



Nebraska Public Power District

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February 21, 2013

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Subject: Response to NRC Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3 (TAC No ME7951)
Cooper Nuclear Station, Docket No. 50-298, DPR-46

- References:**
1. NRC letter to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident*, dated March 12, 2012
 2. NPPD Letter to NRC (NLS2012034), *Nebraska Public Power District's 60-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*, dated May 9, 2012
 3. NPPD Letter to NRC (NLS2012048), *Nebraska Public Power District's 90-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*, dated June 7, 2012
 4. NPPD Letter to NRC (NLS2012112), *Nebraska Public Power District's Response to the March 12, 2012, Information Request Pursuant to 10 CFR 50.54(f) Regarding Recommendation 9.3 for Completing Emergency Communication Assessments*, dated October 31, 2012
 5. NRC letter to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, *Follow-up Letter on Technical Issues For Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3 (TAC NO. ME7951)*, dated January 23, 2013

COOPER NUCLEAR STATION

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Dear Sir or Madam:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a letter (Reference 1) entitled, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident. Enclosure 5 of the letter contained specific requested actions and requested information associated with Recommendation 9.3 for Emergency Preparedness programs communications. In accordance with 10 CFR 50.54, "Conditions of licenses," paragraph (f), addressees were requested to submit a written response to the information requests within 90 days or provide a response within 60 days of the date of the letter and describe the alternative course of action that it proposes to take.

Nebraska Public Power District (NPPD) responded within 60 days (Reference 2) proposing to take the alternative course of action for communications described in Attachment 1 of Reference 2. NPPD implemented this alternate course of action with the submittal of Reference 3 (described interim/planned actions to enhance existing communications systems power supplies pending the communications assessment and completion of actions) and Reference 4 (summarized the results of the communications assessment and the potential enhancements).

The purpose of this letter is to respond to Reference 5, the NRC follow-up letter regarding technical issues to be resolved with Reference 4. Responses to the eight technical issues in Reference 5 are provided in Attachment 1. The communications assessment, originally provided in Reference 4, has been revised to reflect the responses in Attachment 1 and is found in Attachment 2. These responses are subject to change as a result of Diverse and Flexible Coping Strategies developments, advances in technology, and progress in the manner of addressing the need for these enhancements.

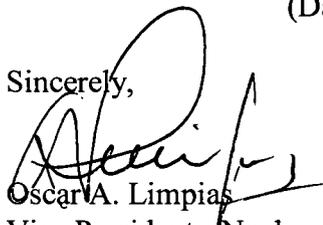
There are no new commitments identified in this submittal.

If you have any questions concerning the content of this letter, please contact David Van Der Kamp, Licensing Manager, at (402) 825-2904.

I declare under penalty of perjury that the foregoing is true and correct.

Executed On 02/21/13
(Date)

Sincerely,



Oscar A. Limpas
Vice President - Nuclear and
Chief Nuclear Officer

/bk

- Attachments:
1. Cooper Nuclear Station Communications Assessment - Addressing Eight Technical Issues
 2. Cooper Nuclear Station Communications Assessment, Revision 1

cc: Regional Administrator, w/attachments
USNRC - Region IV

Director, w/attachments
USNRC - Office of Nuclear Reactor Regulation

Cooper Project Manager, w/attachments
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector, w/attachments
USNRC - CNS

CNS Records, w/attachments

NPG Distribution, w/o attachments

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ATTACHMENT 1

**COOPER NUCLEAR STATION
COMMUNICATIONS ASSESSMENT -
ADDRESSING EIGHT TECHNICAL ISSUES**

Attachment 1
Cooper Nuclear Station Communications Assessment -
Addressing Eight Technical Issues

The Nuclear Regulatory Commission's (NRC) eight generic technical issues regarding licensee's Communications Assessment submittals are shown in italics below. Nebraska Public Power District's (NPPD) responses are shown in block font. As a result of the responses to the technical issues, NPPD has revised the Cooper Nuclear Station (CNS) Communications Assessment, including providing a projected completion schedule for the enhancements identified in Table 11 of the Communications Assessment.

Generic Technical Issue 1:

The staff identified that licensees need to discuss how the power for the equipment analyzed is expected to be available, and how the planned communications enhancements are expected to be maintained. The following areas were identified:

- A. A detailed description of how power will be maintained for (1) planned or potential enhancements to the communication links and (2) existing equipment analyzed to be available.*
- 1. The number of replacement batteries expected to be needed for a 24-hour duration, per the Nuclear Energy Institute (NEI) 12-01 "Guideline for Assessing Beyond Design Basis [sic] Accident Response Staffing and Communications Capabilities".*
 - 2. Generator availability to charge batteries without offsite equipment for a duration of 24 hours.*
 - 3. A description of how ancillary equipment supports operations for a 24-hour duration (e.g., adequacy of fuel supplies for the generators; and the minimum number of battery chargers expected to be necessary).*

NPPD Response:

Only two means to establish communications links were initially credited by NPPD in the CNS Communications Assessment; handheld radios (on-site communications) and satellite phones (off-site communications). Subsequently, NPPD credited the plant Public Address/Paging system (Gaitronics) for use in making initial alert and notification of on-site personnel. This system is limited to four hours without taking manual actions.

NPPD chose to ensure power to the credited portable communications links (handheld radios and satellite phones) is maintained by purchasing sufficient quantities of batteries to power these devices for 24 hours without any required charging. NPPD does not intend to utilize a generator for the first 24 hours. Details are provided below:

Satellite phones:

Three charged batteries are assigned to each satellite phone. These batteries are stored either in the phones (one each) or in chargers (two each) in the emergency response facility (ERF) inventories. Satellite phones are operationally tested quarterly and their batteries swapped into/out of a charger-conditioner. Procedural guidance was developed to ensure programmatic maintenance is performed.

A satellite phone with its associated three batteries will provide approximately 36 hours of communications (assumes 25% duty cycle and three hours of transmit battery life per battery; the minimum manufacturer's claim).

Handheld Radios:

In accordance with Federal Communications Commission requirements, new handheld radios (digital, narrow-band Motorola model XTS 2500) were purchased and deployed since the submittal of CNS' initial Communications Assessment. Credited handheld radios (26) are stored in charger-conditioners, thus their batteries will be fully charged at the onset of any emergency, including the assumed Local Severe External Event (LSEE).

New battery components and better charger-conditioners have minimized the impact of battery 'memory' or over-charging of batteries. Battery capacity is now almost entirely dependent upon duty cycle (i.e., the amount of transmit time versus receive/standby time). One typical duty cycle used for rating battery capacity is 5/5/90; that is 5% transmit, 5% receive with audio, and 90% standby (receive without audio). CNS handheld radios are equipped with Impress Ni-MH FM batteries, model NTN9857. The manufacturer specifies these batteries as 2000 mAh and (assuming a 5/5/90 duty cycle) rates them to last 10 hours. Anecdotal evidence from CNS' Security force indicates that these batteries will last an entire 12 hour shift.

When the installed battery of a radio is depleted, and if another radio with a charged battery is not available, additional power to these radios is provided via dry cell battery adapters and dry cell batteries. One adapter for each credited radio was added to the Control Room and Technical Support Center/Operational Support Center (TSC/OSC) inventories, together with the minimum number of dry cell batteries with which they are to be loaded. Actual use (as well as known mAh capacity [4900 mAh] of these packs) has shown that these adapter packs provide over twice the capacity of the rechargeable Ni-MH FM batteries.

These dry cell battery adapters and batteries were added to the quarterly emergency inventory of the Control Room and TSC/OSC (Procedure 5.7.21,

Maintaining Emergency Preparedness - Emergency Exercises, Drills, Tests, and Evaluations).

One rechargeable (installed) battery for each radio (10 hours), plus one dry cell adapter each (approximately 20 hours), at a duty cycle of 5/5/90, equals approximately 30 hours of overall battery capacity. Per Nuclear Energy Institute (NEI) 12-01, after 24 hours it may be assumed that offsite sources of batteries are available. Therefore, the combination of installed rechargeable batteries and subsequent use of dry cell battery adapter packs and available dry cell batteries is assumed to provide power to handheld radios for an indefinite period of time.

Generic Technical Issue 2:

The use and function of the planned enhancements for the improvement of communications.

