



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

June 3, 2013

Mr. Thomas Joyce  
President and Chief Nuclear Officer  
PSEG Nuclear LLC  
P.O. Box 236, N09  
Hancocks Bridge, NJ 08038

**SUBJECT: HOPE CREEK GENERATING STATION AND SALEM NUCLEAR  
GENERATING STATION, UNIT NOS. 1 AND 2 – STAFF ASSESSMENT IN  
RESPONSE TO REQUEST FOR INFORMATION PURSUANT TO 10 CFR  
50.54(f) - RECOMMENDATION 9.3 COMMUNICATIONS ASSESSMENT  
(TAC NOS. ME9959, ME9984, AND ME9985)**

Dear Mr. Joyce:

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information pursuant to Section 50.54(f) to Title 10 of the *Code of Federal Regulations* (henceforth referred to as the 50.54(f) letter). The request was part of implementing lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 5 to the 50.54(f) letter contained specific requested information associated with the NRC's Near-Term Task Force Recommendation 9.3 for emergency preparedness communications. Specifically, the letter requested that licensees provide an assessment of the current communications systems and equipment used during an emergency event.

By letter dated October 31, 2012 (ADAMS Accession No. ML12306A249), PSEG Nuclear, LLC (the licensee) responded to this request for the Hope Creek Generating Station (Hope Creek) and Salem Nuclear Generating Station, Units 1 and 2 (Salem). Generic technical concerns were issued by the NRC in a letter dated January 23, 2013 (ADAMS Accession No. ML13010A162). The licensee supplemented its response in a letter dated February 21, 2013 (ADAMS Accession No. ML13053A072).

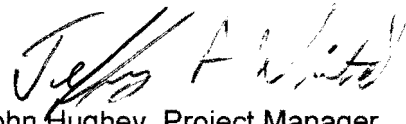
The NRC staff has reviewed the communications assessments for Hope Creek and Salem and, as documented in the enclosed safety assessment, determined that the assessment for communications is reasonable, and the interim measures, analyzed existing systems, and proposed enhancements will help to ensure that communications are maintained. Further, in coordination with the Near-Term Task Force Recommendation 4.2 (mitigating strategies), NRC staff plans to follow up with the licensee to confirm that upgrades to the site's communications systems have been completed.

T. Joyce

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If you have any questions, please contact me at (301) 415-3204 or via email at [john.hughey@nrc.gov](mailto:john.hughey@nrc.gov).

Sincerely,

  
for John Hughey, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-354, 50-272, and 50-311

Enclosure:  
As stated

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ASSESSMENT OF COMMUNICATIONS IN RESPONSE TO

REQUEST FOR INFORMATION DATED MARCH 12, 2012

PUBLIC SERVICE ENTERPRISE GROUP NUCLEAR, LLC

HOPE CREEK GENERATING STATION

SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-354, 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated March 12, 2012,<sup>1</sup> the U.S. Nuclear Regulatory Commission (NRC) issued a request for information pursuant to Section 50.54(f) to Title 10 of the *Code of Federal Regulations* (10 CFR) (henceforth referred to as the 50.54(f) letter). The request was issued as a part of implementing lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 5 to the 50.54(f) letter contained specific requested information associated with the NRC's Near-Term Task Force Recommendation 9.3 for emergency preparedness communications. Specifically, the letter requested that licensees provide an assessment of the current communications system and equipment used during an emergency event.

By letter dated October 31, 2012,<sup>2</sup> PSEG Nuclear, LLC (the licensee), provided an assessment of its communications capabilities for the Hope Creek Generating Station (Hope Creek) and Salem Nuclear Generating Station, Units 1 and 2 (Salem), in response to the NRC's request for information.

Within the licensee response letter, an assessment of the current communications systems and equipment to be used during an emergency event was performed to identify any enhancements needed to ensure communications are maintained during and following a beyond design-basis large-scale natural event. In this assessment, it was assumed that a large-scale natural event causes: (1) a loss of all alternating current (ac) power; and (2) extensive damage to normal and emergency communications systems both onsite and in the area surrounding the site (i.e., within 25 miles of the site, consistent with the guidance endorsed by NRC's letter dated May 15, 2012<sup>3</sup>). Additionally, by letter dated June 7, 2012,<sup>4</sup> interim actions were identified by the

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<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340.

<sup>2</sup> ADAMS Accession No. ML12306A249.

<sup>3</sup> ADAMS Accession No. ML12131A043.

<sup>4</sup> ADAMS Accession No. ML12160A296.

licensee during the period of implementation of the planned improvements to the communications systems or procedures.

### 1.1 Background

On March 12, 2012,<sup>5</sup> the NRC issued a letter 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." In accordance with 10 CFR 50.54(f), addressees were requested to submit a written response to the information requests within 90 days.

