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

September 26, 2017

Mr. George Lippard III
Vice President, Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88, Mail Code 800
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – SAFETY ASSESSMENT OF RESPONSE TO INFORMATION REQUEST PURSUANT TO 10 CFR 50.54(f) - RECOMMENDATION 9.3 OF THE NEAR-TERM TASK FORCE, COMMUNICATIONS ASSESSMENT

Dear Mr. Lippard:

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 Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.54(f), regarding Recommendations 2.1 (seismic and flooding evaluations), 2.3 (seismic and flooding walkdowns), and 9.3 (emergency preparedness communication and staffing) of the Near-Term Task Force (NTTF) review of insights from the Fukushima Dai-ichi accident. With respect to NTTF Recommendation 9.3, Enclosure 5 to the NRC's letter requested licensees and holders of construction permits to assess their means to power communications equipment onsite and offsite during a prolonged station blackout event and to perform a staffing study to determine the staff required to fill all necessary positions in response to a multi-unit event.

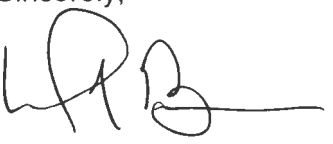
By letter dated October 30, 2012 (ADAMS Accession No. ML12307A032), South Carolina Electric & Gas Company (SCE&G, the licensee) responded to this request for Virgil C. Summer Nuclear Station, Unit 1 (VCSNS) with regard to communications capabilities. The NRC staff issued a letter dated January 23, 2013 (ADAMS Accession No. ML13010A162), to licensees and holders of construction permits to identify eight generic technical issues for resolution. The licensee supplemented its response to address these generic technical issues by letter dated February 21, 2013 (ADAMS Accession No. ML13057A111).

The NRC staff reviewed the communications assessment for VCSNS. Additionally, between July 13, 2015, and July 17, 2015, the NRC staff conducted an audit at the VCSNS site related to the licensee's mitigation strategies developed in response to NRC Order EA-12-049, "Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events [BDBEE]" (ADAMS Accession No. ML12054A736). As part of this audit, the NRC staff confirmed and reviewed updated information related to the implementation of the identified communication equipment. By letter dated October 31, 2016, the licensee submitted its report of full compliance with Order EA-12-049 and its Final Integrated Plan (FIP) (ADAMS Accession No. ML16307A390). The enclosed safety assessment documents the NRC staff's review of the VCSNS communications assessment submittals, as well as updated information

from the July 2015 audit and related information provided in the FIP. The NRC staff determined that the VCSNS assessment for communications is reasonable, and the analyzed existing systems and documented enhancements will help to ensure that communications are maintained following a BDBEE and an extended loss of alternating current power. As part of the review of licensees' mitigation strategies in response to Order EA-12-049, the NRC staff will verify that upgrades to the site's communications systems have been completed through the inspection program.

If you have any questions, please contact Stephen Philpott at (301) 415-2365.

Sincerely,



Tony Brown, Acting Chief
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosure:
Safety Assessment

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SAFETY ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ASSESSMENT OF COMMUNICATIONS IN RESPONSE TO

REQUEST FOR INFORMATION DATED MARCH 12, 2012

SOUTH CAROLINA ELECTRIC & GAS

VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1

DOCKET NO. 50-395

1.0 INTRODUCTION

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 Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.54(f) (hereafter referred to as the 50.54(f) letter), regarding Recommendations 2.1 (seismic and flooding evaluations), 2.3 (seismic and flooding walkdowns), and 9.3 (emergency preparedness communication and staffing) of the Near-Term Task Force (NTTF) review of insights from the Fukushima Dai-ichi accident. With respect to Recommendation 9.3, Enclosure 5 to the NRC's letter requested licensees and holders of construction permits to assess their means to power communications equipment onsite and offsite during a prolonged station blackout (SBO) event and to perform a staffing assessment to determine the staff required to fill all necessary positions in response to a multi-unit event.

By letter dated October 30, 2012 (ADAMS Accession No. ML12307A032), South Carolina Electric & Gas Company (SCE&G, the licensee) responded to this request for Virgil C. Summer Nuclear Station, Unit 1 (VCSNS, V.C. Summer) and provided an assessment of its communications capabilities. The NRC staff issued a letter dated January 23, 2013 (ADAMS Accession No. ML13010A162), to licensees and holders of construction permits to identify eight generic technical issues for resolution. The licensee supplemented its response to address these generic technical issues by its letter dated February 21, 2013 (ADAMS Accession No. ML13057A111). Additionally, between July 13, 2015, and July 17, 2015, the NRC staff conducted an audit at the VCSNS site related to the licensee's mitigation strategies developed in response to NRC Order EA-12-049, "Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events [BDBEE]" (ADAMS Accession No. ML12054A736). As part of this audit, the NRC staff confirmed and reviewed updated information related to the implementation of the identified communication equipment. By letter dated October 31, 2016, the licensee submitted its report of full compliance with Order EA-12-049 and its Final Integrated Plan (FIP) (ADAMS Accession No. ML16307A390).

