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0CAN021304

February 20, 2013

U.S. Nuclear Regulatory Commission
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SUBJECT: Entergy Response to NRC Technical Issues for Resolution Regarding
Licensee Communication Submittals Associated with Near-Term Task
Force Recommendation 9.3
Arkansas Nuclear One – Units 1 and 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6

REFERENCES: 1. NRC letter to Entergy, *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 (0CNA031208) (ML12053A340)

2. Entergy Letter to NRC, *Entergy's 60-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*, dated May 11, 2012 (0CAN051202)

3. Entergy Letter to NRC, *Entergy's 90-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*, dated June 8, 2012 (0CAN061201)

4. Entergy Letter to NRC, *Entergy'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 (0CAN101205)

5. NRC letter to All Power Reactor Licensees, *Follow-up Letter on Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3*, dated January 23, 2013 (0CNA011303)

Dear Sir or Madam:

On March 12, 2012, the NRC issued a letter (Reference 1) entitled, Request for Information Pursuant to Title 10 of the Code of Federal Regulations (CFR) 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.

Entergy Operations, Inc. (Entergy) responded within 60 days (Reference 2) proposing to take the alternative course of action for communications described in Attachment 1 of Reference 2. Entergy 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 (revisions are underlined). 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. Should you have any questions concerning the content of this letter, please contact Stephenie Pyle at 479.858.4704.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 20, 2013.

Sincerely,

Original signed by Jeremy G. Browning

JGB/nbm

- Attachments: 1. Arkansas Nuclear One Communications Assessment – Addressing Eight Technical Issues
2. Supplemented Communications Assessment

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Attachment 1 to

0CAN021304

**Arkansas Nuclear One (ANO) Communications Assessment – Addressing
Eight Technical Issues**

ANO Communications Assessment – Addressing Eight Technical Issues

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 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).**

As stated in Section 2 of the October 31, 2012, submittal, "Communication links are assumed to be established via satellite phones and use of the existing site radio system(s)." Backup power was to be provided via uninterruptable power supplies (UPSs) initially and then by portable generators. Entergy has clarified that it plans to utilize UPS units to provide 24 hours of back-up power for radio system repeaters; see Sections 4.12.1 through 4.12.6. Hand-held equipment (radios and satellite phones) will have adequate spare batteries to provide for 24 hours; see Section 4.1. As such no generator use is planned for the first 24 hours. The specific number of batteries will be determined during the detailed engineering activity of the project. If during detailed engineering and planning, it is identified that these enhancements are not feasible or practical, an alternate approach will be developed.

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.

Communication links will be established using the existing site radio system and satellite phones. Adequate hand-held equipment (radios and satellite phones) will be provided for each link (i.e., no sharing required). As stated in Section 4.6 of ANO's October 31, 2012, submittal, "Entergy has not identified any communication pathway assigned to support multiple functions" (Note that field teams will be using the same radio channel). Entergy will not be implementing shared usage; therefore, a procedure is not required.

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 off-site, 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.**

New power supplies for radio equipment will be installed adjacent to the existing equipment and therefore, are protected per the discussion provided in Section 4.12 of the assessment report. The enhancements identified for the existing equipment would also apply to the new power supplies. Section 4.5 of the report has been revised to clarify this point.

No equipment is currently planned to be stored off site.

Analysis is per section 4.12 of the assessment report.

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 a 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.**

Section 4.8 has been revised to indicate that existing site procedures for inventory checks and testing will be updated and used for the new equipment. Site maintenance programs will be used as appropriate for controlling required maintenance (e.g., replacing UPSs' batteries).

Section 4.11 has been revised to indicate that training will be conducted to ensure personnel are familiar with the operation of the new equipment, storage location and any other requirements. A specific procedure number has not been identified at this time.

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."**

Section 3 has been revised to indicate that assumptions are as stipulated in NEI 12-01.

Technical Issue 6:

How plant personnel will be notified in the event of a large scale natural event that causes a loss of all alternating current (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 site Emergency Plan).**

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

Section 4.2 has been revised to indicate that plant personnel will become aware of the large scale natural event by personal observation. General Employee Training will be updated to include direction regarding actions to be taken by personnel upon observation of the event. That is, they are to report to the designated site assembly area. Site accountability processes will be implemented to ensure all personnel are notified.

Section 4.4 indicates that notification of the Emergency Response Organization (ERO) will be as discussed in Section 4.4 (second bullet) of NEI 12-01. This expectation has been communicated to site EROs and has been included in initial and continuing ERO training.

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 in place to bridge the gap until all final mitigation strategies being proceduralized are implemented. This also includes equipment protection.

Section 5 has been added to the submittal providing summary of interim actions, including:

- Number of satellite phones provided (minimum of 11 at dual unit sites)
- Existing radio system capability during loss of alternating current (AC) power (e.g., existence of UPS, talk around capability, etc.)
- ERO notification methodology established/implemented

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.

