



Brian H. Whitley
Director
Regulatory Affairs

**Southern Nuclear
Operating Company, Inc.**
42 Inverness Center Parkway
Birmingham, AL 35242
Tel 205.992.7079
Fax 205.992.5296

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Docket Nos.: 52-025
52-026

ND-18-0111
10 CFR 50.90
10 CFR 52.98(c)

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Supplement to Request for License Amendment Regarding:
Passive Residual Heat Removal Heat Transfer and In-containment Refueling Water
Storage Tank Heat Up Test Acceptance Criteria Change (LAR-17-033S1)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requested an amendment to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively), by SNC letter ND-17-1428, dated October 6, 2017 [ADAMS Accession Number ML17279B017]. The requested amendment proposes to depart from the incorporated plant-specific Design Control Document (DCD) Tier 2 information and a COL License Condition which references a UFSAR Section impacted by one of the proposed changes.

The proposed changes would revise the licensing basis documents to change the methodology and acceptance criteria for the in-containment refueling water storage tank (IRWST) heatup preoperational test described in UFSAR Subsection 14.2.9.1.3, Item (h) and the passive residual heat removal (PRHR) heat exchanger preoperational test described in UFSAR Subsection 14.2.9.1.3, Item (g). These changes involve material which is specifically referenced in Section 2.D.(2) of the COLs for VEGP Units 3 and 4.

Enclosure 3 to this letter supplements LAR-17-033 to address a Request for Additional Information (RAI) from the NRC Staff, which was transmitted by electronic mail (email) on January 30, 2018 [ADAMS Accession Number ML18030A734], to support review of LAR-17-033. This supplement does not impact the scope, document markups, technical content, or conclusions of the Technical Evaluation, Significant Hazards Consideration Determination, or Environmental Considerations of the original License Amendment Request (LAR) provided in Enclosures 1 and 2 of SNC letter ND-17-1428.

This letter contains no regulatory commitments. This letter has been reviewed and determined not to contain security related information.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia by transmitting a copy of this letter and its enclosure to the designated State Official.

SNC requests staff approval of this LAR by August 21, 2018 to support planning and execution of IRWST heatup testing. This approval date has been revised since the original submittal of LAR-17-033 because SNC is developing other licensing actions that are dependent on the approval of this LAR. SNC expects to implement the proposed amendment through incorporation into the licensing basis documents; e.g., the UFSAR, within 30 days of approval of the requested changes.

Should you have any questions, please contact Ms. Stephanie Agee at (205) 992-7556.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28th of February 2018.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Brian H. Whitley", is written over a horizontal line.

Brian H. Whitley
Director, Regulatory Affairs
Southern Nuclear Operating Company

- Enclosures: 1 - 2) (Previously submitted with the original LAR, LAR-17-033, in SNC letter ND-17-1428)
- 3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Response to NRC Request for Additional Information (RAI) Regarding LAR 17-033 (LAR-17-033S1)

cc:

Southern Nuclear Operating Company / Georgia Power Company

Mr. S. E. Kuczynski (w/o enclosure)
Mr. M. D. Rauckhorst
Mr. D. G. Bost (w/o enclosure)
Mr. M. D. Meier (w/o enclosure)
Mr. D. H. Jones (w/o enclosure)
Mr. D. L. McKinney (w/o enclosure)
Mr. T. W. Yelverton (w/o enclosure)
Mr. B. H. Whitley
Mr. J. J. Hutto
Mr. C. R. Pierce
Ms. A. G. Aughtman
Mr. D. L. Fulton
Mr. M. J. Yox
Mr. J. Tupik
Mr. W. A. Sparkman
Ms. A. C. Chamberlain
Ms. A. L. Pugh
Mr. J. D. Williams
Mr. F. J. Redwanz
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Nuclear Regulatory Commission

Mr. W. Jones (w/o enclosure)
Ms. J. Dixon-Herrity
Mr. C. Patel
Ms. J. M. Heisserer
Mr. B. Kemker
Mr. G. Khouri
Ms. S. Temple
Mr. F. Brown
Mr. T.E. Chandler
Ms. P. Braxton
Mr. T. Brimfield
Mr. C. J. Even
Mr. A. Lerch

State of Georgia

Mr. R. Dunn

Oglethorpe Power Corporation

Mr. M. W. Price
Mr. K. T. Haynes
Ms. A. Whaley

Municipal Electric Authority of Georgia

Mr. J. E. Fuller
Mr. S. M. Jackson

Dalton Utilities

Mr. T. Bundros

Westinghouse Electric Company, LLC

Mr. L. Oriani (w/o enclosure)
Mr. G. Koucheravy (w/o enclosure)
Mr. M. Corletti
Mr. M. L. Clyde
Ms. L. Iller
Mr. D. Hawkins
Mr. J. Coward

