

March 26, 2011

Dr. Said Abdel-Khalik, Chairman  
Advisory Committee on Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE SOUTH CAROLINA ELECTRIC  
AND GAS COMPANY COMBINED LICENSE APPLICATION FOR  
VIRGIL C. SUMMER NUCLEAR STATION, UNITS 2 AND 3

Dear Dr. Abdel-Khalik:

Thank you for your letter of February 17, 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 South Carolina Electric and Gas combined license application for Virgil C. Summer Nuclear Station (VCSNS), Units 2 and 3. This combined license application incorporates by reference the application for the Westinghouse Electric Company AP1000 design certification amendment. ACRS undertook this review to fulfill the requirements of Title 10 of the *Code of Federal Regulations* 52.87, "Referral to the Advisory Committee on Reactor Safeguards (ACRS)."

In its letter, ACRS concluded that there is reasonable assurance that VCSNS Units 2 and 3 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.

S. Abdel-Khalik

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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

Docket Nos. 52-027 and 52-028

Enclosure:  
Staff Response to Recommendations

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

S. Abdel-Khalik

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**Staff Response to Recommendations in the Advisory Committee on Reactor Safeguards  
Letter on the Combined License Application  
for Virgil C. Summer Nuclear Station, Units 2 and 3**

In a letter dated February 17, 2011, the Advisory Committee on Reactor Safeguards (ACRS or the Committee) made conclusions and recommendations about the combined license (COL) application for Virgil C. Summer Nuclear Station (VCSNS), Units 2 and 3. The ACRS letter included specific recommendations on a number of topics. This enclosure provides the U.S. Nuclear Regulatory Commission (NRC) staff's response to those recommendations for which the Committee sought specific staff action.

**Applicability of Recommendations 2 through 5 in the ACRS Letter of January 24, 2011**

In its February 17, 2011, letter, the Committee noted that recommendations 2 through 5 in the Committee's January 24, 2011, letter, concerning the reference COL application for Vogtle Electric Generating Plant (VEGP), Units 3 and 4, are also applicable to the subsequent COL application for VCSNS Units 2 and 3. Recommendations 2 through 5 of the Committee's January 24, 2011, letter on VEGP Units 3 and 4 included recommendations related to the following:

- containment interior debris limitations
- inservice inspection and inservice testing program requirements for squib valves
- power measurement uncertainty
- incorporation of changes to the design control document (DCD)

In a letter dated March 3, 2011, the NRC staff responded to the Committee's January 24, 2011, letter on VEGP. The staff's March 3, 2011, letter discussed how the staff intends to address these issues for the VEGP Units 3 and 4 COL application. The staff intends to resolve these issues for VCSNS Units 2 and 3 in the same manner it committed to resolving them for the VEGP Units 3 and 4 COL application, with the additional comments and clarifications given below.

**Containment Interior Debris Limitations**

As stated in its March 3, 2011, letter on VEGP, the staff intends to designate as Tier 2\* key design commitments associated with fibrous insulation in the zone of influence and with fibrous insulation that may be in the flooded region, as well as the cleanliness limits on latent debris. As noted in the March 3, 2011, letter, a Tier 2\* designation will allow the staff to ensure that changes to these commitments and acceptance criteria will require NRC review. Additionally, including this information in Tier 2\* of the DCD will ensure standardization across the entire fleet of AP1000s.

**Inservice Inspection and Inservice Testing Program Requirements for Squib Valves**

The staff's March 3, 2011, response to the Committee's recommendations on VEGP applies to all AP1000 COL applications.

Enclosure

### Power Measurement Uncertainty

In its March 3, 2011, response to the Committee's recommendations on VEGP, the staff noted that Southern Nuclear Operating Company (SNC) will revise Section 15.0.3.2 of the final safety analysis report for the VEGP COL to address the Committee's concerns. SNC committed to making these changes to the VEGP COL application in a letter dated February 8, 2011. In a letter dated February 14, 2011, South Carolina Electric and Gas (SCE&G) endorsed SNC's February 8, 2011, response and committed to incorporating the same changes identified in this response into Revision 5 of its COL application for VCSNS.

### Incorporation of Changes to the Design Control Document

In its March 3, 2011, response to the Committee's recommendation on VEGP, the staff committed as part of its closure of the confirmatory items that, if any changes in the design or commitments that are not yet incorporated into the COL application or referenced in the DCD require a major change to the staff's safety evaluation for the COL application, the staff will review those changes with ACRS. The staff notes that it will perform this assessment for both site-specific confirmatory items and confirmatory items that are associated with items that are standard across the AP1000 COL applications. Therefore, if the staff identifies any major changes that need to be made to the site-specific portion of the VCSNS COL application, it will review these changes with ACRS.

### **Limiting Use of the Current Version of the HABIT Code to Neutral-Density Gas Dispersion Modeling**

The NRC staff used the HABIT code for its confirmatory calculations of the effects of an accidental release of toxic gas near the VCSNS Units 2 and 3 site. SCE&G used a public domain computer code, ALOHA, developed by the U.S. Environmental Protection Agency that offers both heavy and neutral-density gas dispersion models. The Committee observed in its February 17, 2011, letter that HABIT only models neutral-density gas dispersion and does not consider heavy gas effects and recommended that the staff limit the use of the current version of the HABIT code to neutral-density gas dispersion modeling.

The staff agrees with the Committee that HABIT does not offer an explicit heavy gas dispersion model as ALOHA does, and that this is a limitation of the HABIT code. The staff is aware that ALOHA also has some limitations, as stated in the ALOHA code manual. The staff is mindful of the limitations of both codes but finds value in having alternative codes to perform independent studies as long as the limitations are understood and the codes are applied correctly. As indicated during the ACRS AP1000 subcommittee meeting on January 11, 2011, the staff is preparing a user need request for the Office of Nuclear Regulatory Research to improve and benchmark the HABIT code for toxic gas evaluation for control room habitability. As a part of the user need request, the staff also plans to investigate the heavy gas dispersion capabilities of HABIT.

The staff does not believe that the limitations in the heavy gas dispersion capabilities of HABIT or any limitation of ALOHA affect its conclusions regarding the analysis of accidental releases of toxic gases documented in the VCSNS safety evaluation report. In its February 17, 2011, letter the ACRS noted the conservative assumptions used in the applicant's ALOHA analysis for the VCSNS site, such as the assumed dispersion over flat terrain even though the plant would be located well above possible release locations. While noting the concern regarding HABIT, the February 17, 2011, ACRS letter also states that there is reasonable assurance that VCSNS, Units 2 and 3, can be built and operated without undue risk to the health and safety of the public, and the staff agrees with that conclusion.