcast service area is the specified transmitter PCA for each transmitter station.

5 Weather Products and Information

Information broadcast to the public is selected and prioritized based on the weather needs of the people in the service area, and in accordance with the guidelines established in NWSI 10-1710, *NOAA Weather Radio (NWR) Dissemination*, and other applicable instructions.

5.1 Severe Weather Conditions

During severe weather, NWS personnel will, as required, interrupt the routine weather broadcasts and substitute warning messages or initiate live broadcasts. NWS personnel may also activate SAME coding within the PCA.

5.2 Non-Weather Related Emergency and Hazard Warnings

Messages concerning non-weather related emergencies and "all-hazards" type public warnings will be provided by authorized local, state, and federal officials to NWS for dissemination. These messages and the means for their dissemination will comply with NWSI 10-1710, *NOAA Weather Radio Dissemination*, NWSI 10-1712, *Specific Area Message Encoding*, and NWSI 10-518, *National Non-Weather Related Emergency Products Specification*.

6 Access to NWR Broadcast

The NWR broadcast is available free of charge and can be received with any device capable of receiving one of the NWR radio frequencies. Activation of the device or any alerts from the device from the NWR broadcast depends on the strength of the signal at the location of the device. The NWS is not responsible for any devices used to trigger a warning from the NWR broadcast signal.

7 NWR Maintenance

7.1 Authority

The WSH Dissemination Systems Team (DST) performs a staff function within WSH, acting with authority delegated from the AA for Weather Services. It provides direction, assistance, resources, and other support to the regions as addressed in NDS 30-21, *System Maintenance*. WSH and Regional Headquarters manage the NWR maintenance program.

7.2 Transmitters

NWR transmitters are serviced under one of four types of maintenance support: the NMC, a state/local maintenance contract, by government personnel, or privately maintained through the cooperator.

1. The NMC is available for routine, corrective, and emergency maintenance services on NWR transmitters contracted by the NWS. NWR transmitters maintained by the NMC are specifically identified in the maintenance contract.
2. NWR transmitters, not under the NMC, are the responsibility of the local Weather Forecast Office with support, as required, from Regional Maintenance Specialists.
3. NWS regions unable to maintain some of their NWR transmitters through the NMC may contract with a local or regional entity to perform required maintenance on those transmitters, with the approval of DST. Where cost effective, transmitters should be maintained through the NMC or by Regional Maintenance Specialists to reduce the overall cost of maintenance on the NWR system.
4. Maintenance activities for transmitters owned by private interest groups (not considered under the previous three maintenance types) are the responsibility of the private interest group.

8 Cooperators

Cooperators such as local community organizations, state, city, or county government(s), private companies, etc., are encouraged to sponsor and fund the installation, operation and maintenance of new NWR stations. If funds are required to set up and maintain the private NWR station and

are provided by a Cooperator, the NWS will assist in the analysis necessary for the siting and licensing of the NWR transmitter. Information on establishing a private NWR station is available from the DST NWR Program Manager or the Regional Director at any of the NWS Regional Headquarters. A Broadcast Service Agreement will be established between the NWS and the Cooperator. Should a Cooperator wish to donate a transmitter to the NWS, formal acceptance of a donated transmitter is achieved in several different ways, depending on the type of transmitter purchase. The NWR Program Manager will advise and assist in identifying the proper processes and forms to assist the Cooperator.

9 Agreements for Access to NWR Audio Output

Private and public TV and radio stations and other organizations can have access to the signal delivered by NWR. Such an arrangement is mutually beneficial and is encouraged. The station gets a high quality signal, and the NWS has a means of disseminating broadcast material even when the normal communications links and/or transmitter is out of service. Regional Headquarters have the authority to approve and execute agreements allowing users to obtain access to NWR audio output. There are two methods for a private party to obtain access to NWR audio output. One method is a line tap, in which a device is connected to the NWR BMH output at the originating NWS office. The other method is a bridge tap, in which the telephone line from the BMH output to the transmitter is tapped at the telephone company office. Templates for both of these types of agreements are maintained by WSH and are available from the NWR Program Manager. Copies of signed agreements will be kept on file at the Regional Headquarters and appropriate WFOs, with a copy being forwarded to the WSH DST Staff.

