March 3, 2011

Dr. J. S. Armijo, Vice Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE SOUTHERN NUCLEAR OPERATING COMPANY COMBINED LICENSE APPLICATION FOR VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4

Dear Dr. Armijo:

Thank you for your letter of January 24, 2011, in which the Advisory Committee on Reactor Safeguards (ACRS or the Committee) reported on its safety review of the staff's advanced safety evaluation report for the pending Southern Nuclear Operating Company (SNC) combined license application for Vogtle Electric Generating Plant (VEGP), Units 3 and 4. This combined license application incorporates by reference the application for the Westinghouse Electric Company AP1000 design certification amendment and the SNC VEGP early site permit. ACRS undertook this review to fulfill the requirements of Title 10 of the *Code of Federal* Regulations (10 CFR) 52.87, "Referral to the Advisory Committee on Reactor Safeguards (ACRS)."

In its letter, ACRS concluded that there is reasonable assurance that VEGP Units 3 and 4 can be built and operated without undue risk to public health and safety. The ACRS letter also included specific recommendations on a number of topics. The enclosure to this letter contains the staff's response to those items for which the Committee sought specific staff action.

The staff appreciates the Committee's efforts and suggestions. We thank ACRS for its time and its valuable input, and we look forward to working with the Committee in the future.

Sincerely,

/RA by Martin J. Virgilio for/

R. W. Borchardt
Executive Director
for Operations

Enclosure:
Staff Response to Recommendations

cc: Chairman Jaczko
Commissioner Svinicki
Commissioner Apostolakis
Commissioner Magwood
Commissioner Ostendorff
SECY

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Staff Response to Recommendations in the Advisory Committee on Reactor Safeguards Letter on the Combined License Application for Vogtle Electric Generating Plant, Units 3 and 4

In a letter dated January 24, 2011, the Advisory Committee on Reactor Safeguards (ACRS or the Committee) made conclusions and recommendations about the combined license (COL) application for Vogtle Electric Generating Plant (VEGP), Units 3 and 4. The ACRS letter included specific recommendations on a number of topics. This enclosure provides the staff's response to those recommendations for which the Committee sought specific staff action.

Containment Interior Debris Limitations

The Committee recommended in its letter that the technical specifications (TS) include containment interior cleanliness limits on latent debris. ACRS also indicated that the basis for this recommendation is that the latent fiber acceptance limits should not be changed without the U.S. Nuclear Regulatory Commission (NRC) review. This recommendation is entirely consistent with the Committee's earlier recommendation on long-term cooling performance for the AP1000. The staff agrees with ACRS that the AP1000 fiber limits are particularly stringent and the limits should not be changed without NRC review. However, the staff feels that the most appropriate way to address this issue is by designating the information as Tier 2* in the AP1000 design control document (DCD) rather than by including the limits in the TS of the COL. The AP1000 design includes a number of design commitments to prevent fiber from affecting the emergency core cooling systems. These design commitments will also potentially be subject to change. These design commitments are equally important to the fiber limits for the cleanliness program. Specifically, the inspections, tests, analyses, and acceptance criteria (ITAAC) have already identified, as key design parameters, the design commitments associated with fibrous insulation in the zone of influence and fibrous insulation that may be in the flooded region; however, after plant startup the design parameters, specified in ITAAC are subject to change. A Tier 2* designation will allow the staff to ensure that changes to these key design commitments as well as the latent fiber acceptance criteria will require NRC review. This approach will achieve the intent of the ACRS recommendation while maintaining a consistent approach to TS. Additionally, including the information in Tier 2* of the DCD will ensure standardization across the entire fleet of AP1000s.

Inservice Inspection/Inservice Testing Program Requirements for Squib Valves

During the course of the ACRS review, the Committee acknowledged that the AP1000 DCD includes ITAAC to confirm squib valve qualification. However, the Committee recommended establishing a regulatory requirement that focuses on the development of the inservice inspection (ISI)/inservice testing (IST) program, including a review of the lessons learned from the valve design and qualification process.

