

Michael J. Yox  
Regulatory Affairs Director  
Vogtle 3 & 4  
Nuclear Development

Southern Nuclear  
Operating Company, Inc.  
7825 River Road  
Waynesboro, GA 30830  
Tel: 706.848.6459



Docket No.: 52-026

**JUN 29 2016**

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

ND-16-1007  
10 CFR 52.99(c)(1)

Southern Nuclear Operating Company  
Vogtle Electric Generating Plant Unit 4  
ITAAC Closure Notification on  
Completion of ITAAC 2.1.01.07.iii [Index Number 10]

Ladies and Gentlemen:

In accordance with 10 CFR 52.99(c)(1), the purpose of this letter is to notify the Nuclear Regulatory Commission (NRC) of the completion of Vogtle Electric Generating Plant (VEGP) Unit 4 Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Item 2.1.01.07.iii [Index Number 10] for verifying that the calculated effective neutron multiplication factor for the new and spent fuel storage racks meets the requirements of 10 CFR 50.68 limits during design basis seismic events. The closure process for this ITAAC is based on the guidance described in NEI 08-01, "Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52," which was endorsed by the NRC in Regulatory Guide 1.215.

This letter contains no new NRC regulatory commitments. Southern Nuclear Operating Company (SNC) requests NRC staff confirmation of this determination and publication of the required notice in the Federal Register per 10 CFR 52.99.

If there are any questions, please contact David Woods at 706-848-6903.

Respectfully submitted,

Michael J. Yox  
Regulatory Affairs Director Vogtle 3&4  
MJY/BH/amm

Enclosure: Vogtle Electric Generating Plant (VEGP) Unit 4  
Completion of ITAAC 2.1.01.07.iii [Index Number 10]

U.S. Nuclear Regulatory Commission

ND-16-1007

Page 2 of 3

**To:**

**Southern Nuclear Operating Company/Georgia Power Company**

Mr. S. E. Kuczynski (w/o enclosures)

Mr. D. A. Bost (w/o enclosures)

Mr. M. D. Meier

Mr. M. D. Rauckhorst (w/o enclosures)

Mr. D. H. Jones (w/o enclosures)

Ms. K. D. Fili

Mr. D. L. McKinney

Mr. B. H. Whitley

Mr. D. L. Fulton

Mr. C. E. Morrow

Mr. M. J. Yox

Mr. D. Woods

Ms. A. L. Pugh

Ms. K. Stacy

Mr. J. J. Olson

Mr. W. A. Sparkman

Mr. J. P. Redd

Mr. D. R. Culver

Document Services RTYPE: VND.LI.L06

File AR.01.02.06

cc:

**Nuclear Regulatory Commission**

Ms. C. Haney (w/o enclosures)

Mr. M. Delligatti (w/o enclosures)

Mr. L. Burkhardt (w/o enclosures)

Mr. C. Patel

Mr. B. M. Bovol

Ms. R. Reyes

Ms. M. A. Sutton

Mr. M. E. Ernestes

Mr. G. Khouri

Mr. M. G. Kowal

Mr. J. D. Fuller

Mr. T. Chandler

Ms. S. Temple

Ms. P. Braxton

Mr. T. Brimfield

**Oglethorpe Power Corporation**

Mr. M. W. Price

Ms. K. T. Haynes

Ms. A. Whaley

**Municipal Electric Authority of Georgia**

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

**Dalton Utilities**

Mr. D. Cope

**WECTEC**

Ms. K. Stoner (w/o enclosures)  
Mr. C. A. Castell

**Westinghouse Electric Company, LLC**

Mr. R. Easterling (w/o enclosures)  
Mr. J. W. Crenshaw (w/o enclosures)  
Mr. L. Woodcock (w/o enclosures)  
Mr. M. P. Rubin  
Mr. P. A. Russ  
Mr. G. F. Couture  
Mr. M. Y. Shaqqo  
Ms. S. DiTommaso

**Other**

Mr. J. E. Hesler, *Bechtel Power Corporation*  
Ms. L. 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*

**Southern Nuclear Operating Company  
ND-16-1007  
Enclosure**

**Vogtle Electric Generating Plant (VEGP) Unit 4  
Completion of ITAAC 2.1.01.07.iii [Index Number 10]**

## **ITAAC Statement**

### **Design Commitment:**

7. The new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation, design basis seismic events, and design basis dropped spent fuel assembly accidents over the spent fuel storage racks.

### **Inspections, Tests, Analyses:**

- iii) Seismic analysis of the new and spent fuel storage racks will be performed.

### **Acceptance Criteria:**

- iii) A report exists and concludes that the new and spent fuel racks can withstand seismic design basis dynamic loads and maintain the calculated effective neutron multiplication factor required by 10 CFR 50.68<sup>(1)</sup> limits.