Other

Mr. S. W. Kline, Bechtel Power Corporation
Ms. L. A. Matis, Tetra Tech NUS, Inc.
Dr. W. R. Jacobs, Jr., Ph.D., GDS Associates, Inc.
Mr. S. Roetger, Georgia Public Service Commission
Ms. S. W. Kernizan, Georgia Public Service Commission
Mr. K. C. Greene, Troutman Sanders
Mr. S. Blanton, Balch Bingham
Mr. R. Grumbir, APOG
NDDocumentinBox@duke-energy.com, Duke Energy
Mr. S. Franzone, Florida Power & Light

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Enclosure 3

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

**Response to NRC Request for Additional Information (RAI)
Regarding LAR 17-033**

(LAR-17-033S1)

(This Enclosure consists of 3 pages, including this cover page)

The following request for additional information (RAI) [ADAMS Accession Number ML18030A734] regarding the review of Southern Nuclear Operating Company (SNC) License Amendment Request (LAR) 17-033, submitted by SNC letter ND-17-1428, was provided by the NRC Staff on January 30, 2018.

Request for Additional Information (RAI):

10 CFR Part 50, Appendix A, General Design Criterion 37, "Testing of emergency core cooling system", requires in part that the emergency core cooling system shall be designed to permit appropriate periodic pressure and functional testing to assure the operability of the system as a whole and, under conditions as close to design as practical, the performance of the full operational sequence that brings the system into operation. The IRWST and PRHR heat exchanger make up part of the emergency core cooling system for this design.

One of the proposed changes in the LAR changes the acceptance criterion in UFSAR Subsection 14.2.9.1.3 from supporting the safe shutdown temperature criteria in Chapter 19 to demonstrating that the average IRWST heatup is consistent with the PRHR heat transfer modeling in Chapter 15. It is not clear to the staff how this acceptance criteria will be satisfied – unlike the previous acceptance criteria, which had a clear numerical basis (420F in 36 hours), the revised acceptance criteria cites consistency with a modeling approach. The technical evaluation section of the LAR states that data from the test will still be used to support the overall PPRHR heat transfer assumptions, and that the use of LOFTRAN "allows for a one-to-one comparison between the as-built plant and the safety analysis presented in Chapter 15". Staff recognizes that testing at conditions akin to those in Chapter 15 and/or Chapter 19 may not be practical. However, the staff needs additional description of how the proposed test will demonstrate system performance under the expected conditions. Accordingly, staff requests that the applicant provide additional detail regarding the new acceptance criteria for a satisfactory test, and how the test data will be used to demonstrate consistency with the analysis documented in Chapter 15.

SNC Response to RAI:

The proposed changes to the acceptance criterion in Updated Final Safety Analysis Report (UFSAR) Subsection 14.2.9.1.3 Item (h) are intended to be coupled to the acceptance of the tests described in UFSAR Subsection 14.2.9.1.3 Items (f) and (g) to demonstrate that the Passive Residual Heat Removal Heat Exchanger (PRHR HX) heat transfer rate (e.g., as listed in Item (f) as $\geq 1.78 \text{ E}+08 \text{ Btu/hr}$ based on a 520°F hot leg temperature) is conservatively predicted in the Chapter 15 analyses. The purpose of the In-Containment Refueling Water Storage Tank (IRWST) Heatup Test is to gather data that would be used in conjunction with the other data obtained during the PRHR HX tests described in Items (f) and (g) (e.g., natural circulation flow rate and the heat exchanger inlet and outlet temperatures) to determine the as-built PRHR HX's heat transfer performance. The heat transfer rates calculated from the test data are to be adjusted to account for differences in the IRWST temperatures among other parameters as stated in Items (f) and (g). This adjustment is necessary to normalize the test results to compare to the heat transfer rates predicted for the test using the Chapter 15 LOFTRAN code (which is calculated with the specified conditions described in Items (f) and proposed Item (g) of the inlet temperature of 250°F, the initial IRWST temperature of 80°F and the design basis number of tubes plugged). The normalized test results will be reviewed to confirm that the PRHR HX performs as predicted (or better than predicted) by the analysis model. Since the analysis model used for the tests is the same analysis model used for the Chapter 15 analysis, with differences in input parameters due to the differences in the test conditions from the postulated accident conditions, the test results

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Enclosure 3

Response to NRC Request for Additional Information (RAI) Regarding LAR 17-033
(LAR-17-033S1)

demonstrate that the Chapter 15 model and methodology are sufficient to conservatively predict PRHR HX performance documented in the safety analyses. Therefore, the acceptance criteria for the IRWST Heatup Test is considered satisfied if the measured IRWST temperatures demonstrate that the average IRWST heatup during the test supports a normalized PRHR HX heat transfer rate that is greater than or equal to the LOFTRAN predicted heat transfer rate for the specific conditions described for the acceptance criteria of the PRHR HX Heat Transfer Tests.