The licensee performed an assessment of the communications systems and equipment to be used during an emergency event to identify any enhancements needed to ensure communications are maintained during and following a beyond-design-basis large-scale natural event. This assessment was based on the assumption 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 May 15, 2012,

letter[1]). Additionally, by letter dated June 8, 2012 (ADAMS Accession No. ML12164A380), the licensee described interim actions to enhance existing communications systems that were implemented prior to the completion of the communications assessment and the resulting improvements to the communications systems or procedures. Finally, the licensee's FIP summarizes the enhanced communications equipment and the procedures used to maintain or restore communications during a BDBEE.

1.1 Background

Enclosure 5 of the 50.54(f) letter contained specific requested information associated with NRC's NTTF 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.

The 50.54(f) letter also asked licensees to:

- describe any interim actions that were taken or planned to enhance existing communications systems power supplies until the communications assessment and the resulting actions were 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

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[1] Skeen, D. L., U.S. Nuclear Regulatory Commission, letter to Susan Perkins-Grew, Nuclear Energy Institute, "U.S. Nuclear Regulatory Commission Review of NEI 12-01, 'Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities,' Revision 0, dated May 2012" (ADAMS Accession No. ML12131A043).

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 adequate emergency facilities and equipment to support emergency response are provided and maintained.

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 prompt public alert and notification system shall have the capability to complete the alerting and initiate notification of the public within the plume exposure pathway within about 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 shall 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) guidance document NEI 12-01, Revision 0, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," dated May 2012 (ADAMS Accession No. ML12125A412), presents a methodology for licensees to analyze their ability to perform critical communications during and after a large-scale natural event. The NRC staff reviewed NEI 12-01, and determined that it was an acceptable method for licensees to use in responding to the March 12, 2012, 50.54(f) letter regarding NTTF Recommendation 9.3, as stated in its letter dated May 15, 2012 (ADAMS Accession No. ML12131A043).

The NRC staff reviewed the licensee's 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 October 30, 2012, letter, the licensee submitted its assessment of communications assuming a large-scale natural event leading 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. The NRC staff also reviewed the

supplemental information submitted by the licensee in its letter dated February 21, 2013. The licensee's FIP, submitted by letter dated October 31, 2016, also summarizes the VCSNS enhanced communications capabilities and procedures to maintain or restore communications following a BDBEE and extended loss of all ac power.

3.1 Communication Areas Reviewed

3.1.1 Communication Links

V.C. Summer currently has communications capabilities with offsite response organizations, 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 determined that certain communications system equipment such as satellite phones and radios[2] will be available with the completed enhancements, for these communication links given a seismic, high wind, or flooding event. This was determined by evaluating the location of the equipment against seismic loads, or criteria contained within NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0 dated August 2012 (ADAMS Accession No. ML12242A378). Guidance document NEI 12-01 refers to this FLEX criteria as appropriate guidance for equipment location requirements to maximize survivability following a BDBEE.

As an initial interim measure, the licensee purchased additional supplies of satellite phones for the site, as well as batteries, portable generators, and a portable radio tower with repeaters and onboard generator. Training was implemented to help ensure the availability of the interim measures by providing for the setup and operation of this equipment. The FIP summarizes how this additional communication equipment will be used to reestablish radio communications onsite for emergency response if a BDBEE results in the loss of normal plant communication systems.

As stated in its FIP, the licensee has two plant radio systems to facilitate radio communications onsite and describes their redundancy and backup power supplies. As an enhancement, the licensee implemented a procedure to use satellite phones, radios, and the portable radio tower with repeaters to ensure that radio communications and/or satellite phones will be maintained for each communication link outlined in Section 4 of NEI 12-01. The licensee also analyzed for communications with offsite response organizations. The licensee's FIP states that 16 portable battery-powered satellite phones, with spare batteries and recharging stations, will be used for on-site and off-site communications.

The NRC staff has reviewed the licensee's expected communications links described in the communications assessment and the FIP. In reviewing the licensee's submittals, the NRC staff considered whether it is reasonable that each communication link can be maintained in accordance with the NRC-endorsed guidance of NEI 12-01. The radios will help ensure communications onsite with the addition of the portable radio tower and radio repeaters. The satellite telephones are expected to maintain communications with the NRC and other offsite contacts, and to provide a backup onsite communications capability in addition to the radios. The NRC staff concludes that the licensee's assessment for the availability of communications systems is reasonable, and the implemented enhancements should help to ensure that

[2] Private branch exchange telephones are expected to also be available for use following a large-scale natural event for communications between licensee emergency response facilities.

communications are maintained consistent with the assumptions in the NRC-endorsed guidance of NEI 12-01.