The 50.54(f) letter stated that if an addressee could not meet the requested response date, then the addressee must respond within 60 days of the date of the letter, and describe the alternative course of action that it proposes to take, including any estimated completion date. By letter dated May 10, 2012,<sup>6</sup> the licensee committed to submitting its completed communications assessment and implementation schedule by October 31, 2012. By letter dated June 7, 2012,<sup>7</sup> the licensee also provided its description of any interim actions (discussed in further detail in Section 3.0 of this Safety Assessment) that have been taken or are planned to be taken to enhance existing communications systems power supplies until the communications assessment and the resulting actions are complete. The NRC staff found the proposed schedule acceptable by letter dated July 26, 2012.<sup>8</sup>

Enclosure 5 of the 50.54(f) letter contained specific requested information associated with NRC's Near-Term Task Force Recommendation 9.3 for emergency preparedness communications. Specifically, the letter requested that licensees provide an assessment of the current communications systems and equipment used during an emergency event to identify any enhancements that may be needed to ensure communications are maintained during a large-scale natural event and subsequent loss of ac power. The licensee's assessment should:

- identify any planned or potential improvements to existing onsite communications systems and their required normal and/or backup power supplies;
- identify any planned or potential improvements to existing offsite communications systems and their required normal and/or backup power supplies;
- provide a description of any new communications system(s) or technologies that will be deployed based upon a large-scale natural event and damage to communications systems onsite and offsite; and
- provide a description of how the new and/or improved systems and power supplies will be able to provide for communications during a loss of all ac power.

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<sup>5</sup> ADAMS Accession No. ML12053A340.

<sup>6</sup> ADAMS Accession No. ML12131A679.

<sup>7</sup> ADAMS Accession No. ML12160A296.

<sup>8</sup> ADAMS Accession No. ML12200A106.

The 50.54(f) letter also asked for licensees to:

- describe any interim actions that have been taken or are planned to be taken to enhance existing communications systems power supplies until the communications assessment and the resulting actions are complete; and
- provide a schedule of the time needed to implement the results of the communications assessment.

## 2.0 REGULATORY EVALUATION

The NRC staff reviewed the licensee's responses to the 50.54(f) letter against the regulations and guidance described below.

### 2.1 Regulations

Section 50.47, "Emergency plans," to 10 CFR Part 50, sets forth emergency plan requirements for nuclear power plant facilities.

Section 50.47(b) establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency. Planning Standard (6) of this section requires that a licensee's emergency response plan contain provisions for communications among response organizations to emergency personnel and the public. Planning Standard (8) requires that the design should include adequate emergency facilities and equipment to support emergency response.

Section IV.D, "Notification Procedures," of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, requires that a licensee have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency. The design objective of the alert and notification system shall be to have the capability to complete the alerting and initiate notification of the public within the plume exposure pathway within approximately 15 minutes. This alerting and notification capability will include a backup method of public alerting and notification.

Section IV.E, "Emergency Facilities and Equipment," of Appendix E, to 10 CFR Part 50, states that adequate provisions will be made and described for emergency facilities including at least one onsite and one offsite communications system; and each system shall have a backup power source. These arrangements will include:

- a. Provision for communications with contiguous State/local governments within the plume exposure pathway emergency planning zone.
- b. Provision for communications with Federal emergency response organizations.
- c. Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility; and among the nuclear

facility, the principal State and local emergency operations centers, and the field assessment teams.

- d. Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility.

## 2.2 Guidance

Nuclear Energy Institute (NEI) 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communication Capabilities,"<sup>9</sup> dated May 2012, presents a methodology for licensees to analyze their ability to perform critical communications during and after a large-scale natural event. By letter dated May 15, 2012,<sup>10</sup> the NRC staff reviewed NEI 12-01 and determined that it was an acceptable method for licensees to use in responding to the 50.54(f) letter.

The NRC staff reviewed the licensees' analyses against the assumptions and guidance within NEI 12-01, Sections 2.2, 2.4 and 4. These sections provide a discussion on the assumptions and criteria to be used for a communications assessment.

## 3.0 TECHNICAL EVALUATION

In its letter dated October 31, 2012, the licensee submitted its assessment of communications assuming a large-scale natural event, which would lead to an extended loss of all ac power. This letter included a discussion of required communications links, primary and backup methods of communications, and any identified improvements.

On January 23, 2013,<sup>11</sup> the NRC staff sent a letter to all operating reactor licensees requesting that eight generic technical issues, derived from NEI 12-01, be analyzed for applicability to its Communications Assessments. By letter dated February 21, 2013,<sup>12</sup> the licensee submitted supplemental information to its October 31, 2012, communications response, which the NRC staff reviewed as part of this evaluation.