A. A description of the use of the planned enhancements.

- 1. A discussion of whether each planned enhancement identified is only to be used for maintaining the communication link identified, or if it is expected to be shared among other communication links.*
- 2. A general description of the planned enhancement and how the equipment will be integrated.*
- 3. The title and general description of the procedure that will be developed and used by plant personnel to describe protocols for shared usage of communication capabilities.*

NPPD Response:

NPPD did not credit any shared communications resources. Each identified communications link is supplied by its own satellite phone or radio, with sufficient battery power (assuming a certain duty cycle) for a minimum of 24 hours. NPPD will not be implementing shared usage; therefore, a procedure is not required.

Generic Technical Issue 3:

The protection of the new equipment purchased as a planned enhancement as well as the protection of existing communications equipment analyzed as being available.

- A. A discussion of how the existing equipment analyzed to be available and enhancements to these communication links as well as associated ancillary equipment will be stored in a manner that is protective from a large scale natural event.*

- 1. A description of pre-identified areas that are considered protective for existing equipment and whether new equipment will be stored in a similar location. The title and brief description of a procedure for new communications equipment storage is acceptable, if this procedure is planned to be developed in the future; or a statement that this will be completed in alignment with NRC order EA-12-049.*
- 2. Equipment stored offsite, should have an analysis of duration to set-up this equipment for use.*
- 3. The analysis demonstrates that the existing equipment that is expected to be available will be functional.*

NPPD Response:

Credited portable communications equipment (satellite phones and handheld radios) is located in areas deemed protected from both seismic and flooding. Radios are stored in two locations. The first location is the Alternate Shutdown cabinet adjacent to the Control Room on elevation 932' of the Control Building. This building is a seismic Class I structure. The second location is the TSC/OSC. This combined facility is located within the Administration Building on elevation 903'6". One wall of the TSC/OSC is a shared exterior wall of the Reactor Building (seismic Class I). The remaining walls are substantial, poured high-density concrete designed to provide radiological shielding for the TSC/OSC, and therefore provide a seismically robust structure. The elevation is above the site design basis flood level.

Credited radios are stored in charger-conditioners. These are located on cabinet shelves or on countertops, but are not secured. This equipment is lightweight but is not expected to experience interactions with or from adjacent materials. These radios meet the applicable Military Specifications 810, C, D, E, and F. Therefore, these radios are not expected to receive damage even if they did fall off the shelves or countertops.

Credited satellite phones are stored in Pelican™ protective cases in several locations; the Control Room, TSC/OSC, Emergency Operations Facility (EOF) (offsite), and Joint Information Center (JIC) (offsite). The Control Room and TSC/OSC are as described above; therefore, the equipment is protected from seismic and flooding. The EOF and JIC are located approximately 11 miles from the site in Auburn, Nebraska. The satellite phones and batteries/chargers for these facilities are located in a steel cabinet. The building housing the EOF/JIC is cement block, is not near any bodies of water, and therefore is judged to protect the equipment from seismic and flooding.

Credited radios and satellite phones are inventoried and tested periodically. This has been incorporated into Procedure 5.7.21 (Maintaining Emergency Preparedness - Emergency Exercises, Drills, Tests, and Evaluations), and Emergency Preparedness Department Guide (EPDG) #2 (Quarterly Satellite Phone Test and Battery Swap and Monthly Testing 2-Way Radios).

Any additional batteries purchased as enhancements for radio repeaters will be installed adjacent to the existing batteries and therefore will have the same protection as discussed in Sections 4.13.1 through 4.13.5 of the assessment report.

No equipment to be used on-site is to be stored off-site.

Generic Technical Issue 4:

The programmatic controls for the use of the new equipment purchased as a planned enhancement.

- A. A description of planned proceduralization and training for the use of these planned enhancements. It is acceptable to provide the title and description of a new procedure for communications equipment.*
- 1. A description of any credited manual actions and their procedures.*
 - 2. A description of any maintenance for this equipment, including operability testing.*
 - 3. A description of periodic inventory checks.*
 - 4. A description of planned staff training.*

NPPD Response:

No additional training is planned for the use of handheld radios or satellite phones. Operations, Maintenance, Radiological Protection, Chemistry, and Security personnel are familiar with the operation of handheld radios. Non-Security personnel on-shift are typically on the Emergency Response Organization (ERO) and perform in periodic drills or exercises where radios are used for communications. Security personnel use identical radios daily. Although the radio model has changed, the operation has not. Satellite phone operation is identical to the operation of a standard cellular phone. Instructions are included in the storage cases. Emergency response telephone numbers are pre-programmed into satellite phones.

Instructions on the use of emergency communications systems are contained in Procedure 5.7COMMUN (Communications). This procedure is required reading, per Training Procedure TPP-101, for all ERO positions (except JIC positions), for both initial and re-qualification training.

No manual action is required for the long-term use of these communications devices with the exception of swapping batteries. Illustrated instructions for loading the radio dry cell battery adapters with batteries are stored with the adapters/dry cell batteries.

Procedure 5.7.21 (Maintaining Emergency Preparedness - Emergency Exercises, Drills, Tests, and Evaluations) describes the inventory of this equipment. EPDG #2 (Quarterly

Satellite Phone Test and Battery Swap and Monthly Testing 2-Way Radios) establishes detailed guidance for periodically testing the radios and satellite phones and swapping out their batteries.

Generic Technical Issue 5:

A discussion on what assumptions are used as part of the Communications Assessment.

- A. A description of the assumptions used for the submitted Communications Assessment Summary, and technical justification for any differences from the assumptions within NEI 12-01, Sections 2.2 "Assumptions Common to Both Assessments" and 2.4 "Assumptions For Communications Assessments".*

NPPD Response:

NPPD took no exceptions to the assumptions of NEI 12-01. Initially, NPPD assumed that no installed communications equipment remained operable.

Although limited site access was allowed to be assumed per NEI 12-01 after six hours, NPPD also did not rely upon this assumption. Credited portable communications links have been enhanced to provide for 24 hour capability without manual operator actions (except battery swap) and without any off-site resources. No AC power source (normal, backup, or emergency) is depended upon.

After determining that an exhaustive sweep of the CNS Protected Area was not feasible within 30 minutes, NPPD re-assessed the survivability of the installed plant Public Address/Paging system (Gaitronics). This assessment concluded that there is justification for believing that this system would both survive a severe event and remain operable for an adequate time period to perform its communications function.

This system is powered from the No Break Power Panel (a non-AC source), its critical components are housed in seismic Class I structures, above the design basis flood levels, with no manual actions required for operation under LSEE/Extended Loss of AC Power conditions. Therefore, crediting this system does not take exception to the assumptions of NEI 12-01.

Generic Technical Issue 6:

How plant personnel will be notified in the event of a large scale natural event that causes a loss of all AC power.

- A. A description and title of the procedure for emergency notification of essentially all plant staff within 30 minutes [if applicable to the licensee Emergency Plan].*

- B. A description and title of procedure for notification of emergency response organization staff (i.e., self activation) [if applicable].*

NPPD Response:

The normal means for alerting and notifying on-site personnel of a declared emergency is to sound an alarm and make an announcement using the plant Public Address/Paging system (Gaitronics). In the initial Communications Assessment this system was not credited as being operable. NPPD re-assessed the survivability of this system. This system is not powered from AC sources, its critical components are housed in seismic Class I structures, above the design basis flood levels, with no manual actions required for operation. Therefore, this system is now credited for alert and notification of on-site personnel.

If it is determined portions of this paging system are impaired, alternate methods for alerting and notifying on-site personnel are proceduralized in Procedure 5.7.10 (Personnel Assembly and Accountability) and Security Procedure 3.14 (Non-Security Emergencies).

NPPD has instructed off-site ERO personnel that upon becoming aware of a large-scale localized event (which presumably would result in a declaration of an emergency and activation of the ERO) combined with a lack of notification and inability to contact the site to automatically report to their assigned ERFs once assuring the safety of their families. Procedure 0-EP-01 (Emergency Response Organization Responsibilities) was revised to include this direction. Training Program Procedure TPP-101 was revised to require ERO personnel to review this procedure as a part of their initial ERO and annual re-qualification training.

In addition, this procedure informs the ERO that if conditions are such that the site cannot be accessed, two staging areas have been designated, one on each side of the Missouri River to which personnel may report. Arrangement for logistical support (transport and helicopter landing areas) of ERO personnel from these staging areas to the site is captured by Letters of Agreement.

