



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

August 24, 2011

Mr. Joseph A. (Buzz) Miller
Executive Vice President
Southern Nuclear Operating Company
241 Ralph McGill Blvd.
BIN 10232
Atlanta, GA 30308-3374

**SUBJECT: VOGTLE ELECTRIC GENERATING PLANT UNIT 3 – NRC INSPECTION
REPORT NO. 05200025/2011-007**

Dear Mr. Miller:

On August 5, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection of equipment qualification activities performed for your Vogtle Electric Generating Plant (VEGP) Unit 3 at Wyle Laboratories' testing facility in Huntsville, AL. The enclosed inspection report documents the inspection results, which were discussed on August 5, 2011, with Mr. Don Smith of Wyle Laboratories and representatives from Southern Nuclear Operating Company, Westinghouse Electric Company, and EnerSys.

The inspection examined pre-construction activities that could affect the quality of safety-related structures, systems, and components, and were associated with the proposed inspections, tests, analyses and acceptance criteria (ITAAC) submitted in your application for a combined construction permit and operating license for a Westinghouse Advanced Passive (AP1000) pressurized water reactor designated as VEGP Unit 3. Within these areas, the inspection consisted of the selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response if you choose to provide one for cases where a response is not required, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

J. Miller

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Should you have any questions concerning this letter, please contact me at (404) 997-4415.

Sincerely,

/RA/

Alan Blamey, Chief
Construction Projects Branch 2
Division of Construction Projects

Docket Nos.: 52-025

Enclosure: NRC Inspection Report 05200025/2011007
w/Attachment: Supplemental Information

cc w/encl: (See next page)

J. Miller

2

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Sincerely,

/RA/

Alan Blamey, Chief
Construction Projects Branch 2
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Docket Nos.: 52-025

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cc w/encl: (See next page)

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NAME	M. Bates	C. Jones	A. Blamey				
DATE	08/23/2011	8/23/2011	8/24/2011				
E-MAIL COPY?	YES NO	YES NO	YES NO				

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Letter to Mr. Joseph A (Buzz) Miller from Alan Blamey dated August 24, 2011

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT UNIT 3 – NRC INSPECTION REPORT
05200025/2011007

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U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket No: 52-025

License No: N/A

Report No.: 05200025/2011007

Applicant: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Electric Generating Plant Unit 3

Location: Wyle Laboratories, Inc., Huntsville, AL

Inspection Dates: July 28 through August 5, 2011

Inspectors: C. Jones, Sr. Construction Inspector, RII/CCI

Accompanying
Personnel: None

Approved By: Alan Blamey, Chief
Construction Projects Branch 2
Division of Construction Projects

Enclosure

SUMMARY OF FINDINGS

Inspection Report 052025/2011007; 07/28/2011 through 08/5/2011; Vogtle Electric Generating Plant (VEGP) Unit 3; Pre-construction Inspection of Applicant's Oversight of Equipment Qualification Testing of 250 Vdc Batteries.

The report covered an announced inspection by a regional senior construction inspector of equipment qualification activities. No findings of significance were identified. The Nuclear Regulatory Commission's (NRC's) program for overseeing the construction of commercial nuclear power reactors is described in Inspection Manual Chapter (IMC) 2506, "Construction Reactor Oversight Process General Guidance and Basis Document."

A. NRC-Identified Findings and Licensee Identified/Self-Revealing Violations Evaluated as Findings

None

B. Applicant-Identified and Self-Revealing Violations Not Evaluated as Findings

None

REPORT DETAILS

B. NON-ITAAC-RELATED INSPECTIONS

a. Inspection Scope

On July 28 through August 5, the inspectors conducted a pre-construction inspection of Southern Nuclear Operating Company's (SNC) oversight of equipment qualification testing for the AP1000 24-hour and 72-hour Class 1E 250 Vdc batteries. The inspection was conducted to evaluate the implementation effectiveness of the 10 CFR 50 Appendix B quality assurance (QA) program, the applicant's oversight of their contractors, and the adequacy of measures implemented to demonstrate equipment qualification.