### 3.1 Communication Areas Reviewed

#### 3.1.1 Communication Links

Hope Creek and Salem currently have communications capabilities with offsite response organizations (OROs), the NRC, between licensee emergency response facilities, with field and offsite monitoring teams, and with in-plant and offsite licensee emergency response organization staff. As part of its communications assessment, the licensee has determined that some existing communications system equipment,<sup>13</sup> such as satellite telephones and radio systems (able to communicate radio-to-radio), would be available after implementation of

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<sup>9</sup> ADAMS Accession No. ML12125A412.

<sup>10</sup> ADAMS Accession No. ML12131A043.

<sup>11</sup> ADAMS Accession No. ML13010A162.

<sup>12</sup> ADAMS Accession No. ML13053A072.

<sup>13</sup> Sound powered phones are also expected to be partially available for use for onsite communications.

planned enhancements, for certain communication links listed above given a seismic, high wind, or flooding event. This was determined by ensuring that the final location of the equipment will be located in safety-related structures or consistent with criteria contained within NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide." This FLEX criteria provides reasonable protectiveness per NEI 12-01.

As an interim measure prior to the implementation of all planned enhancements, the licensee is utilizing existing site communication systems, including existing radios and satellite telephones. Portable generators were purchased for charging satellite phone batteries and radio chargers. This equipment will be used as an interim measure, and these communication systems will be further enhanced as part the implementation of the communication assessment results (e.g., purchasing more satellite phones and enhancing the handheld radio power supplies). The current protectiveness of the satellite phones and the radio system is based on analyses of safety-related structures and emergency response facilities.

As the planned enhancement, the licensee has a schedule for ensuring that radios and/or satellite telephones for each communication link outlined in Section 4 of NEI 12-01 is available. As part of its planned enhancements for the satellite phones, the licensee is purchasing and installing additional satellite phones and associated batteries. As part of its planned enhancements for the site radios, the licensee is evaluating repowering the system with backup power supplies through FLEX, and is providing portable radio battery capabilities for 24 hours of operations. The licensee also confirmed that satellite phones can be used for communications at State and County offsite response organizations.<sup>14</sup> The licensee will complete these enhancements in phases, ranging from purchasing new radio batteries and associated charging racks by the third quarter of calendar year (CY) 2013, to installing satellite phone base units and associated training by the second quarter of CY 2014.

The NRC staff has reviewed the licensee's expected communications links within their communications assessment. In reviewing their submittal, the NRC staff considered whether it is reasonable that each communication link can be maintained, after the implementation of all planned enhancements, in accordance with the NRC-endorsed guidance of NEI 12-01. The satellite telephones are expected to help maintain communications offsite of the plant due to their ability to function without installed infrastructure. The radios will help ensure communications onsite due to their ability to communicate radio-to-radio in conjunction with enhanced power supplies. The NRC staff concludes that since the licensee's assessment for the availability of communications systems is reasonable, and planned enhancements are to be made for communications areas to help ensure availability, the licensee's interim measures and proposed enhancements will help to ensure that communications are maintained consistent with the assumptions in NRC-endorsed guidance of NEI 12-01.

### 3.1.2 Equipment Location

Hope Creek and Salem have analyzed the survivability of their communications equipment for large-scale natural events by analyzing the storage of their communications equipment in safety-related structures (e.g., seismic class I) and planning to store their communications equipment in accordance with FLEX criteria. The generators and fuel that will be used to

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<sup>14</sup> HAM radios are being evaluated as a backup communication method to satellite phones for communications with the offsite response organizations.

support the interim measures and/or planned enhancements, will also be stored in alignment with FLEX criteria. The licensee is planning on providing bi-annual status reports to the NRC on the status of communications improvements. The licensee's final storage locations of communications equipment will be completed in alignment with their FLEX implementation.

NRC staff reviewed the licensee's submittal and verified that the licensee has considered the equipment location and protection contained within the NRC endorsed guidance of NEI 12-01. The NRC staff also verified that all equipment discussed in Section 3.1.1 of this document has been analyzed to be stored in a reasonably protected area from seismic, flooding, and high wind events as discussed in NEI 12-01. The NRC staff also ensured that ancillary equipment, such as generators also would be protected from seismic, flooding, and high wind events.

Based on this review, the NRC staff considers the licensee's analysis of communications assessment equipment survivability and proposed enhancements for equipment location to be consistent with NRC endorsed guidance NEI 12-01. This determination of equipment protection, support the conclusion that these measures will help to ensure communications equipment availability for a large-scale natural event.

