



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

March 25, 2011

Mr. Thomas D. Gatlin
Vice President, Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1-REQUEST FOR
ADDITIONAL INFORMATION (RAI) ON SURVEILLANCE REQUIREMENTS
(TAC NO. ME5011)

Dear Mr. Gatlin:

By letter dated November 11, 2010, South Carolina Electric and Gas Company submitted a license amendment request for U.S. Nuclear Regulatory Commission (NRC) review that would revise the Technical Specification surveillance requirements for the emergency diesel generators. The NRC staff has determined that additional information is required as addressed in the enclosure.

We request that a response be provided within 30 days of the date of this letter.

Sincerely,

A handwritten signature in black ink that reads "Robert E. Martin".

Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosure:
RAI

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REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE LICENSE AMENDMENT REQUEST TO CHANGE
EMERGENCY DIESEL GENERATOR SURVEILLANCE REQUIREMENTS
FOR VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

By letter dated November 11, 2010 (Agencywide Documents Access and Management System, (ADAMS), ML103190756), the South Carolina Electric and Gas Company (SCE&G) submitted a request to revise the Technical Specifications (TSs), in Appendix A to Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit No. 1 (VCSNS). The changes would modify the TS Surveillance Requirements (SRs) by providing surveillance enhancements that will improve operation and testing of the emergency diesel generators (EDG) and to provide a more restrictive voltage and frequency band for operation when not connected in parallel with the offsite sources. The following questions were developed as a result of the U.S. Nuclear Regulatory Commission (NRC) staffs review of the license amendment request (LAR) for proposed changes to SR 3/4.8.1, alternating current (AC) SOURCES—OPERATING.

1. The LAR proposes to change SR 4.8.1.1.2.a.3 to raise the minimum allowable EDG bus voltage from 6480 volts to 6511 volts. The allowable frequency range for this SR is 58.8 to 61.2 Hz. The LAR states that this change is required to ensure compliance with minimum acceptable voltage for equipment operability. Final Safety Analysis Report (FSAR), Section 8.3.1.1.2 states that each 7.2 Kv bus has 3 degraded voltage relays set at approximately 91.34% (6576 Volts) of the nominal bus voltage level. The degraded voltage relay setpoint is typically based on minimum voltage required for equipment operability.
 - a) Provide excerpts from calculations establishing the limiting voltage for equipment operability.
 - b) Verify that the degraded voltage relay does not have to be reset when the EDG is supplying plant loads.
 - c) Verify that equipment required for plant shutdown will perform within the design bases assumed for accident analyses when the EDG is operating at the lowest allowable frequency.
 - d) Provide a summary of the change in each EDG loading when the EDG is operating at the extreme ends of the allowable voltage and frequency.
 - e) Provide a summary of instrument inaccuracies assumed in establishing the allowable voltage and frequency.
2. The LAR proposes to change SR 4.8.1.1.2.a.4 to expand the load range from 4150 kilowatt (kW) - 4250 kW to between 3825 kW - 4250 kW. This corresponds to the load range recommended in Regulatory Guide (RG) 1.9, Revision 3, of 90 percent to 100 percent of the continuously rated load. It should be noted that the RG 1.9, Revision 3, recommendation of testing at 90 percent to 100 percent of the rating of the EDG is based on the premise that there is a 10 to 15 percent difference between the EDG rating and the maximum postulated

Enclosure

EDG loading. The LAR also states EDG testing is required to assure that the EDG retains the capability to perform its design function under the worst postulated conditions.