Generic Technical Issue 7:

How communications will be maintained during the period of final implementation of the communications enhancements:

- A. Identification and description of the interim actions that will be in place to bridge the gap until all final mitigation strategies being proceduralized are implemented. This also includes equipment protection.*

NPPD Response:

With the completion of enhancements related to providing 24 hour battery power to handheld radios and satellite phones, and fully incorporating programmatic support of these devices into plant procedures, NPPD has assured that all required communications links can be maintained under LSEE/Station Blackout conditions. Physical changes related to these on-site enhancements were completed in 2012. Associated implementing procedure changes were approved and in place in February 2013.

These communications links will initially be limited. Satellite phones will only work outdoors, and handheld radios may not be fully supported by high-power repeaters. Relaying of messages may be necessary.

Enhancements were identified to evaluate options and select method(s) to support indoor (remote) access to satellite-based communications and evaluate and assure that batteries supporting a minimum of two installed radio systems (repeaters) are sized to provide adequate (24 hours) capacity. The full implementation of these enhancements will facilitate satellite communications indoors (Control Room, TSC/OSC, EOF and Offsite Response Organizations) and provide long-term (24 hour minimum) power to a minimum of two radio repeater(s).

Generic Technical Issue 8:

Descriptions are needed regarding how communications will be maintained with the on-site and in-plant response teams and offsite response organizations if their communication links are not expected to be available.

- A. A timeline for when the evaluation for site specific improvements for on-site and in-plant response teams will be completed.*
- B. A discussion of the enhancements that are planned for the offsite response organization communication links.*

NPPD Response:

The minimum numbers of communications links to on-site and in-plant teams will be continuously maintained using handheld radios. As discussed in the response to Technical Issue 1, NPPD has provided power to these portable radios for greater than 24 hours with no manual actions required, except changing batteries.

The minimum numbers of communications links to offsite response organizations will be maintained using satellite phones. NPPD has two State (Nebraska and Missouri) and three County (Nemaha, Richardson, and Atchison) contact points to 'local' offsite response organizations (ORO). Per the assumptions of NEI 12-01, communications infrastructure outside a 25 mile radius may be assumed to remain intact. Both State

contact points are beyond this 25 mile radius therefore NPPD assumes that contact, via satellite phone on our end only, remains a viable means of contacting these two OROs. The same assumption is applied to all other agencies outside this 25 mile radius (e.g., NRC [Headquarters and Region], United States Geological Survey, Army Corps of Engineers, NEI, and Institute of Nuclear Power Operations).

An enhancement in the CNS Communications Assessment was identified to ensure that all primary OROs have satellite communications capabilities. Three extra satellite phones (beyond the required 13 identified links in the Communications Assessment) have been purchased and will be assigned to OROs within the 25 mile radius.

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ATTACHMENT 2

**COOPER NUCLEAR STATION
COMMUNICATIONS ASSESSMENT**

REVISION 1

1. Executive Summary

The purpose of this report is to document the performance of a Nuclear Regulatory Commission (NRC) requested assessment of the current communications systems and equipment used at the Cooper Nuclear Station (CNS) site during an emergency event as defined by Nuclear Energy Institute (NEI) 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities." Power supplies for the existing communications equipment credited have been assessed to determine power availability during a prolonged Station Blackout (SBO) event.

The beyond design basis events assumed in this assessment introduce conditions that could render a significant portion of existing installed site communications capabilities inoperable. The assessment identifies proposed enhancements to maintain the minimum communications capabilities for responding to emergency events, as well as enhancements to improve the survivability of currently installed communications systems (see Table 11). These enhancements include:

- Addition of extra batteries and chargers in support of extended use of handheld satellite phones
- Addition of dry-cell type battery packs in support of extended use of portable radios (walkie-talkies)
- Evaluation of options to support indoor (remote) access to satellite-based communications
- Correction of identified issues related to potential seismic interaction concerns
- Evaluation and probable enhancement of battery-based power to critical communications systems

2. Methodology

This report is based on the recommended criteria from NEI 12-01, for use in identifying enhancements that will ensure the availability of critical communications capabilities during an extended loss of AC power, including evaluation of power sources for communications equipment. This approach provided the flexibility to accommodate specific site needs while, at the same time, ensuring consistency with industry-developed standards, and NRC regulations and guidance.

The assessment focused first on the communication systems to be credited. These required communication links were assumed to be established via satellite phones (offsite) and the use of the existing site handheld radios (onsite). Existing installed communications were initially assumed to be inoperable and therefore were not credited in this assessment. However, walkdowns to evaluate both portable and installed equipment, locations, and function were performed. Subsequent to the 2012 submission of the CNS Communications Assessment, Nebraska Public Power (NPPD) performed an evaluation of the installed plant Public Address/Page system (Gaitronics). The evaluation concluded that the Gaitronics system is adequately protected from seismic and flooding hazards, and is powered from the No Break Power Panel (a non-AC based source). Therefore, NPPD now credits this

communications system for initial alerting and notification of onsite personnel. This system's primary (DC) power supply will not (unless augmented) last beyond four hours. However, alerting and notifying onsite personnel will take place at the beginning of an emergency; therefore, this capacity is deemed adequate to perform the function. See Section 4.2.

Enhancements identified from the assessment will be further developed as implementation progresses. Alternate approaches will be utilized if prudent (e.g., alternate/new technology, improved capability, cost savings, etc.).

3. Assumptions (Derived from NEI 12-01)

- Extended loss of AC power event
- Successful plant shutdown
- No hostile action
- 6 hours post event – no site access
- 6 - 24 hours post event – limited site access
- 24+ hours post event – access restored to near normal status
- Installed sources of AC power not available
- Non-essential loads from DC battery sources are stripped per station procedures
- Installed inverters and battery chargers remain available provided they are protected from external events
- Onsite diesel fuel oil is available provided it is stored in a protected manner from external events
- Portable equipment may be used provided it is stored onsite and protected from seismic, wind, and flooding events. Includes portable AC and DC power sources
- Onsite communications infrastructure remains available provided it is protected from seismic, wind, and flooding events
- Offsite communications infrastructure is inoperable out to 25 miles
- Communications equipment located at an offsite response facility and supplied from a backup power source is assumed to be functional

4. Communications During an Extended Loss of AC Power

NEI 12-01 Section 4, "Communications During an Extended Loss of AC Power" provides the basis for the following assessment.

4.1 Required Emergency Communication Capabilities (NEI 12-01 Section 4.1)

NPPD has reviewed the minimum required communications links and has determined the method of communications (i.e., radio or satellite phone) to be credited for each defined link and the overall number of satellite phones and radios needed (see Table 10). NPPD determined that some additional satellite phones or radios may be required, at the Offsite Response Organization (ORO) end, to establish the required links with OROs. Area for enhancement (see Table 11, item #3).

NPPD recognizes that portable satellite telephones do not work indoors. Their antennas must have a clear direct view of the sky. Therefore, portable satellite phones have to be taken outdoors to establish the required communications link(s). This is not considered adequate for the long term.

These same communications links must be established from within the boundaries of areas within the plant which are very difficult to modify. Making penetrations to route antenna coaxial cable may require design changes, habitability considerations, regulatory reviews, and the revision of supporting documentation. NPPD will evaluate options and select method(s) to support indoor (remote) access to satellite-based communications. Area for enhancement (see Table 11, item #4).

4.2 Plant Paging (Announcement) System (NEI 12-01 Section 4.2)

NEI 12-01 Section 4.2 requires notification of the plant staff at the onset of the event. The CNS plant paging system provides public address capability over a large portion of the site. The system was not initially credited as available for notification of plant personnel. Alternative measures now used for inoperable paging coverage areas were assessed for use site-wide. Area for enhancement (see Table 11, item #6).

The assessment directed by the enhancement determined that alternate measures used for alerting and notifying limited areas of inoperable Public Address/Page system (Gaitronics) are not feasible for the entire Protected Area. Therefore, NPPD performed a more detailed evaluation of the installed Gaitronics system. The evaluation concluded that the Gaitronics system is adequately protected from seismic and flooding hazards, and will have adequate non-AC based power to perform the communications task of alerting and notifying onsite personnel of an emergency. NPPD now credits this communications system for that task only. This system's primary (DC) power supply (unless augmented) may not last beyond four hours. The four hour capacity is deemed adequate to perform the alert and notification function. NEI 12-01, Section 4.1.2.1, requires only that this system be powered from a battery-backed source. Once initial directions have been communicated to onsite personnel, NEI 12-01 allows this communications system to be removed from service to extend critical battery capacity.