Section 6 has been added to the report and includes a table providing target dates for implementation of the identified enhancements.

Section 4.3 indicates that all Offsite Response Organization (ORO) facilities that receive notifications have back up power and that some of the facility would require the addition of a satellite phone. Entergy has clarified that it will ensure all ORO facilities have satellite phones.

Attachment 2 to

0CAN021304

Supplemented Communications Assessment

Supplemented Communications Assessment

1. Executive Summary:

The purpose of this report is to document performance of an NRC-requested assessment of the current communications systems and equipment used at the Arkansas Nuclear One (ANO) site (Units 1 and 2) 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 to be 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 communications capabilities inoperable. The assessment identifies enhancements to maintain communications capabilities for responding to emergency events. These enhancements include:

- Further evaluation relating to the expanded use of the Arkansas Department of Emergency Management (ADEM) Arkansas Wireless Information Network (AWIN) radio system for ANO communications with offsite response organizations (OROs).
- Improvements to the structural supports for existing radio equipment.
- Improvements to radio equipment power supplies including: spare batteries for hand-held equipment, uninterruptable power supplies (UPSs)/batteries for fixed equipment, and portable generators for powering/charging equipment.
- Added portable radios and expansion of current satellite-based communications capability.

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 alternating current (AC) power, including evaluation of power sources for communications equipment. This approach provides the flexibility to perform a communications capability assessment that accommodates specific site needs while, at the same time, ensuring consistency with industry-developed standards, and NRC regulations and guidance.

The assessment focused on the communication systems to be credited. For example, existing telephone communications are assumed to be inoperable and therefore are not credited or evaluated in this assessment. Communication links are assumed to be established via satellite phones and use of the existing site radio system(s). Walkdowns to evaluate the equipment locations and function were performed. Enhancements identified within 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 (The assumptions as stated in NEI 12-01 form the basis for this assessment, including):

- Extended loss of AC power event
- Successful plant shutdown
- No hostile action
- Six hours post event – no site access
- Six-24 hours post event – limited site access, individual access by walking, personal transport, or alternative transport
- 24+ hours post event – site access restored to near normal status
- Installed sources of AC power not available
- Non-essential loads from direct current (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 direct current (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)

Entergy has reviewed the communications links and has determined the method of communications (i.e., radio or satellite phone) for each defined link and overall number of satellite phones and radios needed. The analysis has determined in order to establish the required links, additional satellite phones and hand-held radios are needed. Spare batteries are also needed. Adequate batteries to provide 24 hours of hand-held equipment (radios and satellite phones) usage should be provided. The attached rollup tables provide additional detail on the identified communication links.

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 ANO plant paging system provides public address capability over a large portion of the site. Considering the event as defined by NEI 12-01, the system is limited primarily by the lack of system-wide back-up power. Although portions of the system may be available, it will not be credited as available for notification of plant personnel. Alternative measures should be established (e.g., non-essential plant personnel should be trained to report to site assembly areas during SBO conditions). Plant personnel will become aware of the large scale natural event by personal observation (e.g., loss of lighting). Personnel training (General Employee Training (GET)) will be updated to include direction regarding actions to be taken by personnel upon observation of the event. That is, they are to report to the designated site assembly area(s). Site accountability process will be implemented to ensure all personnel are notified.

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." Entergy has assessed capabilities at their ORO facilities. All seven ORO facilities (Conway County, Johnson County, Logan County, Pope County, Yell County, the Arkansas Department of Health, and ADEM) have backup power. Additional communication capabilities (e.g., satellite phones) would be required at some of the facilities. Entergy will ensure that the ORO facilities have satellite phones.

4.4 Notification of the Emergency Response Organization (ERO) (NEI 12-01 Section 4.2)

NEI 12-01 offers two potential options to promote timely staff augmentation by the ERO. ANO ensures that "ERO members are trained to automatically respond to their assigned facilities or a designated staging area when made aware of a wide loss-of-grid (e.g., by direct observation, media reports, word-of-mouth, etc.)." This expectation has been communicated to the ERO and has been included in initial and annual ERO requalification training.

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 should be established using satellite phones and radios. Existing, installed communications equipment to be credited (i.e., considered operable) is limited to the plant radio system(s). Assessments have been performed, including walk-downs, of the existing installed radio equipment. Enhancements are recommended to address some identified concerns associated with the equipment's ability to survive a seismic event. Structural capability of the equipment support/mounting as well as impact from adjacent equipment and/or stored material should be addressed. Power supply enhancements are expected to be installed adjacent to the existing equipment and therefore, would be subject to same assessment findings and resulting enhancements. Enhancements are recommended to address some identified concerns associated with wetting from flooding for some backup power supplies onsite. See Sections 4.12.1 through 4.12.6 and Table 9

in the attached rollup tables for details. Programmatic requirements need to be established to ensure the credited equipment is maintained in a manner that maximizes survivability.