The equipment qualification activity observed in this inspection was performed by the applicant's contractors to support future closure of an Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) that has been proposed for Class 1E batteries in the combined construction permit and operating license (COL) application for Vogtle Unit 3. The proposed ITAAC number is ITAAC 2.6.3.2. As specified in the AP1000 Design Control Document (DCD), provided with the COL application, Acceptance Criterion ii of the proposed ITAAC requires the Class 1E 250 Vdc batteries to withstand seismic design basis loads without loss of safety function.

The inspector conducted observations of applicant activities, conducted interviews with responsible personnel, and reviewed documents and records to verify seismic qualification testing was conducted in accordance with the certified design, NRC regulations, and applicable industry consensus standards. The list of documents reviewed is contained in the supplement information attachment to this report.

Conduct of Equipment Qualification Tests

The test configuration consisted of eight EnerSys Type GN-29 lead-acid wet cells mounted on a previously qualified two-tier rack that was welded to the seismic shaker table. The tri-axial test table was designed to apply random multi-frequency acceleration for pre-programmed time periods. On July 29, the inspector observed the following sequential test activities associated with batteries that had been subjected to an accelerated aging process which was designed to represent a qualified life of 10 years:

- Simulations of six operating basis earthquakes (OBEs) – The OBEs were postulated to occur over the service life of the batteries. Although only five OBE tests were specified by the test plan, the response spectra for the first test failed to fully envelop the required response spectra and the test sequence had to be re-initiated to provide the proper test inputs.
- Simulations of one safe shutdown earthquake (SSE) - The battery cells were connected to a constant 20 amp load to demonstrate functionality during seismic tests. The inspector reviewed the test response spectra and electrical load to verify they were consistent with Westinghouse specifications and industry standards.

- Hard rock high frequency screening test (HRHF) - This test was conducted to obtain data to support a determination whether acceleration in the range of 25-50 Hz adversely affected the performance of electrical equipment. Test personnel identified an anomaly where, during two test attempts, the shaker table was unable to achieve the required acceleration to the battery assembly for a discrete portion of the required spectrum. Test personnel identified the condition as a procedure anomaly that would require a formal disposition in the test report.
- The 24 hour and 72 hour post-seismic modified performance tests – The inspector monitored the first hour of the tests and subsequently reviewed records of data generated during the balance of battery testing. The inspector reviewed the load profiles applied to the batteries to verify the profiles were consistent with Westinghouse specifications and industry standards.

Following the completion of seismic testing the inspector conducted a direct examination of components, including the battery cells, cell connections, and support rack to assess the condition of the equipment.

Implementation of Appendix B QA Program

Testing services were provided by an Appendix B supplier, Wyle Laboratories, Inc., under contract with the battery manufacturer, EnerSys of Reading, PA. In turn, EnerSys was an Appendix B supplier under contract with Westinghouse Electric Company to supply qualified batteries for the AP1000 reactor design. Westinghouse representatives stated in an interview with the inspector that, consistent with Section 3.11.5 of the AP1000 Design Control Document, Westinghouse Electric Company LLC was acting as the agent for SNC during the equipment qualification phase.

The inspector observed the oversight and control of testing as implemented by EnerSys, Westinghouse, and SNC. The inspection was conducted to determine whether purchased services were adequately monitored for acceptance and that testing activities were properly controlled.

The inspector reviewed applicable procurement documents to determine whether the documents adequately established the technical and quality requirements for the qualification activity.

The inspector reviewed test plans, drawings for assembly and electrical connections, instruction manuals, and specifications to determine whether design requirements from the AP1000 design control document and applicable industry standards were correctly incorporated and controlled. The following IEEE standards were specifically applicable to this activity:

- IEEE 323-1974, IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations
- IEEE 344-1987, IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations
- IEEE 450-2002, IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications

- IEEE 535-2006, IEEE Standard for Qualification of Class 1E Lead Storage Batteries for Nuclear Power Generating Stations

Direct observations of work activities were performed to verify that work was executed according to written and approved procedures, instructions, and drawings, and whether current versions of the documents were available at the work locations.