### **Note:**

1. The requirements of 10 CFR 50.68 are summarized as follows:
  - For new fuel storage racks:
    - The effective neutron multiplication factor (K-effective) must not exceed 0.95 when flooded with unborated water and
    - K-effective must not exceed 0.98 with optimum moderator conditions.
  - For spent fuel storage racks:
    - If methodology does not take credit for soluble boron:
      - K-effective must not exceed 0.95 when flooded with unborated water.
    - Or if methodology takes credit for soluble boron:
      - K-effective must not exceed 0.95 when flooded with borated water and
      - K-effective must remain below 1.0 when flooded with unborated water.

## **ITAAC Determination Basis**

Multiple Inspections Tests, Analyses and Acceptance Criteria (ITAAC) are used to verify the new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation, design basis seismic events, and design basis dropped spent fuel assembly accidents over the spent fuel storage racks. This ITAAC requires that a seismic analysis be performed and a report exist that concludes the new and spent fuel racks can withstand seismic design basis dynamic loads and maintain the calculated effective neutron multiplication factor required by 10 CFR 50.68 limits.

The requirements of 10 CFR 50.68 are summarized as follows:

- For new fuel storage racks:
  - The effective neutron multiplication factor (K-effective) must not exceed 0.95 when flooded with unborated water and
  - K-effective must not exceed 0.98 with optimum moderator conditions.

- For spent fuel storage racks:
  - If methodology does not take credit for soluble boron:
    - K-effective must not exceed 0.95 when flooded with unborated water.
  - Or if methodology takes credit for soluble boron:
    - K-effective must not exceed 0.95 when flooded with borated water and
    - K-effective must remain below 1.0 when flooded with unborated water.

The AP1000 new and spent fuel storage racks are designed as Seismic Category 1 equipment. The seismic/structural analyses for the AP1000 new and spent fuel storage racks have been performed in accordance with American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III (Reference 1). Seismic loads were established using the AP1000 Safe Shutdown Earthquake floor response spectra.

The criticality analyses for the AP1000 new fuel storage rack and spent fuel storage racks have been conducted to comply with the requirements of 10 CFR 50.68. The analyses employ the KENO version V.a model for the new fuel storage rack, and Monte Carlo N-Particle Transport Code (MCNP) version 4A, for the spent fuel storage racks. Each analysis evaluated a three dimensional model of the fuel storage racks filled with a maximum 5.0 weight-percent U-235 Westinghouse AP1000 17x17 fuel assemblies. The new fuel storage rack is modeled inside a concrete vault optimally moderated and fully flooded with unborated water. The spent fuel storage racks are modeled inside a pool fully flooded with borated and unborated water.

The results as documented in the structural/seismic analyses for the new fuel storage rack (Reference 2) and the spent fuel storage rack (Reference 3) demonstrate the racks meet the requirements for structural integrity under seismic loads since stress conditions have a safety factor greater than 1.0 and are within the ASME allowable limits.

The results as documented in the criticality analysis for the new fuel storage rack (Reference 4) and the criticality analysis for the spent fuel storage racks (Reference 5) demonstrate the maximum K-effective value for the new storage rack is 0.9205, and the spent fuel storage racks is 0.9207 (with borated water) and 0.9950 (with unborated water) which meet the ITAAC acceptance criteria.

### **ITAAC Finding Review**

In accordance with plant procedures for ITAAC completion, Southern Nuclear Operating Company (SNC) performed a review of all ITAAC findings pertaining to the subject ITAAC and associated corrective actions. This review found that there are no relevant ITAAC findings associated with this ITAAC. The ITAAC completion review document number is included in the Vogtle Unit 4 ITAAC Completion Package for ITAAC 2.1.01.07.iii (Reference 6) and available for NRC inspection.

### **ITAAC Completion Statement**

Based on the above information, SNC hereby notifies the NRC that ITAAC 2.1.01.07.iii was performed for VEGP Unit 4 and that the prescribed acceptance criteria are met.

Systems, structures, and components verified as part of this ITAAC are being maintained in their as-designed, ITAAC compliant condition in accordance with approved plant programs and procedures.

**References (available for NRC inspection)**

1. ASME Boiler and Pressure Vessel Code Section III, 1998 Edition with 2000 Addenda.
2. APP-GW-GLR-026, Rev 5, New Fuel Storage Rack Structural/Seismic Analysis
3. APP-GW-GLR-033, Rev 5, Spent Fuel Storage Racks Structural/Seismic Analysis
4. APP-GW-GLR-030, Rev. 0, New Fuel Storage Rack Criticality Analysis
5. APP-GW-GLR-029, Rev. 4, AP1000 Spent Fuel Storage Racks Criticality Analysis
6. SVP\_SV0\_003954, Attachment 1, Submittal of Inspections, Test, Analyses and Acceptance Criteria (ITAAC) Completion Package for Unit 4 ITAAC 2.1.01.07.iii (COL Index Number 10) (Spent Fuel Storage Racks Structural/Seismic Analysis)