4.3 Communications Equipment at ORO Facilities (NEI 12-01 Section 4.3)

Per NEI 12-01, "Some communications capability should be available at the ORO facilities that normally receive licensee notifications of an emergency declaration or a Protective Action Recommendation." NPPD assessed capabilities at their ORO facilities. All five ORO facilities (Nebraska State Patrol, Nemaha County Sheriff, Richardson County Sheriff, Missouri State Patrol, and Atchison County 911 Center) have backup power. Additional communication capabilities (i.e., satellite phones) are recommended at some of these facilities. Area for enhancement (see Table 11, item #3).

Per the assumptions of NEI 12-01, it may be assumed that communications infrastructure outside a 25 mile radius remains intact. Both State contact points are beyond this 25 mile radius; therefore, NPPD assumes that contact, via satellite phone on our end, remains a viable means of contacting these two OROs. NPPD will ensure that OROs within the 25 mile radius of the CNS have installed satellite phone capability. Area for enhancement (see Table 11, item #9).

4.4 Notification of the Emergency Response Organization (ERO) (NEI 12-01 Section 4.4)

NEI 12-01 offers two potential options to promote timely staff augmentation by the ERO. CNS will ensure that "ERO members are trained to automatically respond to their assigned facilities or a designated staging area when made aware of a wide area loss-of-grid (e.g., by direct observation, media reports, word-of-mouth, etc.)." This expectation has been established with the ERO. This expectation will also be included in annual ERO requalification training. Area for enhancement (see Table 11, item #7).

Instructions for ERO personnel to report to their Emergency Response Facility (or an alternate staging area) have been communicated. These instructions have also been incorporated into Procedure 0-EP-01, Emergency Response Organization Responsibilities. This procedure is required reading for all ERO positions for both initial and annual re-qualification training. All actions associated with this area for enhancement have been completed.

4.5 Equipment Location Requirements (NEI 12-01 Section 4.5)

Communication equipment to be used or considered operable, "...should be in a location and maintained in a manner that maximizes survivability following a beyond design basis external event. In particular, the location or manner should reasonably preclude wetting from flooding or impact damage from a seismic event." The communication links as defined by NEI 12-01 will be established using satellite phones and handheld radios. Assessments were performed, including walkdowns, of the existing installed radio equipment. Enhancements have been identified associated with installed equipment's support/mounting as well as potential impact from adjacent equipment and/or stored material. One issue associated with wetting from flooding was identified related to the Communications Tower enclosure. See Sections 4.13.2 for details. Area for enhancement (see Table 11, item #1).

All seismic interaction and housekeeping issues identified in the initial Communications Assessment have been corrected. NPPD continues to evaluate potential enhancements related to the location of installed communications equipment. All credited communications (satellite phones and handheld radios) are stored in locations which provide reasonable protection from seismic and flooding hazards.

4.6 Performance Characteristics (NEI 12-01 Section 4.6)

The performance characteristics as identified in this section of NEI 12-01 require that communication pathways (e.g., radio channels, satellite phones) designated to support multiple functions must be analyzed to demonstrate that they can simultaneously support both functions. NPPD assessed capabilities on a radio channel by channel and satellite phone device basis and did not identify any instances where a single communication pathway was assigned to support multiple functions. No further action is required.

4.7 Other Assessment Considerations (NEI 12-01 Section 4.7)

Enhancements (physical and programmatic) are recommended to ensure considerations, as identified in this section of NEI 12-01, are met. Provisions for portable backup power sources and batteries for battery operated equipment need to be established. Area for enhancement (see Table 11, item #5).

NPPD has provided the physical and programmatic means to power credited communications devices (satellite phones and handheld radios) for a minimum of 24 hours without the need for manual actions, except changing batteries. However, these devices are limited. Radios have poor coverage without repeaters, and portable satellite phones work only outdoors. Enhancements (Table 11, items #2, #4, and #9) will address these limitations. Upon full implementation of all enhancements, NPPD will have indoor satellite capability and expand the battery capacity of at least two installed radio repeaters to a minimum of 24 hours.

4.8 Quality and Maintenance-Related Requirements (NEI 12-01 Section 4.8)

The requirements identified in this section of NEI 12-01 need to be incorporated into the program for ensuring the credited equipment is maintained in a manner that maximizes survivability. Programmatic controls need to be established to ensure that equipment remains available and operable. This may include documenting inventories and adding preventive maintenance for periodic testing of the satellite phones and chargers. Area for enhancement (see Table 11, item #7).

Programmatic controls for the credited communications equipment were fully incorporated into plant procedures. As additional enhancements are completed, appropriate programmatic controls for those enhancements will be incorporated into processes and procedures.

4.9 National Communications System (NCS) Services (NEI 12-01 Section 4.9)

NPPD assessed the NCS services. NPPD recommends that additional Government Emergency Telecommunications Service (GETS) access cards be acquired for key CNS site positions or Emergency Response Facilities (ERFs). Area for enhancement (see Table 11, item #8).

Additional GETS cards were distributed and a process to inventory the cards to ensure that they work was implemented. This area for enhancement is complete.

4.10 Communication Provider Emergency Services (NEI 12-01 Section 4.10)

NPPD contacted the major communications service providers for CNS (Verizon and AT&T). Neither company has a separate emergency services priority other than government telecommunications service priority. No further action is recommended.

4.11 Personnel Training (NEI 12-01 Section 4.11)

The requirements identified in this section of NEI 12-01 are recommended to be incorporated into the CNS Emergency Planning program. NPPD will evaluate existing training to determine if the adequacy and periodicity of training is sufficient. Area for enhancement (see Table 11, item #7).

4.12 Emergency Plan (E-Plan) Identified Systems Overview and Assumptions

The following sections summarize the communications systems discussed in the CNS E-Plan.

The E-Plan Section 7.3 notes that communications may be provided by different means (telephone system, plant paging system, alternate intercom, FM radio, and sound power). For the purposes of this assessment, the communications capabilities in E-Plan Section 7.3 were assumed to be successfully met only if they were judged to be continuously available for 24 hours after the loss of onsite and offsite AC power. The majority of the installed emergency preparedness (EP) communication systems have been assumed (by this assessment) to have deficiencies which would prevent their survival in the beyond design basis external event.

However, the assumptions underlying this assessment were conservative. Although the assessment identified areas for enhancement, it also established that the communications systems at CNS are well designed, installed, and maintained. They are diverse both in their locations, their primary and backup power sources, and their supporting infrastructures. NPPD feels confident that by making the enhancements identified by this assessment, these same communications systems may be more likely to survive a beyond design basis event. See Sections 4.13.1 - 4.13.5 for details concerning proposed enhancements.

4.13 Equipment Locations and Capabilities

The communications function, radio reception/transmission equipment, and protection of each location from seismic, wind, and flooding are discussed below. Specifically, the capacity of the equipment in its current configuration was evaluated as to its ability to withstand the identified external hazards. These hazards include seismic, flooding, and high winds. The structural evaluation was

based on engineering judgment developed by a consensus of two engineers experienced in structural design and construction.

The maximum probable flood elevation is 903'. Because no EP communications equipment, except for the Communications Tower and equipment enclosure (refer to Section 4.13.2 for further explanation), exists below this elevation, most EP communications equipment is not at risk of flooding due to a design basis flooding event. See Section 4.13.2 for further information.

The sections below provide more detail of the area walkdowns and their potential configuration concerns that could present challenges to communications systems in the event one or more of the identified environmental hazards occur.

4.13.1 Elevated Release Point (ERP) Tower and Equipment

Location and General Description

EP communications equipment is located inside the ERP Tower communications enclosure. The ERP Tower is located inside the Protected Area (PA) southeast of the Reactor Building and is 325' tall. The communications enclosure is a pre-fabricated trailer-like structure constructed of a metal frame covered with fiberglass panels. This enclosure is attached to the ERP Tower structural steel members, at an elevation of approximately 920' mean sea level (MSL).