10 Notice of Station Outage

There are two types of outages: planned and unplanned.

10.1 Planned Outages

For planned Broadcast Outages and Suspension of Broadcasts, public notification procedures and rules for broadcast suspension due to radio interference are described in NWSI 10-1710, *NOAA Weather Radio (NWR) Dissemination*, Section 7.

10.2 Unplanned Outages

When NWR equipment is taken off the air for reasons other than planned maintenance or an unplanned outage occurs, weather and non-weather related emergency information will be available to television and radio media via NOAA Weather Wire Service (NWWS) and on NWS websites.

10.3 Internal NWS Notifications

There are two types of notifications to be reported internally.

10.3.1 Outages

All outages will be reported to the Regional Headquarters and DST NWR Program staff, as quickly as time will allow. All unplanned outages will be submitted using the Unscheduled Outage System (USOS), reporting critical outages as spelled out in NWSI 30-2112, *Reporting Systems Equipment and Communications Outages*.

10.3.2 Broadcast Suspension

All broadcast suspensions will be reported to Regional Headquarters and DST NWR Program staff, as soon as possible as described in NWSI 10-1710, *NOAA Weather Radio (NWR) Dissemination*, Section 7.

11 NOAA's Weather Radio All Hazards Logo

The NOAA Weather Radio All Hazards logo is a graphic with the words “All Hazards” printed above the acronym “NOAA”. Centered below the acronym “NOAA” is the product name, “Weather Radio”. Centered below the product name, “Weather Radio”, is the agency name, “NOAA’s National Weather Service”. Detailed information on the logo, its significance, and conditions and restrictions on its use can be found at the website:

http://www.nws.noaa.gov/nwr/info/allhazard_logo_info.html.

APPENDIX A - National Policy for the Use of Telecommunications to Warn the General Public

This Appendix includes the most recent affirmation (dated 06/11/02) by FEMA on the use of NWR as an all-hazard warning system and the original National Policy statement (dated 01/13/75) which establishes NWR as the only federally-sponsored radio transmission of warning information to the general public.



Federal Emergency Management Agency

Washington, D.C. 20472

June 11, 2002

John J. Kelly, Jr.
Director
National Weather Service
National Oceanographic and Atmospheric
Administration
1325 East-West Highway
Silver Spring, MD 20910

Dear Mr. Kelly:

I am writing to express my support for using National Oceanographic and Atmospheric Administration (NOAA) weather radio for civil emergency messages involving all hazards, not just weather-related ones. Through NOAA weather radio, we have a capability in place that can help save lives. We owe it to the public, as stewards of public safety and of tax dollars, to make maximum use of that capability.

In fact, this Agency already relies on the National Weather Service (NWS) for all-hazard warning to the public. Under Emergency Support Function #2 of the Federal Response Plan, a responsibility of NWS is to "Provide public dissemination of critical pre- and post-event information over the all-hazards National Oceanographic and Atmospheric Administration Weather Radio (NWR) system, the NOAA Weather Wire Service, and the Emergency Managers' Weather Information Network (EMWIN)." This is part and parcel of authority granted to the President under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, and delegated to the Director of the Federal Emergency Management Agency (FEMA), to "utilize ... any other Federal communications system for the purpose of providing warning to governmental authorities and the civilian population in areas endangered by disasters" (42 USC 5132 (c)). Under Title VI of the same Act, it is within the FEMA Director's authority to "make appropriate provision for necessary emergency preparedness communications and for dissemination of warnings to the civilian population of a hazard." (42 USC 5196(d)).

I believe use of NOAA weather radio for all-hazard warning to the public is consistent with the Federal Response Plan, the FEMA warning-related authorities I have cited, and good government. As a coordinator of Federal preparedness and response efforts, I support your initiatives to ensure NOAA weather radio is an all-hazard warning system, and I will gladly work with you to integrate your initiatives into our overall preparedness and response program.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe M. Allbaugh".

Joe M. Allbaugh
Director