No equipment is currently planned to be stored offsite for onsite use.

4.6 Performance Characteristics (NEI 12-01 Section 4.6)

The performance characteristics as identified in this section of NEI 12-01 requires that communication pathways (e.g., radio channels, satellite phone) designated to support multiple functions must be analyzed to demonstrate that they can simultaneously support both functions. Entergy has not identified any communication pathway assigned to support multiple functions.

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 should be established.

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

The requirements identified in this section of NEI 12-01 should be incorporated into the program for ensuring the credited equipment is maintained in a manner that maximizes survivability. Programmatic controls should be established to ensure that equipment remains available and operable. Existing site inventory and test procedures will be updated and used for the new equipment to ensure the equipment is available and operable. Site maintenance programs will be used as appropriate for controlling required maintenance (e.g., replacing UPS batteries).

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

ANO already has Government Emergency Telecommunications Services access cards in both onsite and offsite emergency response facilities to aide in the routing of phone calls during high traffic effects following an emergency event. The use of Telecommunications Service Priority (TSP) for voice circuits should be evaluated for potential enhancements at the site.

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

Entergy has contacted the major communications service providers which service the Entergy nuclear fleet (i.e., Verizon and AT&T). Neither company has a separate emergency services priority other than government TSP, which is addressed in Section 4.9. No further enhancements are planned.

4.11 Personnel Training (NEI 12-01 Section 4.11)

Additional training is needed to ensure required ERO and plant staff is familiar with the credited equipment's use, storage location, and other requirements. Training may include: drills, tabletops, classroom, and/or computer-based training. Appropriate personnel will be familiarized with the communication equipment use, capabilities, and limitations during the interim period prior to full implementation of the identified enhancements.

4.12 Equipment Locations and Capabilities

The communications functions, radio reception/transmission equipment, and protection of each location from seismic, wind, and flooding are discussed below. Specifically, the structural capacity of the equipment in its current configuration was evaluated in 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.

It is required that emergency plan (EP) communication equipment be reasonably protected from a beyond-design-basis seismic event. To the extent possible, the existing guidance provided in Electric Power Research Institute NP-6041, *Nuclear Power Plant Seismic Margin*, is used for determination of the seismic/wind design capabilities of structures containing systems, structures, and components (SSCs) in the vicinity (adjacent and overhead) of existing EP communication equipment. Additionally, procedures should be developed to ensure secure storage of EP communication equipment including consideration of adjacent equipment/material that may pose a potential seismic/wind interaction hazard.

Where these procedures and guidance cannot be applied, it should be ensured that EP communication equipment be contained within one or more of the configurations:

- In an existing safety-related structure designed for the Safe Shutdown Earthquake, or
- In a structure designed to or evaluated equivalent to American Society of Civil Engineers 7-10, *Minimum Design Loads for Buildings and Other Structures*, or
- Outside a structure and evaluated for seismic interactions to ensure equipment is not damaged by non-seismically robust components or structures, and
- Equipment is located above the design basis flood elevation for the plant (361') or is otherwise protected and would not be subjected to localized flooding.

The sections below provide a summary of the area walkdowns and their potential configuration concerns that could present challenges in maintaining an operable communication system in the event of one or more of the identified environmental hazards.

4.12.1 Emergency Operations Facility (EOF)

Location and General Description:

The EOF Command Room and EOF Radio Room are located on the second floor of the Nuclear Training Center at El. ~+460'. The EOF Microwave Building, antenna towers, and backup generator are located outside behind the training center on grade (El. ~+450'). The EOF Battery Room, Electrical Room and Mechanical Room are located at El. ~+444'. The Nuclear Training Center is a two story seismic category II structure. The building is supported by spread footings on compact fill, steel-framed, and the exterior walls are constructed of pre-cast concrete panels. The Nuclear Training Center first floor is designated as a tornado shelter area.

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

The EOF Microwave Building structure provides reasonable assurance that the EP communications equipment is protected during a seismic event, as defined in NEI 12-01.

Equipment and Functionality:

The EOF Command Room contains multiple communication links including commercial telephone, plant telephone, Ultra High Frequency (UHF) radio link and the Federal Network Emergency Notification System (ENS), Health Physics Network (HPN), etc). The EOF Radio/Telephone Room contains the T1 line channel banks and associated DC power supplies. The EOF Mechanical Room contains the auto transfer switch for the EOF diesel generator. The EOF Electrical Room contains electrical panel EH2 (see power below). The EOF Battery Room contains the EOF backup battery racks. The EOF Microwave Building contains a battery charger, a 15KVA Kohler generator, and the offsite field team radio.