3.1.2 Equipment Location

V.C. Summer has analyzed the survivability of their communications equipment for large-scale natural events by storing their portable communications equipment in accordance with FLEX criteria. This FLEX criteria was also used to determine storage locations for ancillary equipment, such as the fuel, generators, and battery chargers, needed to support the use of satellite phones and the enhanced radio systems. In order to meet this FLEX criteria, the licensee built a new emergency response building (ERB), where this additional communications equipment is stored. The ERB is designed to protect the equipment from the applicable seismic, flooding, and high wind events, as discussed in NEI 12-01. The licensee's FIP states that the ERB is not designed to fully protect against tornado winds nor associated missiles. To provide for protection of equipment needed to implement the proposed mitigation strategies against tornado winds and missiles, the licensee credited the separation between the two storage buildings housing the mitigation strategies equipment. Similarly, separation between the multiple sets of radio communication equipment (the two plant radio systems and the backup portable radio tower kept in the ERB) reduces the likelihood of having a single tornado event affect all communications equipment locations.

The NRC staff reviewed the licensee's submittals and verified that the licensee has considered the equipment location and protection criteria contained within the guidance of NEI 12-01. The NRC staff also verified that all equipment discussed in Section 3.1.1 of this safety assessment has been analyzed to be available after a large-scale natural event or would be stored in a reasonably protected area from seismic, flooding, and high wind events (considering the separation for tornado winds and associated missiles, as stated in the previous paragraph) as discussed in NEI 12-01. The NRC staff also noted that ancillary equipment, such as generators and fuel supplies also would be protected from seismic, flooding, and high wind events.

Based on this review, the NRC staff considers the licensee's assessment and enhancements to communications equipment survivability and location to be consistent with the NRC-endorsed guidance of NEI 12-01. Therefore, the NRC staff concludes that these measures should help to ensure communications equipment availability following a large-scale natural event.

3.1.3 Equipment Power and Fuel

V.C. Summer has analyzed the availability of their communications system power supplies following the loss of all ac power. The licensee uses a combination of batteries and generators to power site communications equipment, including the satellite phones, radios, and radio towers. The site strategies result in: (1) each satellite phone having a 24 hour power supply capability through a combination of spare batteries and chargers; (2) radios having a 24 hour power supply capability through a combination of spare batteries and chargers; and 3) portable generators to energize battery chargers available for at least 24 hours. It is expected that this equipment has power to support communications for a minimum of 24 hours, based on assumptions for impeded site access and the availability of additional equipment from offsite after 24 hours.

The NRC staff has reviewed the licensee's communications assessment with regard to power supplies. In reviewing their submittals, the NRC staff finds it reasonable that power for the

enhanced equipment, as listed in Section 3.1.1 of this safety assessment, would remain available for a 24-hour duration, based on the availability of extra batteries, battery chargers, and backup power supplies. Additionally, the licensee's communication system enhancements are in accordance with the NRC-endorsed guidance of NEI 12-01.

Based on this review, the staff considers the licensee's analysis of communications equipment power supplies to be consistent with the NRC-endorsed guidance of NEI 12-01. Therefore, the NRC staff concludes that these measures should help to ensure available equipment power, and therefor communications equipment functionality following a large-scale natural event.

3.1.4 Procedures and Training

In V.C. Summer's supplemental response to address the generic technical issues, the licensee confirmed that training and procedures for the setup and use of the portable radio tower are complete. Procedures for the maintenance and operability testing of the portable radio tower and radios to ensure functionality are in place, and have been modified for portable satellite phones. Portable generators are included in the station's preventative maintenance program in accordance with FLEX criteria. Initial training for the use and deployment of the portable radio tower is complete, and training on the use of the satellite phones is covered under drills and exercises.

Procedures are in place for notification of an event to plant employees via a plant paging system. The licensee also has procedures in place for emergency response organization staff self-activation due to large-scale natural events. These existing site procedures will activate the offsite emergency response organization and notify plant staff.

The NRC staff reviewed the licensee's discussion on the quality assurance and maintenance of the equipment and licensee 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 staff considers the licensee's implementation of procedures for equipment use and notification, and the associated staff training to be consistent with NRC-endorsed guidance of NEI 12-01. Therefore, these measures should help to ensure communications equipment functionality following a large-scale natural event.

4.0 CONCLUSION

The NRC staff has reviewed the licensee's assessment for communications with or among: offsite response organizations, the NRC, licensee emergency response facilities, field and offsite monitoring teams, and on-site and in-plant response teams. In reviewing the submittals, the NRC staff considered a number of factors, outlined above, and determined that the licensee's assessment, with the implemented enhancements, 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 enhancements implemented should help to ensure that communications are maintained. The NRC staff will verify the completion of the stated enhancements and procedures as part of its inspection to confirm the licensee's implementation of mitigating strategies and compliance with Order EA-12-049.

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – SAFETY ASSESSMENT OF RESPONSE TO INFORMATION REQUEST PURSUANT TO 10 CFR 50.54(f) - RECOMMENDATION 9.3 OF THE NEAR-TERM TASK FORCE, COMMUNICATIONS ASSESSMENT DATED SEPTEMBER 26, 2017

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