Equipment & Functionality

Radio System Base #1 Repeater is located in the ERP Tower communications enclosure. The radio system for Base #1 is comprised of a narrow-band UHF transceiver, connected to receive and transmit antennas mounted near the top of the ERP Tower. Base #1 radio provides repeater coverage to portable radios (walkie-talkies) and mobile units at the plant site and the Emergency Operations Facility (EOF), located in Auburn, Nebraska (approximately 11 miles to the west). This radio equipment is also hardwired to desksets and consoles at various locations at CNS and the EOF. A simplified block diagram shows interconnections for Radio System Base #1. See Figure 1.

Power

120V AC power to the Base #1 radio system is supplied from a lighting panel LP-ERP (Shack) Comm Box. This panel gets AC power from switchboard MSB located in the Machine Shop via step down transformer EE-XFMR-LPERP (Shack). Switchboard MSB gets its feed from non-essential 480V switchgear 1B via switchboard MSA.

This panel is also permanently wired to an outside emergency generator receptacle via transfer switch CC-SW-LPERP (Shack).

A battery charger for Base #1 is now integrated into the radio unit itself. There is a bank of batteries to power the radio in the event of loss of AC power. The backup battery

bank will be evaluated to assure that it provides adequate (24 hour) power. Area for enhancement (see Table 11, item #2).

Structural Assessment

The ERP Tower communications enclosure, attached to the ERP Tower at approximately 920' elevation, provides reasonable assurance that the EP communications equipment is protected during a flooding event, as defined in NEI 12-01.

The communications enclosure has been designed (per the manufacturer) to withstand 3 second bursts of 100 mph wind. The ERP Tower itself is described by the Updated Safety Analysis Report (USAR) as being designed in accordance with Class 1 seismic loadings and includes a dynamic analysis. This does not include tornadic winds as this structure is not required for safe shutdown. Therefore, the ERP Tower and communications enclosure itself (notwithstanding the communications rack itself) provides reasonable assurance that the EP communications equipment is protected during a seismic or wind event, as defined in NEI 12-01.

Communication Equipment and Racks

Seismic Protection - Enhancement identified. See Table 11, item #1.

- Anchorages
 - The rack that supports the Radio Repeater (Base #1) is anchored to the floor but is unsupported at the free (upper) end. The free end of this rack may require a brace. An additional evaluation is required.
 - Some electrical equipment is missing hardware that fastens it to the rack. For example, the two batteries located on the bottom shelf of the Radio Repeater rack are not attached to the shelf.
- Spatial Interactions
 - Adjacent to the rack is an unanchored box fan and an unanchored metal stand. These items should be removed or anchored.
- Housekeeping
 - There are several miscellaneous items in the room that should be removed.
 - The entire room needs to be cleaned up. Box fans and unused chairs should be removed.

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

Antennas

Seismic Protection - ACCEPTABLE

- Anchorages
 - No concerns
- Spatial Interactions
 - No concerns
- Housekeeping
 - No concerns

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

4.13.2 Communications Tower

Following submittal of the initial Communications Assessment, NPPD installed and commissioned a new Meteorological (MET) tower. The old MET tower was re-designated as the Communications Tower. The Communications Tower, and its enclosure, continue to house and support all the same communications systems, although the narrow-banding modification made changes to the specific equipment itself. All meteorological equipment was removed from the Communications Tower following final acceptance of the new MET tower.

Location and General Description

EP communications equipment is located outside the PA in an enclosure adjacent to the Communications Tower. This enclosure is a pre-fabricated trailer-like structure constructed of a metal frame covered by fiberglass panels that rests on an at-grade concrete slab. The Communications Tower is a 100-meter commercial radio tower. The tower is heavily guyed with substantial guy anchors and the tower base is anchored to the concrete slab.

Equipment & Functionality

Radio System Base #2 repeater is located in the Communications Tower equipment enclosure. The Radio System Base #2 is comprised of a UHF transceiver and is connected to a directional antenna mounted at 50' on the tower. The Base #2 directional antenna is pointed toward the power block. Base #2 is intended to be the primary repeater for coverage using portable radios (walkie-talkies) and mobile units at the plant site. Control points for Base #2 are located at various locations at CNS and the EOF. A simplified block diagram shows interconnections for Radio System Base #2. See Figure 2.

A Low-Band (VHF) radio system transceiver is located in the Communications Tower and equipment enclosure. The Low-Band antenna is installed near the top of the Communications Tower.

Low-Band control points are located at various locations at CNS and the EOF in Auburn, Nebraska. A simplified block diagram shows interconnections for Radio System (Low-Band). See Figure 3.

Power

120V AC power to the radio system equipment is supplied from a local power panel MI-PNL-100M. Panel MI-PNL-100M gets primary power from 480V AC switchboard EE-SWBD-NLDC via step-down transformer MI-XFMR-100M. Alternate power is supplied from critical bus MCC-L via an ASCO 7000 transfer switch MI-SW-100M (Trans).

There is a 48VDC charger with backup batteries installed in the Communications Tower equipment enclosure. It supplies 48VDC to the DC bus and charges the backup batteries. The charger provides power to the Base #2 repeater, a Hot-Standby Siren repeater, and a 48VDC to 12VDC converter. The 48VDC to 12VDC converter provides power to the Low-Band Radio. Battery life will be evaluated to ensure adequate capacity. Area for enhancement (see Table 11, item #2).

Structural Assessment

The Communications Tower equipment enclosure is similar to the ERP Tower communications enclosure, and is bolted to a supporting concrete slab a few feet from the Communications Tower. The tower and enclosure are located on the non-river side of the Missouri River protective dike at an elevation higher than the surrounding ground, but lower than the nominal top of levee elevation of 902'. Therefore, if the protective dike was breached, and the surrounding area flooded to a level of several feet, there is a potential for the enclosure to be flooded.

CNS experienced near-design flooding in 2011, and previously in 1993. In both cases the protective levee north of the plant failed on the Missouri side, and caused flooding into the 4-5 mile wide River basin.

The Communications Tower (and enclosure) is one of the locations/equipment listed in CNS Emergency Procedure 5.1 FLOOD to consider when protecting the site from the effects of flooding. In 2011, the Communications Tower was sandbagged. A portable gas-powered pump was staged on the inside of the sandbagged area to facilitate pumping out any in-leakage or precipitation accumulation. It was not needed.

River level increases gradually and predictably if due to precipitation. The USAR describes the most critical acute flooding event to be the failure of a major flood control dam; either the Oahe or Fort Randall dam. The closer of the two is almost 350 miles upstream from the CNS site. The waters released by failure of this dam would require at least three days to reach the CNS site. This would be ample time for protective measures to be taken to protect this equipment.

Because this equipment is located below the protective levee height, it is therefore assessed as 'questionable' that the EP communications equipment within the enclosure is protected during a severe flooding event, as defined in NEI 12-01.

The Communications Tower is designed for 90 mph wind with no ice buildup on the structure, or a 40 mph wind with ¾" ice buildup on the structure. The tower structure provides reasonable assurance that it is protected during a high wind event, as defined in NEI 12-01. No seismic evaluation was performed on this tower.

A metal stair case is lying on the ground approximately 3' from the tower base. The stair case is judged to have no adverse effect to the tower function during a seismic, wind, or flooding event. However it should be relocated away from the tower or secured.

Communication Equipment and Racks

Seismic Protection - Enhancement identified. See Table 11, item #1.

- Anchorage
 - Enclosure: The backup batteries are located on a metal stand housed in a small room attached to the enclosure. The metal stand is anchored to the floor but is unsupported at the upper end. The batteries should be fastened to the metal stand shelf and the upper end of the metal stand may require a brace. An additional evaluation is required. Outside the communications enclosure is a low profile transformer. The transformer anchorage could not be verified because of a build-up of silt. It is recommended that the silt be removed to inspect anchorage adequacy.
- Spatial Interactions
 - Enclosure: Inside the enclosure, adjacent to the equipment racks, are an unanchored pump and hoses, a 55-gallon trash barrel, and a metal tool box. These items should be removed or secured.
- Housekeeping
 - The entire room needs to be cleaned up. The portable pump, hoses, tool box and trash barrels should be removed.