Power:

EOF Command Room

The EOF Command Room communications equipment is backed by a diesel generator and a local battery with at least 24 hours of capacity.

EOF Radio/Telephone Room

The DC-powered equipment in the EOF Radio/Telephone Room is fed directly from batteries. The AC equipment is powered from a 5KW inverter fed from the battery bank. The battery bank is rated at 1010AH and is designed to supply power for at least eight hours. The batteries are charged from redundant chargers supplied by Panel EL5. The local telephone company, CenturyLink, supplies local service via equipment in this room. DC power for their equipment is supplied by the same EOF battery bank. Panel EL5 is fed from EOF panel EH2, panel MED, and transfer switch ATS. The ATS transfer switch provides power from the commercial mains or the EOF diesel generator.

EOF Microwave Building

All DC-powered communications equipment is fed directly from a battery bank and is designed to supply power for at least eight hours. The single battery charger and all other AC-powered equipment are supplied from commercial mains and backed up by an automatic-start 15KVA Kohler generator fueled by a 500-gallon propane tank.

Neither the 15KVA Kohler generator nor the EOF diesel generator is credited in this assessment (Section 3 - Assumptions).

It is unknown whether the battery banks are of sufficient capacity to meet the communications equipment power demands. Thus, no credit is taken for the batteries. It is recommended that the amp-hour capacity of the EP communications equipment battery systems be assessed to determine that the battery is capable of providing power until temporary power can be supplied by mitigation equipment connected in accordance

with the Diverse and Flexible Coping Strategies (FLEX) procedures implemented during or following the event.

Structural Assessment:

Seismic Protection – ENHANCEMENT

- Anchorages
 - EOF Microwave Building – propane tank for backup generator not anchored to concrete pad.
 - EOF Battery Room – batteries sit on battery rack without seismic rails, and battery rack is not anchored to floor.
- Spatial Interactions
 - EOF Radio Room, Second Floor – Cart with wheels near communication rack.
 - EOF Battery Room, First Floor – Eyewash tank on cart not tied to wall; potential tipping hazard onto batteries.

Flood Protection – ACCEPTABLE

High Winds Protection – ACCEPTABLE (equipment located inside building)

4.12.2 Node 2 Switch Room

Location and General Description:

The Node 2 Switch Room (a.k.a., Maintenance Facility Switch Building) is located within the protected area just outside of the ANO-2 Turbine Building on grade (approximately El. ~+354'). The Node 2 Switch Room contains the channel bank rack and batteries. The switch room is a small pre-fabricated trailer-like structure on skid bolted to a concrete pad; interior flooring is linoleum floor tiles on plywood sub-floor, and its exterior is made of fiberglass.

The backup diesel generator 2K10 is located in its own enclosure building located within the protected area near the Central Support Building (CSB) on grade (approximately El. ~+354'). The enclosure is made of un-reinforced block walls and has a large rolling door. The fuel oil tank is integral to the diesel engine.

The Node 2 Switch Room (Maintenance Facility Switch Building) structure provides reasonable assurance that the EP communications equipment is protected during a seismic event as defined in NEI 12-01.

The backup diesel generator 2K10 enclosure does not provide reasonable assurance that the EP communications equipment is protected during a seismic event as defined in NEI 12-01. See "Seismic Protection" discussion below.

Equipment and Functionality:

The Node 2 Switch Room contains network communications equipment and associated battery chargers and battery banks.

Power:

DC-powered equipment is fed directly from the batteries. AC equipment is powered from a 3kW inverter fed from the battery bank. The battery bank is rated at 1176AH and is designed to supply power for at least eight hours. The batteries are charged from redundant chargers supplied by the local distribution panel. The AC power feed to this building comes from CSB panel P1C breakers 7 and 9.

The backup diesel generator 2K10 is not credited in this assessment (Section 3 Assumptions).

It is unknown whether the battery banks are of sufficient capacity to meet the communications equipment power demands. Thus, no credit is taken for the batteries. It is recommended that the amp-hour capacity of the EP communications equipment battery systems be assessed to determine that the battery is capable of providing power until temporary power can be supplied by mitigation equipment connected in accordance with FLEX procedures implemented during or following the event.

Structural Assessment:

Seismic Protection – ENHANCEMENT

- Anchorages
 - Node 2 Switch Room - batteries sit on battery rack without seismic rails, and battery rack is not anchored to floor.
- Spatial Interactions
 - The backup diesel generator 2K10 enclosure building is made of un-reinforced block walls. The block wall building is a single roomed structure greater than 16 ft. high. The diesel generator 2K10 enclosure building is not seismically adequate.
 - Node 2 Switch Room – Storage cabinet and boxes near the batteries.

Flood Protection – ENHANCEMENT

- Both the Node 2 Switch Room and diesel generator 2K10 are located at elevation below the design flood elevation. The Node 2 Switch Room and diesel generator 2K10 grade is approximately El. ~+354' and is below the design flood elevation at El. 361' for ANO.