Inspection reviews of selected measurement and test equipment were performed to determine whether the calibration status of the equipment was adequately established and that the use of the equipment was properly controlled. The equipment reviewed included the Bitrode Model DTV1-3000-24 load testing unit and a Proto torque wrench (Asset ID 113713).

The inspector's observations of test activities included a review to verify off-normal or unexpected conditions were identified and dispositioned by the designated authority.

b. Findings

No findings of significance were identified.

B. EXIT MEETINGS SUMMARY

On July 29, 2011 and August 5, 2011, the inspectors presented the inspection results to Mr. D. Smith, Mr. T. Boonarkat, and representatives for SNC, EnerSys, and Westinghouse, who acknowledged the inspection results. The inspector stated that no proprietary information would be included in the inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant personnel

B. Bedford, Sr. Licensing Engineer- Summer 2 & 3, Westinghouse
J. Bloom, Equipment Qualification Engineer, Westinghouse
S. Felice, Calibration Shop Supervisor, Wyle
R. Francis, Manager Nuclear Program Development, Wyle
S. Kasturi, Technical Consultant, EnerSys
M. Migliaro, Technical Consultant, EnerSys
G. Popp, Technical Consultant, EnerSys
J. Reber, Director of Engineering, EnerSys
D. Smith, Project Engineer, Wyle
R. Terceno, Quality Assurance & Safety Manager, Wyle
C. Truong, Licensing Engineer, Southern Nuclear Operating Company
K. Wilson, Vice President T&E East, Wyle

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Section B: Non-ITAAC-Related Inspections

EnerSys Manual, Safety, Storage, Installation, Operation, and Maintenance Manual for Flooded Lead-Acid Batteries
EnerSys Manual, Instructions for Assembling and Maintaining Standard and Seismic Battery Racks, dated 10/2001
EnerSys Manual US-GNRACK-IM, Instructions for Assembling Class 1E Racks, dated 04/2004
EnerSys Document 183, Qualification Specification for EnerSys GN Series Cells, Rev. 2
EnerSys Drawing 83985/95, Two Step Rack Assembly Drawing, Rev. C
EnerSys Drawing NE00410-1, Test Layout for Seismic Qualification of GN-29 Cells, Rev. D
EnerSys Drawing 600256, Wiring Diagram; GN-29 w/ 4X SBE Connector, Rev. A
Westinghouse Document SV0-DB01-Z5-003, Appendix 3.0, Technical and Quality Requirements for Class 1E Batteries – Vogtle Unit 3 & 4, Rev. 0
Westinghouse Document APP-DB01-VPH-001, AP1000 Test Plan for Safety Related 250 VDC Batteries, Rev. 0
EnerSys Purchase Order 2400974 to Wyle Laboratories, dated 08/03/2011
Westinghouse Purchase Order 4500383567 to EnerSys, dated March 23, 2011

LIST OF INSPECTION PROCEDURES USED

IP 35007, "Quality Assurance Implementation during Construction and Pre-Construction Activities
65001.08, Inspection of ITAAC-Related Installation of Electric Components and Systems
65001.E, Inspection of the ITAAC-Related Qualification Program

LIST OF ACRONYMS

ADAMS System	Agency-wide Documents Access and Management
AP1000	Westinghouse Advanced Passive Reactor
COL	Combined License
DCD	Design Control Document
EPC	Engineering, Procurement, and Construction
Hz	Hertz
IEEE	Institute of Electrical and Electronics Engineers
ITAAC Criteria	Inspections, Tests, Analyses, and Acceptance
NRC	Nuclear Regulatory Commission
OBE	Operating Basis Earthquake
QA	Quality Assurance
SNC	Southern Nuclear Operating Company
SSE	Safe Shutdown Earthquake
Vdc	Volts Direct Current
VEGP	Vogtle Electric Generating Plant