Flood Protection - QUESTIONABLE

High Winds Protection - ACCEPTABLE

Antennas - Communications Tower

Seismic Protection - ACCEPTABLE

- Anchorage
 - No concerns
- Spatial Interactions
 - No concerns
- Housekeeping
 - No concerns

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

4.13.3 Emergency Operations Facility

Location and General Description

The EOF is one of several dedicated rooms within the NPPD Offsite Response Center, located in Auburn, Nebraska. The Offsite Response Center is one of several interconnected buildings making up part of the downtown district. It is a one-story commercial block building, with a partial basement.

Equipment & Functionality

The EOF communications equipment room (Telecom Room 117) contains the Base #1 and #2 link radio and a control circuit to the Low Band radio transceiver located at the site. The Base #1 and #2 link radio is connected to antennas mounted on the roof of the building. The Low Band radio console is connected via redundant telecom circuits to the Low Band radio base in the Communications Tower equipment enclosure at the site. The telecom circuit is provided by a private fiber optic system with a backup leased T1. Desktop radio consoles are hardwired to their respective radio transceiver or Low Band control circuit. Wireless headsets are used by the EOF Director, EOF Radiological Control Manager, and the Health Physics Network (HPN) Bridge for offsite communications. There are three satellite phones in the EOF used to communicate with the plant, offsite agencies, and downwind survey field teams.

Power

Primary power to the EOF (Offsite Response Center) is supplied from the local utility. 120V AC power supply to communications equipment is provided from distribution panel MBP through a 10KVA, EATON model 10, System 9355-10, UPS. Backup power is supplied by a Diesel Generator (DG) via an auto-transfer switch. As an enhancement, the UPS batteries should be sized to provide adequate amp hour capacity as required. Enhancement identified (see Table 11, item #2).

Structural Assessment

The Offsite Response Center is a one-story commercial block building, with a partial basement. There are no streams or rivers nearby and the land slopes to the rear of the building providing sufficient runoff during rain storms. Therefore, the building structure provides reasonable assurance that the EP communications equipment is protected during a seismic, wind, or flooding event, as defined in NEI 12-01.

Antennas are attached to a robust steel structural member located on the roof. This provides reasonable assurance that the EP communications equipment is protected during a seismic, wind, or flooding event, as defined in NEI 12-01.

Diesel Generator Room

Seismic Protection - Enhancement identified. See Table 11, item #1.

- Anchorages
 - No concerns
- Spatial Interactions
 - Fluorescent lights in the overhead could fall out of the light fixture and could be secured.
- Housekeeping
 - Combustible materials such as a storage bin, trash barrel, vacuum cleaner, and mop are stored near the DG and should be removed.

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

Telecom Room 117 Communications Equipment and Racks

Seismic Protection - Enhancement identified. See Table 11, item #1.

- Anchorages
 - Rack 1 is anchored to the floor but is unsupported at the free (upper) end. The free end of this rack may require an additional brace. An additional evaluation may be required. The Siren Encoder Radio and CNS base components are not attached to Rack 1 shelf.
 - The nearby UPS is unanchored. This unit should be anchored.
- Spatial Interactions
 - No concerns
- Housekeeping
 - Telecom Room 117 could use a cleaning of papers, miscellaneous unused hardware, and other items.

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

Antennas

Seismic Protection - ACCEPTABLE

- Anchorages
 - No concerns
- Spatial Interactions
 - No concerns
- Housekeeping
 - No concerns

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

4.13.4 Technical Support Center/Operational Support Center (TSC/OSC)

Location and General Description

The TSC/OSC is located inside the PA on the ground floor of the Administration Building at 903' 6" elevation. The TSC and OSC exterior walls, floor and ceiling are constructed of reinforced concrete. Interior walls are similar to an office style environment.

Equipment & Functionality

The TSC contains several PBX-dependent communications bridges. If the site PBX is inoperable (as assumed by this assessment) these bridges would be unavailable. Other installed communications (Central Office lines, Alternate intercom, Sound power, Plant paging) were also initially assumed to be inoperable.

The TSC/OSC inventory includes portable, handheld multi-channel radios which provide point-to-point onsite communications for the OSC and TSC. This includes in-plant operations, radiation protection, and maintenance/repair teams. This is the method credited by this assessment. Some relaying of messages may be required.

The TSC inventory also includes portable satellite telephones, providing communications between key TSC personnel and offsite response organizations.

Power

Installed communication equipment located in the TSC and OSC is powered from lighting panel LP-TSC. Primary power to this panel is fed from the plant 12.5Kv system. On loss of the primary power source, power to panel LP-TSC may be transferred to an alternate power supply (MCC-CA). Backup power to MCC-CA comes from a station DG. During an SBO, the TSC and OSC will have no AC power available.

Structural Assessment

The desktop communication equipment and handheld radios with battery chargers are light weight, and would not ordinarily be affixed to a desk. Therefore from a structural perspective, this equipment is judged as acceptable.

The Administration Building is constructed of concrete and steel. The TSC and OSC are more substantial rooms within the Administration Building and meet regulatory requirements for Emergency Response Facilities (ERF). The Administration Building is built at elevation 903' 6" and has sufficient drainage. Therefore, the building structure provides reasonable assurance that the EP communications equipment is protected during a seismic, wind, or flooding event, as defined in NEI 12-01.

TSC/OSC

Seismic Protection - ACCEPTABLE

- Anchorages
 - No concerns
- Spatial Interactions
 - No concerns
- Housekeeping
 - No concerns

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

4.13.5 Central Alarm Station (CAS)

Location and General Description

The CAS enclosure is located inside the PA interior to the Security Building, not exposed to the outside environment. The CAS enclosure itself is fabricated from plate steel with steel intermediate members. The CAS communications antenna is located outside and adjacent to the Communications Building.

Equipment & Functionality

Radio System Base #3 repeater is installed in a security equipment rack in the CAS enclosure. The radio system Base #3 repeater is a Motorola Quantar repeater, and is connected to an antenna on a tower adjacent to the north wall of the Communications Building. Additional details on these radios and their use is classified as Safeguards Information.

Power

The CAS radio base is powered from a critical MCC, with a UPS as a backup.

Structural Assessment

The CAS structure is an enclosure fabricated from plate steel and steel supporting members. This enclosure is internal to the Security Building at elevation 903' 6". The CAS enclosure provides reasonable assurance that the EP communications equipment is protected during a seismic, wind, or flooding event, as defined in NEI 12-01.

The antenna tower is anchored to a concrete slab and is laterally braced to the Security Building. A less than 1/16" wide crack exists in this slab; however this crack is outside the anchor bolt locations and is judged not to affect the anchor capacity or slab.

The antenna structure provides reasonable assurance that the EP communications equipment is protected during a seismic, wind, or flooding event, as defined in NEI 12-01.

Communication Equipment and Racks

Seismic Protection - ACCEPTABLE

- Anchorages
 - No concerns
- Spatial Interactions
 - No concerns
- Housekeeping
 - No concerns

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

Antenna

Seismic Protection - ACCEPTABLE

- Anchorages
 - No concerns
- Spatial Interactions
 - No concerns
- Housekeeping
 - No concerns

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE

Table 1: Offsite Response Organization

Notifications to, and communications with, OROs [per 10 CFR 50 Appendix E.IV.D and E.9.a]

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed Large Scale External Event (LSEE)?	Backup Method(s) Described in site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Control Room (CR)	1 per Control Room for Communicator	CNS State Notification Telephone System's dedicated line	NO	Two-Way FM Radio System (High Band)	NO	YES Assure CR and OROs have satellite telephone capability.
Technical Support Center	1 for Key TSC Communicator	CNS State Notification Telephone System's dedicated line	NO	Two-Way FM Radio System (High Band)	NO	YES Assure TSC and OROs have satellite telephone capability.

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed Large Scale External Event (LSEE)?	Backup Method(s) Described in site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Emergency Operations Facility	1 for Key EOF Communicator	State Notification Telephone System's dedicated line	NO	Two-Way FM Radio System (High Band)	NO	YES Assure EOF and OROs have satellite telephone capability.