High Winds Protection - ENHANCEMENT

- The backup diesel generator 2K10 enclosure building is made of un-reinforced block walls. The block wall building is a single roomed structure greater than 16 ft. high. The diesel generator 2K10 enclosure building may not be protected from high wind effects.

4.12.3 Mount Nebo Radio House

Location and General Description:

The Mount Nebo Radio House and antenna tower are located on top of Mount Nebo approximately a 30-minute drive from the ANO site (approximately six miles). The radio house is a small pre-fabricated trailer-like structure on skid; interior flooring is linoleum floor tiles on plywood sub-floor, and its exterior is made of fiberglass. The radio house contains a radio repeater and transmitter and two propane generators (one automatic-start and one manual-start) which provide backup power to the radio house.

The Mount Nebo Radio House structure provides reasonable assurance that the EP communications equipment is protected during a seismic event as defined in NEI 12-01.

Equipment and Functionality:

The Mount Nebo Radio House contains a radio repeater, an automatic-start 15KVA Kohler generator, and a manual-start 10KVA Onan generator.

Power:

All DC-powered communications equipment is fed directly from a battery bank and is designed to supply power for at least eight hours. The single battery charger and all other AC-powered equipment are supplied from commercial mains and backed up by an automatic-start 15kVA Kohler generator fueled by a 500-gallon propane tank. In addition there is a manual-start 10kVA Onan generator fueled by a 250-gallon propane tank. However, due to the assumption criteria in NEI 12-01, no credit is being taken for the generator; therefore, a UPS will be added with 24 hours of capacity. Satellite phones may be provided to the offsite field monitoring teams to use in lieu of the radios.

Structural Assessment:

Seismic Protection – ENHANCEMENT

- Anchorages
 - The two interconnected propane tanks outside are not anchored to the concrete pad. The propane tanks supply fuel to both the automatic-start Kohler generator and the manual-start Onan generator.
 - Two out of three hold down clips were not installed on the radio house backside tying the skid to the concrete pad.

- Spatial Interactions
 - Recommend locking down wheels on small tool chest near radio rack.

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE (equipment located inside building)

4.12.4 Turbine/Auxiliary Buildings

Location and General Description:

The Safety Parameter Display System (SPDS) Computer Room is located on the turbine deck El. +386' and contains the EP communication channel bank rack. The UPS is located on the Turbine Building second floor. The battery (D13) and battery charger (D33) are located on the Auxiliary Building second floor at El. +372'.

The Turbine Building and Auxiliary Building structures provide reasonable assurance that the EP communications equipment is protected during a seismic event as defined in NEI 12-01.

Equipment and Functionality:

The SPDS Computer Room contains T1 Line Channel Banks and associated AC/DC power supplies. Turbine Building Room 2091 contains the UPS. The Auxiliary Building second floor Battery Room 2103 contains 125VDC Battery D13. Battery Charger D33 is located in the Auxiliary Building second floor open area.

Power:

The AC/DC power supplies in the SPDS Computer Room are fed from power panel 53PA, which is fed from inverter/UPS Y26 (fed by either 480VAC Motor Control Center B54 or B53 or 125VDC Control Center D03). The 125VDC Control Center D03 is fed from Battery Charger D33 and 125VDC Battery D13. Since the DC power is supplied from a 125VDC Station Battery, it is assumed that power remains available for this equipment during the six-hour "no access" time until additional power sources can be restored.

Structural Assessment:

Seismic Protection – ACCEPTABLE

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE (equipment located inside building)

4.12.5 Administration Building

Location and General Description:

The Administration Building is an office building onsite at the south end of the Turbine Building. The Technical Support Center (TSC) is located in the Administration Building on the third floor at El. +382'. The Administration Building Radio/Telephone Room is located in the Administration Building on the second floor at El. +368'. A portion of the building is two stories tall connected to a portion that is five stories tall. The Administration Building original portion is a steel-framed and concrete structure with steel framing on spread footings on compacted backfill. The five story portion of the Administration Building (Expansion I and II) has drilled shaft foundation down to hard shale to El. ~+325'. The Administration Building grade is El. +354'.

The Administration Building structure provides reasonable assurance that the EP communications equipment is protected during a seismic event as defined in NEI 12-01.

Equipment and Functionality:

The TSC contains a four-wire, five-way communications bridge, as well as commercial and plant phone lines and portable satellite phones. The Administration Building Radio/Telephone Room contains the radio link repeaters and antenna combiner.

Power:

The EP communications equipment in the TSC is powered from an AC-DC power supply fed from panel 32B which is fed from panels DP-30, DP-29, and DP-28 and is both security diesel-backed and UPS-backed. The radio equipment in the Administration Building Radio/Telephone Room is powered from redundant AC-DC power supplies; one is fed from AC panel TP, and one is fed from AC panel 22C. Both of these panels are security diesel-backed and UPS-backed.