### 3.1.3 Equipment Power and Fuel

Hope Creek and Salem have analyzed the availability of their communications system power supplies following the loss of all ac power. The licensee has proposed a combination of batteries, and generators to power site communications equipment, including the satellite phones, and radios, and will have extra batteries for this equipment. The site strategies will result in: (1) each satellite phone having a sufficient battery supply to operate the phone for 24 hours; (2) each handheld radio having a sufficient battery supply to operate the radio for 24 hours; (3) the radio system repeaters will be evaluated in alignment with FLEX for backup power sources; and (4) portable pumps being available to fuel FLEX generators from existing site sources. It is expected that this equipment has power to support communications for a minimum of 24 hours, based on assumptions for impeded site access. The licensee is planning on having these enhancements to the communication system power supplies completed in alignment with FLEX; and extra batteries for site radios and satellite phones will be procured by the third quarter of CY 2013.

The NRC staff has reviewed the licensee's communications assessment power supplies. In reviewing their submittal, the NRC staff finds it reasonable that power for the existing equipment and proposed enhancement equipment, as listed in Section 3.1.1 of this document, would remain available for a 24-hour duration, based on the availability of extra batteries, uninterruptible power supplies, and planned modification to backup power supplies. Additionally, the licensee's proposed enhancement is in accordance with NRC-endorsed guidance of NEI 12-01.

Based on this review, the NRC staff considers the licensee's analysis of equipment power and proposed enhancements for equipment power to be consistent with NRC endorsed guidance NEI 12-01. This determination of available equipment power, support the conclusion that these measures will help to ensure communications equipment functionality for a large-scale natural event.



### 3.1.4 Proceduralization and Training

Hope Creek and Salem have confirmed that there will be sufficient reserves of equipment to minimize the need of multi-use equipment for different communication functions. Existing site procedures to ensure availability and reliability for communications equipment, including their maintenance, inspection, and inventories will be modified for the planned enhancements discussed in Section 3.1.1. Updates to existing procedures and training for the satellite phones will be completed by the second quarter of CY 2014. Other training will be completed in alignment with FLEX (such as manual actions for the use of the portable generators).

Notification of plant employees of an event is accomplished via the public address system (which has a battery backup power supply). The licensee has procedures in place for emergency response organization staff self-activation due to major degradation of the electrical grid. These site capabilities will activate the offsite emergency response organization and notify plant staff.

The NRC staff reviewed the licensee's commitments on the planned quality assurance, maintenance, and staff training on the use of this equipment. The NRC staff determined that the licensee's submittal is in accordance with the NRC-endorsed guidance of NEI 12-01.

Based on this review, the NRC staff considers the licensee's planned proceduralization of equipment use and licensee staff training to be consistent with NRC endorsed guidance, NEI 12-01. This determination of equipment availability and functionality, support the conclusion that these measures will help to ensure communications equipment functionality for a large-scale natural event.

### 3.2 Regulatory Commitments

The licensee's regulatory commitments were provided in Attachment 2 of its submission dated October 31, 2012, in response to the 50.54(f) letter, and are listed below:

| Commitment   | Committed Date or Milestone   | Commitment Type          |                       |
|--|---|--------------------------|-----------------------|
|  |   | One-Time Action (Yes/No) | Programmatic (Yes/No) |
| PSEG will finalize an implementation plan for communications system improvements   | February 28, 2013   | Yes                      | No                    |
| Implementation of communications system improvements will be integrated into actions necessary to achieve full compliance with NRC Order Number EA-12- | Salem Unit 1 – prior to startup from Refueling Outage (RFO) 23 in Fall 2014 | Yes                      | No                    |
|  | Hope Creek – prior to startup from RFO 19 in Spring 2015                    | Yes                      | No                    |

|   |   |     |    |
|---|---|-----|----|
| 049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events | Salem Unit 2 – prior to start up from RFO 21 in Fall 2015 | Yes | No |
|---|---|-----|----|

The NRC staff's review did not rely on the regulatory commitments made for determination of the acceptability of the licensee's communications assessment and the interim measures, analyzed existing systems, and proposed enhancements for the site.

#### 4.0 CONCLUSION

The NRC staff has reviewed the licensee's communications assessment for communications with or among: offsite response organizations, NRC, licensee emergency response facilities, field and offsite monitoring teams, and on-site and in-plant response teams. In reviewing their submittal, the NRC staff considered a number of factors, outlined above, and determined that their assessment of existing equipment, proposed enhancements and interim actions was in accordance with the NRC-endorsed guidance of NEI 12-01. The NRC staff concludes that the licensee's assessment for communications is reasonable, and the licensee's interim measures and proposed enhancements will help to ensure that communications are maintained. Further, in coordination with the Near-Term Task Force Recommendation 4.2 (mitigating strategies), the NRC staff plans to follow up with the licensee to confirm that upgrades to the site's communications systems have been completed.

Principal Contributor: R. Chang, NSIR

Dated: June 3, 2013

T. Joyce

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If you have any questions, please contact me at (301) 415-3204 or via email at [john.hughey@nrc.gov](mailto:john.hughey@nrc.gov).

Sincerely,

*/ra/ (JWhited for)*

John Hughey, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-354, 50-272, and 50-311

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