Table 2: Nuclear Regulatory Commission

Notifications to, and communications with, the NRC Headquarters Incident Response Center and the appropriate NRC Regional Office Operations Center [per 10 CFR 50 Appendix E.IV.D and E.9.d]

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Control Room	1 per Control Room for Emergency Notification System (ENS) Communicator	ENS Dedicated Phone Line	NO	Plant Telephone (PBX)	NO	YES – satellite phone
Technical Support Center	1 for ENS Communicator	ENS Dedicated Phone Line	NO	PBX	NO	YES – satellite phone
Location(s) where HPN communications are performed (TSC, EOF)	1 for HPN Communicator	HPN Dedicated Phone Line	NO	PBX	NO	YES – satellite phone

Table 3: Licensee Emergency Response Facilities

Communications between licensee emergency response facilities [per 10 CFR 50 Appendix E.9.c. Additional links that support performance of critical response functions are also specified]. The minimum communications links to support this function are listed below by facility. For example, if the normally used telephone system cannot be restored to service, these links could rely upon some combination of radio, sound-powered, and satellite-based communications systems.

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Control Room	1 per Unit	PBX	NO	Two-Way FM Radio System (High Band)	NO	YES - satellite phone

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Technical Support Center	1 each for: <ul style="list-style-type: none"> • Senior/Lead TSC Manager • Operations Coordination • Maintenance Coordination • Engineering Coordination • Radiological Support Additional response coordination links for multi-unit site: <ul style="list-style-type: none"> • 1 for each position providing Unit Response Coordination 	PBX (ALL)	NO	Two-Way FM Radio System (High Band) (ALL)	NO	YES - satellite phones or handheld radios

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Operations Support Center	1 each for: <ul style="list-style-type: none"> • Senior/Lead OSC Manager • Radiological Support Additional response coordination links for multi-unit site: <ul style="list-style-type: none"> • 1 for each position providing Unit In-Plant Team Coordination 	PBX (ALL)	NO	Two-Way FM Radio System (High Band) (ALL)	NO	YES - satellite phones or handheld radios

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Emergency Operations Facility	1 each for: <ul style="list-style-type: none"> • Senior/Lead Manager • Key Protective Measures • Operations or Technical Support (as needed to support performance of dose projections, formulation of PARs and plant status updates to ORO authorities) 	PBX (ALL)	NO	Two-Way FM Radio System (High Band) (ALL)	NO	YES - satellite phones
Joint Information Center	1 for Senior Manager	PBX	NO	Alternate Intercom system	NO	YES - satellite phone

Table 4: Field / Offsite Monitoring Teams

Communications with field/offsite monitoring teams [per 10 CFR 50 Appendix E.9.c].

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Primary location where field/offsite monitoring team coordination is performed (EOF)	Field/offsite monitoring team coordination	Two-Way FM Radio System (Low Band)	NO	Two-Way FM Radio System (High Band)	NO	YES - satellite phone
Primary location from which field/offsite monitoring teams are deployed (TSC)	1 for each field/offsite monitoring team	Two-Way FM Radio System (Low Band)	NO	Two-Way FM Radio System (High Band)	NO	YES - satellite phones

Table 5: Other Federal Agencies

Communications with other Federal agencies as described in the site E-Plan (e.g., the US Coast Guard) [per 10 CFR 50 Appendix E.9.b]

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Primary location where communication with Federal agencies is performed	Coordination with Federal agencies - CR, TSC, EOF	FTS 2001 Network	NO	Commercial Telephone	NO	YES - satellite phone

Table 6: On-site and In-plant Response Teams

Coordination and direction of on-site and in-plant response teams. This includes teams necessary to affect emergency repairs, firefighting, search and rescue, radiological monitoring, and implementation of Transition Phase coping and severe accident management strategies. To accommodate the timeline associated with NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (as discussed in Section 1).

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
On-shift staff	Number necessary for the onshift staff to perform Initial Phase coping actions (reflecting current staff & strategies)	Station Intercom/ Gaitronics	YES - 4 hours only	Two-Way FM Radios	YES	YES - additional batteries for radios

Emergency Response Facility	Minimum Communications Links	Primary Method Described in Site E-Plan	Primary Method Available Following Assumed LSEE?	Backup Method(s) Described in Site E-Plan	Backup Method(s) Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
Operational Support Center and other site-specific locations as necessary	1 each for: • On-site radiological monitoring 2 each for: • Firefighting (1 for brigade leader and 1 for the brigade) 2 each per unit for: • In-plant radiological monitoring • Search and Rescue • Emergency repairs Site-specific number needed to implement any 2 severe accident mitigation strategies	Station Intercom/Gaitronics	YES - 4 hours only	Two-Way FM Radios	YES	YES - additional batteries for radios

Table 7: Plant Paging (Announcement) System

Emergency Response Facility	Minimum Communications Links	Is This System Available Following Assumed LSEE?	Planned or Potential Enhancement Identified?
N/A (Site-wide)	See assumptions and discussion in NEI 12-01.	YES - 4 hours only	NO

Table 8: Communications Equipment at ORO Facilities

Emergency Response Facility	Minimum Communications Links	Primary Method Described in site E-Plan	Primary Method Available following Assumed LSEE?	Backup Method(s) Described in site E-Plan	Backup Method(s) Available following Assumed LSEE?	Planned or Potential Enhancement Identified?
Location where OROs receive notifications of an emergency declaration or a Protective Action Recommendation (as described in the site emergency plan)	At least one. See assumptions and discussion in NEI 12-01. <u>ORO FACILITY</u> Nebraska State Patrol Nemaha County Sheriff Richardson County Sheriff Missouri State Patrol Atchison County 911 Center	Commercial Telephone (ALL)	NO	NONE (ALL)	NO (ALL)	YES - satellite phones

Table 9: Equipment Locations and Protection

System / Equipment	Primary System Component Location	Equipment protected from the below hazards			
		Protected from Seismic as defined in this document	Protected from Flooding as defined in this document	Protected from Wind as defined in this document	Comments
UHF Radio Base Repeaters and Radio Link	ERP Tower & Enclosure	NO	YES	YES	See Section 4.13.1 for details of protection conclusions
	Communications Tower & Enclosure	NO	NO	YES	See Section 4.13.2 for details of protection conclusions
	EOF	NO	YES	YES	See Section 4.13.3 for details of protection conclusions
	CAS	YES	YES	YES	See Section 4.13.5 for details of protection conclusions

System / Equipment	Primary System Component Location	Equipment protected from the below hazards			
		Protected from Seismic as defined in this document	Protected from Flooding as defined in this document	Protected from Wind as defined in this document	Comments
UHF Radio Base Repeaters and Radio Link	TSC/OSC	YES	YES	YES	See section 4.13.4 for details of protection conclusions

Table 10 CNS Analysis of Required EP Communications Links

Reference NEI 12-01 Section 4, Communications During An Extended Loss of AC Power

	Total number required	Total number on-hand	Additional required
Satellite phones	13	13	0
Radios	22	26 are available in CR and TSC/OSC*	0

* Additional radios are available from Security and Fire Brigade but were not credited.

Several of the reporting requirements listed above are performed by one individual. Below is a list of satellite phones and radios credited for establishing critical communications links.

Facility	Satellite phones	Radios
Control Room		13
• Shift Manager	1	
• Shift Communicator	1	
• Shift Rad. Tech.	1	
Technical Support Center/Operational Support Center		13
• TSC Director	1	
• ENS Communicator	1	
Emergency Operations Facility		
• Emergency Director	1	
• Offsite Communicator	1	
• Field Team Coordinator	1	
Field Monitoring Teams	2	
Joint Information Center		
• Designated Spokesperson	1	
Fire Brigade	2	
Total	13	26

Table 11 Summary of Enhancements

#	Description	Projected Completion Date
1	Resolve issues identified related to anchorages, spatial interactions, and housekeeping.	Complete
2	Evaluate and assure that batteries supporting a minimum of two installed radio system repeaters are sized to provide adequate (24 hour) capacity.	02/28/14
3	Ensure that primary OROs within a 25 mile radius have satellite communications capabilities.	12/31/13
4	Evaluate options and select method(s) to support indoor (remote) access to satellite-based communications.	12/10/13
5	Ensure adequate battery-based power is available to handheld communications devices credited to support prolonged SBO conditions.	Complete
6	Determine if alternative measures now used for inoperable paging coverage areas can be used for site-wide notification.	Complete
7	Ensure enhancements implemented include programmatic support (procedures, inventories, training, testing).	09/30/15
8	Obtain additional GETS cards for key personnel or ERFs.	Complete
9	Install indoor (remote) access to satellite-based communications; three at plant site, three at OROs.	06/30/14

The enhancements identified above may be modified or changed as implementation progresses. Alternate approaches may be utilized if prudent (e.g., alternate/new technology, improved capability, cost savings, etc.).