The security diesel generator is not credited in this assessment (Section 3 - Assumptions).

It is unknown whether the UPS is of sufficient capacity to meet the communications equipment power demands. Thus, no credit is taken for the UPS. It is recommended that the amp-hour capacity of the EP communications equipment UPS systems be assessed to determine that the UPS is capable of providing power until temporary power can be supplied by mitigation equipment connected in accordance with FLEX procedures implemented during or following the event. Therefore, the UPS will be assured to have 24 hours of capacity.

Structural Assessment:

Seismic Protection – ENHANCEMENT

- Anchorages
 - According to ANO radio technician who has security clearance, the UPS and batteries are not anchored to floor inside Security Room (walkdown team could

not enter the security diesel generator or the UPS and batteries in Security Room 528 on the first floor).

- Spatial Interactions
 - Administration Second Floor Radio Room – Active roof leak into room, and roof leak locations have been identified with a catch tray at the ceiling.

Flood Protection – ENHANCEMENT

- The Administration Building grade is at El. +354', the second floor is at El. +368', and the third floor is at El. +382'. The Administration Building grade and first floor are below the design flood elevation at El. +361' for ANO. The EP-related equipment on grade and in the Administration Building first floor is the security diesel generator located outside and the UPS and batteries in Security room 528 on the first floor.

High Winds Protection - ACCEPTABLE (equipment located inside building)

4.12.6 Generation Support Building (GSB)

Location and General Description:

The GSB is three stories tall and an office-type building located outside the protected area. The AWIN radio system is located in GSB Communication/Telephone Room 320 on the third floor and the GSB backup diesel generator is located outside near the parking lot. The GSB is a steel-framed and concrete building built to Southern Building Code. The building exterior is of pre-cast concrete panels. The GSB grade is El. +361', and the third floor is at El. +389' which is at or above the design flood elevation at El. +361' for ANO. There is a rooftop AWIN radio antenna mounted to the building air handler.

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

Equipment and Functionality:

The GSB Communication/Telephone Room 320 contains the AWIN radio system, a 6KW inverter, and battery banks.

Power:

DC-powered equipment is fed directly from the batteries. AC equipment is powered from a 6KW inverter fed from the battery bank. The battery bank is rated at 840AH and is designed to supply power for at least eight hours. The batteries are charged from redundant chargers supplied by Panel L56.

The local telephone company, CenturyLink, supplies local service via equipment in this room. Their equipment is powered by their own batteries and redundant chargers. Power for their chargers comes from panel L57.

Panels L56 and L57 are fed from GSB panel P1A and S-108 transfer switch. The S-108 transfer switch provides power from the commercial mains or the GSB diesel generator.

The GSB diesel generator is not credited in this assessment (Assumption 3.6.5).

It is unknown whether the battery banks are of sufficient capacity to meet the communications equipment power demands. Thus, no credit is taken for the batteries. It is recommended that the amp hour capacity of the EP communications equipment battery systems be assessed to determine that the battery is capable of providing power until temporary power can be supplied by mitigation equipment connected in accordance with FLEX procedures implemented during or following the event. Therefore, the batteries will be assured to have 24 hours of capacity.

Structural Assessment:

Seismic Protection – ENHANCEMENT

- Anchorages
 - Third floor Communication Room – Battery banks are not anchored to raised concrete pad.
- Spatial Interactions
 - Third floor Communication Room – Metal cabinet door panels behind inverter rack leaning against wall; metal file cabinet next to inverter rack; miscellaneous boxes on top of battery banks.

Flood Protection - ACCEPTABLE

High Winds Protection - ACCEPTABLE (equipment located inside building)

5.0 INTERIM ACTIONS

Interim measures were initially provided under letter OCAN061201, *Entergy's 90-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*, dated June 8, 2012. Interim measures include:

- Satellite phones (13) are staged in the TSC. The phones are stored in hardened/cushioned cases or cabinets for protection. User aids are located with the phones for ease of use.
- Additional hand-held radios (20) and spare batteries have been purchased and staged in the TSC, Operations Support Center (OSC), and EOF. Radios are stored in hardened/cushioned cases or cabinets for protection. Site personnel are familiar with use of these type radios.
- Hand-held radios are programmed with talk around capability (allows usage without repeaters for limited distances).
- The primary repeater for the onsite radios is equipped with a UPS that provides some backup power capability.

- ERO notification methodology (per NEI 12-01, Section 4.4, second bullet) has been determined and implemented (see section 4.4 above).