- a) Provide relevant excerpts from various EDG loading calculations which show that adequate margin exists between the various EDG ratings, as listed in the VCSNS Final Safety Analysis Report (FSAR) and the various worst case loading profiles.
 - b) Describe how the margins will be impacted at the higher end of the voltages and frequencies as proposed in the LAR.
 - c) Provide details on manual loads that are procedurally added during a postulated event.
3. A new note is proposed at the bottom of page 3/4 8-3 to allow testing at a power factor (PF) other than 0.9 if grid conditions do not permit testing at the proposed PF. The plant bus voltages can vary significantly over a 24-hour period depending on grid load conditions. Testing can be scheduled for an optimum time of the day based on operating experience.
- a) Provide details on the average load PF of the EDG loads during the postulated accident conditions.
 - b) Provide a summary of procedural guidance for EDG tests that require verification of PF. The guidance should provide assurance that the planned testing will be performed at an optimum time for the PF to be maintained close to the required test value.
4. SR 4.8.1.1.2.f.2 is proposed to be deleted on the premise that it is not required by RG 1.9 Revision 3. The intent of RG 1.9, Revision 3, was not to delete the load test but to substitute the fast start for the monthly slow start followed by loading the EDG to the required value. This position is clarified in RG 1.9, Revision 4, Section 2.3.2.2. Confirm that the fast start SR will be followed by the loading requirements and frequency and voltage will be verified to be within the allowable range.
5. SR 4.8.1.1.2.g.2 is proposed to be revised to include a PF limit as well as to provide a revised frequency limit of 63 Hz and a time requirement of 3 seconds to establish steady state frequency and voltage conditions during step load increases. RG 1.9, Revision 3, Section 1, "Design Considerations," provides guidance on acceptable voltage and frequency deviations during load sequencing and load rejection tests.
- a) Verify that the proposed parameters in the SR satisfy the RG 1.9, Revision 3, recommendations for voltage and frequency recovery for all loads and that these parameters are verified during fast start testing and auto load sequencing.
 - b) Confirm that the largest single load on the EDG is less than or equal to 729 kW with the EDG operating at the maximum allowable voltage and frequency range.
6. SR 4.8.1.1.2.g.3 is proposed to change the lower limit for a load rejection test to a minimum of 3825 kW. Provide justification for the lower limit given that the FSAR Table 8.3-3 provides much higher calculated loading.

7. SR 4.8.1.1.2.g.7 is proposed to be revised to change the range of EDG loading for the 2-hour and 22-hour testing periods. The change also proposes that the 2-hour overload test be performed anytime during the 24-hour run instead of the first 2 hours. The intent of this SR is to demonstrate the capability of the EDG to supply safe shutdown loads during the initial conditions of a design basis event, when the pumps may be operating under run-out conditions and the EDG has to operate in overload range, and during extended steady state conditions for mitigating the consequences of a design basis accident.
 - a) Provide a summary of the calculated loading profile expected during the first 24 hours of the worst case design basis accident.
 - b) Verify that the proposed testing sequence will envelope the postulated accident profile.
8. New SR 4.8.1.1.2.g.15 is proposed to replace 4.8.1.1.2.g.6.c for testing EDG trips that are bypassed. Confirm that the surveillance testing includes verification of trips that are bypassed and those that are not bypassed (Reference Section 2.2.11 of RG 1.9, Revision 4).
9. VCSNS is currently committed to RG 1.9, Revision 0. The LAR cites RG 1.9, Revision 3, as a guidance document for some of the proposed changes. It should be noted that some of the recommendations in RG 1.9, Revision 3, are based on compliance with other sections of the RG. As indicated in question #2 above, the recommended loading requirement of 90 percent to 100 percent of the EDG rating is based on the premise that the EDG design has 10 percent to 15 percent design margin available. Hence, the NRC staff does not consider compliance with selective sections of RG 1.9, Revision 3, to be an acceptable method for approval of the LAR. Attachment III of the LAR proposes a Regulatory Commitment to comply with RG 1.9, Revision 3 with two noted exceptions. Verify that the VCSNS is in compliance with all other sections of RG 1.9, Revision 3, with clarifications provided in RG 1.9, Revision 4.

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Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosure:
RAI

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*by email dated 2/17/11

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