The staff understands the Committee's concern about an effective ISI/IST program for the AP1000 squib valves. The staff plans to address the ACRS recommendation on squib valves as follows:

- The NRC staff will monitor the efforts by Westinghouse Electric Company and Southern Nuclear Operating Company (SNC) to develop ISI/IST provisions for squib valves to be

used in the AP1000 reactor that incorporate lessons learned from the design and qualification of the squib valve

- The NRC staff will interact with nuclear regulators in the United Kingdom and other countries to exchange information on appropriate ISI/IST provisions for squib valves in new reactors.

- The NRC staff will participate in the activities of the committee responsible for the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code) to prepare a revision to the code for new reactors, including consideration of ISI/IST provisions for squib valves.

- The NRC will incorporate by reference the ASME OM Code edition on new reactors into Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a, "Codes and Standards."

- The agency in 10 CFR 50.55 a (f)(4) requires licensees to implement the ASME OM Code incorporated by reference in 10 CFR 50.55a 12 months before fuel loading.

- In the event that the ASME OM Code for new reactors is not prepared in a timely manner or does not include sufficient provisions for squib valve ISI/IST, the NRC staff is proposing to develop a specific regulatory requirement in 10 CFR 50.55a for the ISI/IST program for squib valves in new reactors.

Power Measurement Uncertainty

In its application, SNC stated that it has chosen the Caldon/Cameron LEFM CheckPlus™ system as the instrumentation for feedwater flow measurement. SNC did this to address AP1000 DCD COL Information Item 15.0-1, which requires that after selecting the actual plant operating instrumentation, the COL holder will calculate the primary power calorimetric uncertainty and confirm that the calculated uncertainty value is bounded by the safety analysis primary power calorimetric uncertainty (i.e., 1 percent). The applicant proposed an ITAAC to confirm proper installation of the instrumentation with power measurement uncertainty of 1 percent or less, and a license condition to provide confirmation that the administrative controls are in place.

During the course of the ACRS review, the Committee was concerned that SNC had not explicitly committed to perform calibrations with representative piping configurations and to conduct in-plant confirmatory tests.

In response to the ACRS concern about the clarity of the commitments to proper calibration and in-plant confirmation testing, SNC revised its application as follows:

> The AP1000 main feedwater flow measurement instrumentation, consistent with the use of normalized flow meters, is required to be calibrated at a certified test laboratory in hydraulic model geometry consistent with AP1000 plant design. Prior to installation, the LEFM CheckPlus System will be calibrated at a certified facility (e.g., Alden Research Laboratories) with a test model representative of plant piping configurations. Calibration standards will be traceable to National

Institute of Standards and Technology standards. After installation in the plant, the LEFM CheckPlus System will be tested in accordance with the LEFM CheckPlus system commissioning procedure developed by Cameron to confirm that the actual instrument performance is consistent with the assumptions of the uncertainty calculation. Therefore, additional justification for use of the LEFM is not required.

In addition, the applicant also stated that it will revise Chapter 15, Section 15.0.3.2, of the final safety analysis report for the VEGP COL to reflect this response. The staff finds that these revisions establish an explicit commitment to perform appropriate calibrations for the LEFM CheckPlus™ system, and to conduct in-plant confirmatory tests in accordance with the commissioning procedure developed by Cameron. These commitments ensure the accuracy of the feedwater flow measurement to meet the requirement for power measurement uncertainty of 1 percent or less.

Incorporation of Changes to the Design Control Document

The ACRS letter also recommended that the staff review with ACRS any changes in the design or commitments that are not yet incorporated in the COL application or referenced in the DCD that significantly deviate from those presented during the ACRS review. The staff is accomplishing this as part of its closure of confirmatory items based on the SNC submittal dated January 31, 2011, which incorporates Revision 18 of the DCD. If any changes in the design or commitments that are not yet incorporated in the COL application or referenced in the DCD require a significant change to the staff's safety evaluation for the VEGP COL application, the staff will review those changes with ACRS.