6.0 SCHEDULE

The above assessment has identified potential enhancements to provide the required communications capability during a beyond-design-basis event consistent with the assumptions specified in NEI 12-01. The table below summaries required actions and provides target completion dates.

| Implementing Actions | Target Completion Date |
|---|------------------------|
| Communication Equipment | |
| • Additional satellite phones staged in TSC | complete |
| • Additional radios/batteries staged in TSC, OSC, and EOF | complete |
| • Resolve non-engineering spatial interactions | complete |
| • Complete engineering for indentified enhancements (e.g., power supplies and structural upgrades) | 12/20/14 |
| • Procure additional portable equipment (e.g., radios, satellite phones, batteries, generators) as required | 3/20/15 |
| • Complete installation of engineered upgrades | 10/15/15 |
| Communication with OROs | |
| • Ensure ORO facilities are equipped with satellite phones | complete |
| Miscellaneous | |
| • ERO notification methodology implemented | complete |
| • Finalize storage location(s) of portable generators | 3/20/15 |
| • Finalize training needs | 12/20/14 |
| • Implement required training | 10/15/15 |
| • Revise procedures to incorporate new equipment | 10/15/15 |
| • Revise GET to include assembly requirements during a large scale external event | 12/31/13 |
| • Ensure adequate Government Emergency Telecommunication Service cards are available | 12/31/13 |
| • Complete evaluation of TSP circuits | 12/31/13 |
| • Implement TSP enhancements per evaluation results | 12/31/14 |

Rollup Document

Consistent with emergency planning standard requirements, communications systems, and equipment associated with the following emergency response functions should be available during an extended loss of AC power. Availability should be determined after a review of existing capabilities and consistent with the assumptions listed in NEI 12-01, Revision 0, Section 2. In particular, it is important that the primary and backup power source (if applicable) for each communications system or piece of equipment be identified.

End-point equipment identified for a communications link listed below should be used solely for the purpose indicated. For example, a satellite telephone assigned to the control room should not be credited for performing both ORO and NRC notifications.

Note: Enhancements have been identified for power supplies for credited equipment (i.e., equipment expected to be operable following a large scale external event (LSEE). Detailed engineering should be performed to finalize the approach for these enhancements (e.g., UPS/batteries and/or portable generators).

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 LSEE? | Backup Method(s) Described in site E-Plan | Backup Method(s) Available following Assumed LSEE? | Planned or Potential Improvement Identified? |
|-----------------------------|------------------------------|---|--|---|--|--|
| Unit 1 Control Room | Unit 1 Shift Manager (SM) | Commercial Telephone | No | UHF Radio Link | No | Yes – satellite phone |
| Unit 2 Control Room | Unit 2 SM | Commercial Telephone | No | UHF Radio Link | No | Yes – satellite phone |
| TSC | 1 for Key TSC Communicator | Commercial Telephone | No | UHF Radio Link | No | Yes – satellite phone |
| EOF | 1 for Key EOF Communicator | Commercial Telephone | No | UHF Radio Link | No | Yes – satellite phone |

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 Improvement Identified? |
|-----------------------------|------------------------------|---|--|---|--|--|
| Unit 1 Control Room | U1 NRC ENS Communicator | U1 ENS Bridge - Dedicated phone | No | Commercial Telephone | No | Yes – satellite phone |
| Unit 2 Control Room | U2 NRC ENS Communicator | U2 ENS Bridge - Dedicated phone | No | Commercial Telephone | No | Yes – satellite phone |
| TSC | 1 for ENS Communicator | ENS Bridge - Dedicated phone | No | Commercial Telephone | No | Yes – satellite phone |
| OSC | 1 for HPN Communicator | HPN Bridge - Dedicated phone | No | Commercial Telephone | 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 Improvement Identified? |
|-----------------------------|--|---|--|---|--|---|
| Unit 1 Control Room | U1 Control Room Supervisor /SM | Plant Phone | No | UHF Radio | No | Yes- structural and power supply(s) and/or satellite phone |
| Unit 2 Control Room | U2 Control Room Supervisor/SM | Plant Phone | No | UHF Radio | No | Yes- structural and power supply(s) and/or satellite phone |
| TSC | 1 each for: <ul style="list-style-type: none"> • Senior/Lead TSC Manager • Operations Coor. • Maintenance Coor. • Engineering Coor. • Radiological Sup. Additional response coordination links for multi-unit sites: <ul style="list-style-type: none"> • 1 for each position providing Unit Resp. Coor. | Plant Phone | No | UHF Radio | No | Yes - structural and power supply(s) and/or 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 Improvement Identified? |
|-----------------------------|--|---|--|---|--|---|
| OSC | 1 each for: <ul style="list-style-type: none"> • Senior/Lead OSC Manager • Radiological Sup. Additional response coordination links for multi-unit sites: <ul style="list-style-type: none"> • 1 for each position providing Unit In-Plant Team Coord. | Plant Phone (All) | No | UHF Radio | No | Yes - structural and power supply(s) and/or satellite phone |
| EOF | 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 protective action recommendations and plant status updates to ORO authorities) | Plant Phone (All) | No | UHF Radio | No | Yes - structural and power supply(s) and/or satellite phone |
| Joint Information Center | 1 for Senior Manager | Plant Phone | No | None | NA | 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 Improvement Identified? |
|--|--|---|--|---|--|--|
| Primary location where field/offsite monitoring team coordination is performed (EOF) | Field/offsite monitoring team coordination | EOF Field Monitoring Team - UHF Radio | No | None | N/A | Yes - structural and power supply(s) |
| The location from which field/ offsite monitoring teams are deployed (EOF) | 1 for each field/offsite monitoring team | UHF Radio | No | None | N/A | Yes – structural and power supply(s) |