Figure 1 Block diagram of the CNS radio system, repeater system

Base #1 (NOTE - Print is in the process of being revised as a result of the narrow-banding modification. While the specific equipment models may have changed, basic configuration has not.)

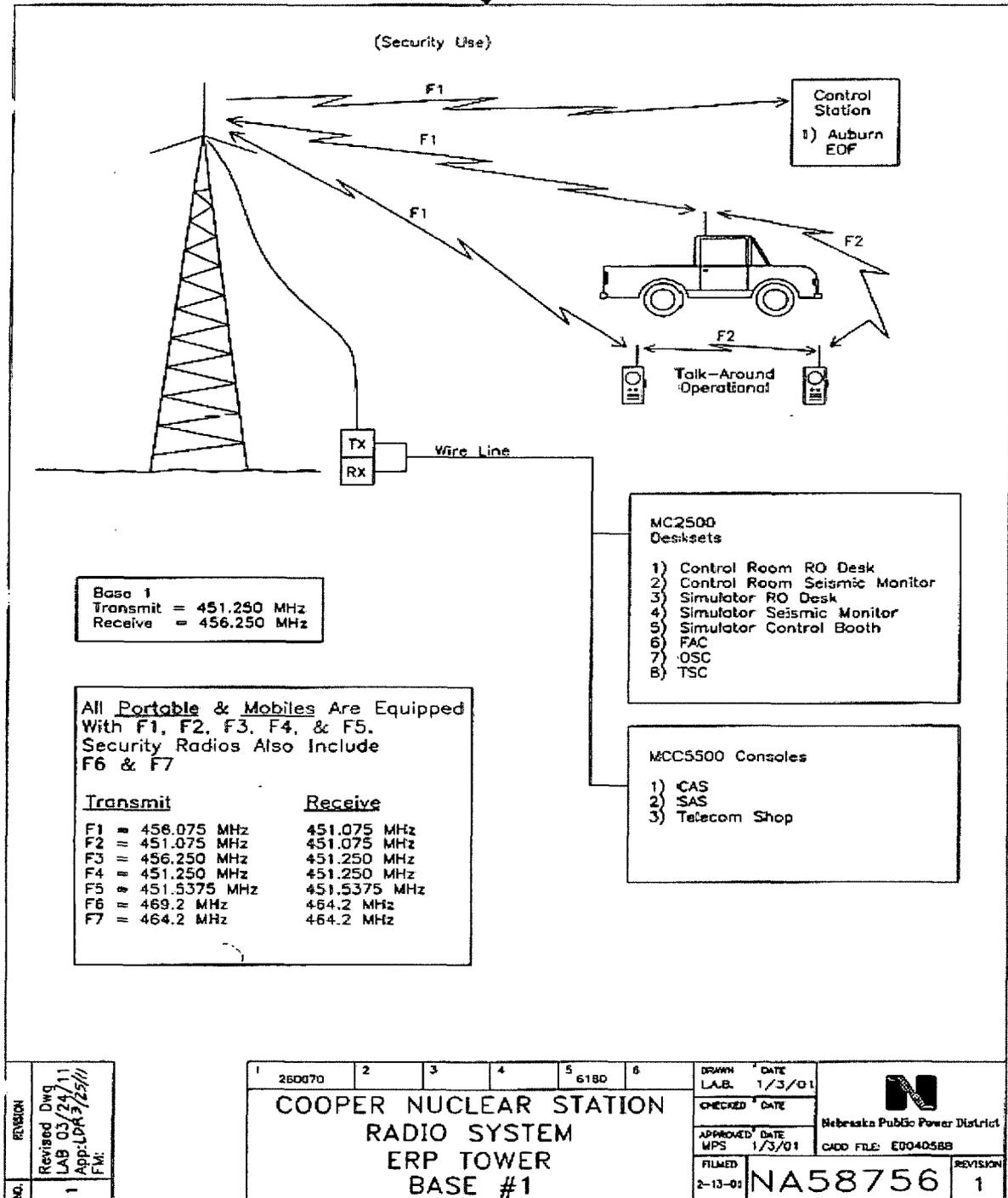


Figure 2 Block diagram of the CNS radio system, repeater system

Base #2 (NOTE - Print is in the process of being revised as a result of the narrow-banding modification. While the specific equipment models may have changed, basic configuration has not.)

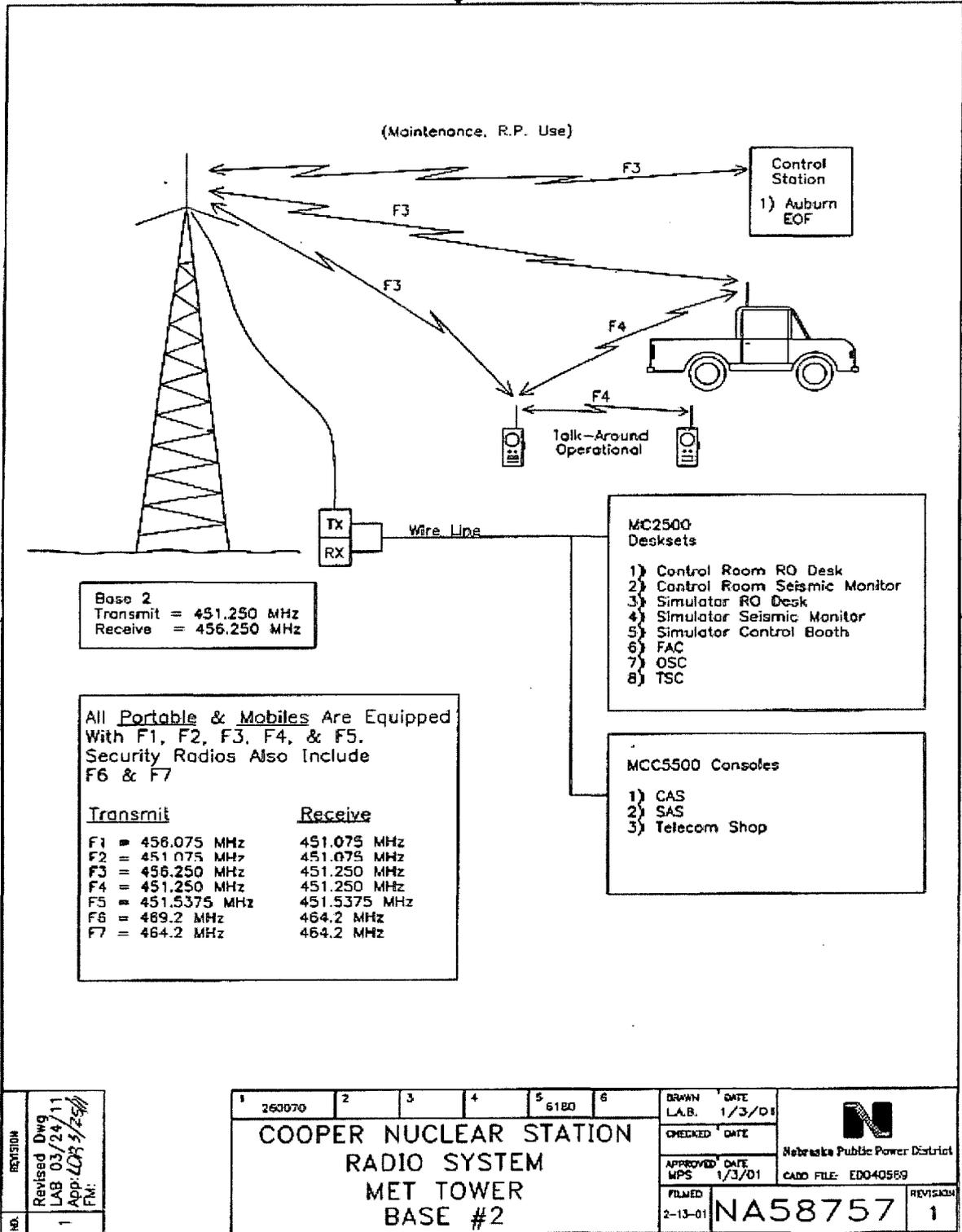


Figure 3 Block diagram of the CNS radio system, repeater system Low-Band (NOTE - Print is in the process of being revised as a result of the narrow-banding modification. While the specific equipment models may have changed, basic configuration has not.)