Table-5: Other Federal Agencies

Communications with other Federal agencies as described in the site emergency 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 Improvement Identified? |
|---|---|---|--|---|--|--|
| Primary location where communication with Federal agencies is performed | Coordination with Federal agencies – Control Room | Telephone | No | None | N/A | Yes – satellite phone |
| | Coordination with Federal agencies – EOF/TSC | Telephone | No | None | N/A | 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 Improvement Identified? |
|-----------------------------|---|---|--|---|--|--|
| On-shift staff | Number necessary for the on-shift staff to perform Initial Phase coping actions (reflecting current staff and strategies) | On Shift Responders Radio | No | None | N/A | Yes – structural and power supply(s) |

| 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 Improvement Identified? |
|--|--|--|--|---|--|--|
| OSC and other site-specific locations as necessary | <p>1 each for:</p> <ul style="list-style-type: none"> • On-site radiological monitoring <p>2 each for:</p> <ul style="list-style-type: none"> • Firefighting (1 for brigade leader and 1 for the brigade) <p>2 each per unit for:</p> <ul style="list-style-type: none"> • In-plant radiological monitoring • Search/Rescue • Emergency Repairs <p>Site-specific number needed to implement any 2 severe accident mitigation strategies</p> | <p>RP - Radio</p> <p>Fire Brigade - Radio</p> <p>RP - Radio</p> <p>Repair Teams - Radio</p> | No | None | N/A | Yes – structural and power supply(s) |

Table-7: Plant Paging (Announcement) System

| Emergency Response Facility | Minimum Communications Links | Is this system available following assumed LSEE? | Planned or Potential Improvement Identified? |
|-----------------------------|--|--|--|
| N/A | See assumptions and discussion in NEI 12-01. | No | Yes – alternate approach see Section 4.2 |

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 Improvement 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> Conway Co. | DEF/VS - Direct Commercial Line | No | ADEM Radio | Yes* (All) | Yes – satellite phones, ADEM Radio (AWIN) Power Upgrades/Setup |
| | Johnson Co. | DEF/VS - Direct Commercial Line | No | ADEM Radio | | |
| | Logan Co. | DEF/VS - Direct Commercial Line | No | ADEM Radio | | |
| | Pope Co. | DEF/VS - Direct Commercial Line | No | ADEM Radio | | |
| | Yell Co. | DEF/VS - Direct Commercial Line | No | ADEM Radio | | |
| | ADH (State) | DEF/VS – Direct Commercial Line | No | ADEM Radio | | |
| | ADEM (State) | DEF/VS – Direct Commercial Line | No | ADEM Radio | | |

*There would be limited radio communication capability.

Table-9: Equipment Locations and Protection

| System/Equipment | Primary System Component Location | Protected from Seismic | Protected from Flooding | Protected from Wind |
|---|--|-------------------------------|--------------------------------|----------------------------|
| UHF Radio Equipment (Radios, Repeaters, Battery Banks, T1 Channel Banks, 5-way Bridge, UPS, etc) | EOF Battery Room | Yes | Yes | Yes |
| | EOF Microwave Building | Yes | Yes | Yes |
| | EOF Radio/Telephone Room | Yes | Yes | Yes |
| | EOF Electrical Room | Yes | Yes | Yes |
| | EOF Mechanical Room | Yes | Yes | Yes |
| | Node 2 Switch Room | Yes | No | Yes |
| | DG 2K10 Enclosure Building | No | No | Yes |
| | Mount Nebo Radio House | Yes | Yes | Yes |
| | SPDS Computer Room – Turbine Deck | Yes | Yes | Yes |
| | GSB Communications Room - 3 rd Floor | Yes | Yes | Yes |
| | Turbine Building -2 nd Floor | Yes | Yes | Yes |
| | Auxiliary Building – 2 nd Floor | Yes | Yes | Yes |
| | Adm. Building Radio Room – 2 nd Floor | Yes | Yes | Yes |
| | Adm. Building – 3 rd Floor (TSC) | Yes | Yes | Yes |