



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 14, 2018

MEMORANDUM TO: Jennifer Dixon-Herrity, Chief  
Licensing Branch 4  
Division of Licensing, Siting,  
and Environmental Analysis  
Office of New Reactors

FROM: Paul Kallan, Senior Project Manager /RA/  
Licensing Branch 4  
Division of Licensing, Siting,  
and Environmental Analysis  
Office of New Reactors

SUBJECT: AUDIT PLAN FOR VOGTLE ELECTRIC GENERATING PLANT  
UNITS 3 AND 4, REQUEST FOR LICENSE AMENDMENT:  
CREDITING PREVIOUSLY COMPLETED FIRST PLANT AND  
FIRST THREE PLANT TESTS (LAR 18-019)

By letter dated August 3, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML18215A382), Southern Nuclear Operating Company (the licensee) requested an amendment to Combined License Numbers NPF-91 and NPF-92, for Vogtle Electric Generating Plant (VEGP) Units 3 and 4.

The requested amendment requires changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (DCD) Tier 2\* and Tier 2 information and related changes to the VEGP Units 3 and 4 Combined License (COL) and COL Appendix C (and corresponding plant-specific DCD Tier 1) information.

The requested amendment includes changes to credit previously completed first plant only and first three plant only testing as described in the licensing basis documents, including COL Condition 2.D.(2)(a) and plant-specific Tier 1 Section 2.1.3. Specifically, the proposed changes would revise the COL to delete conditions requiring the following tests: In-Containment Refueling Water Storage Tank (IRWST) Heatup Test, Reactor Vessel Internals Vibration Testing and Core Makeup Tank Heated Recirculation Tests. The documentation to establish a valid prototype reactor internals in accordance with Regulatory Guide 1.20, "Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Startup Testing" is also included.

CONTACT: Paul Kallan, NRO/DLSE/LB4  
301-415-2809

The Reactor Systems, Nuclear Performance & Code Review Branch (NRO/SRSB), the Containment and Ventilation Branch (NRO/SCVB), the Mechanical Engineering Branch (NRO/MEB), and the Quality Assurance Vendor Inspection Branch (NRO/QVIB) staff plan to conduct an audit to gain a better understanding of the proposed changes and to review related documentation and non-docketed information in order to evaluate conformance with the Standard Review Plan or technical guidance.

Docket Nos.: 52-025 and 52-026

Enclosure:  
Regulatory Audit Plan

cc: See next page

U.S. NUCLEAR REGULATORY COMMISSION AUDIT PLAN FOR VOGTLE ELECTRIC  
 GENERATING PLANT UNITS 3 AND 4 REQUEST FOR LICENSE AMENDMENT:  
 CREDITING PREVIOUSLY COMPLETED FIRST PLANT AND FIRST THREE PLANT TESTS  
 (LAR 18-019) DATED: SEPTEMBER 14, 2018

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 PKallan  
 RButler  
 JDixon-Herrity  
 KKavanagh

**ADAMS Accession No.: ML18256A323****NRO-008**

OFFICE	DLSE/LB4/PM	DLSE/LB4/LA	DLSE/LB4/BC
NAME	PKallan	RButler	JDixon-Herrity
DATE	9/14/18	9/14/18	9/14/18

**OFFICIAL RECORD COPY**

Vogtle Units 3 & 4 Mailing List

(Revised 01/09/2018)

cc:

Southern Nuclear Operating Company  
Document Control Coordinator  
42 Inverness Center Parkway, Bin 237  
Birmingham, AL 35242

Office of the Attorney General  
40 Capitol Square, SW  
Atlanta, GA 30334

Resident Manager  
Oglethorpe Power Corporation  
Alvin W. Vogtle Nuclear Plant  
7821 River Road  
Waynesboro, GA 30830

Anne F. Appleby  
Oglethorpe Power Corporation  
2100 East Exchange Place  
Tucker, GA 30084

County Commissioner  
Office of the County Commissioner  
Burke County Commission  
Waynesboro, GA 30830

Mr. Wayne Guilfoyle  
Commissioner District 8  
Augusta-Richmond County Commission  
4940 Windsor Spring Rd  
Hephzibah, GA 30815

Gwendolyn Jackson  
Burke County Library  
130 Highway 24 South  
Waynesboro, GA 30830

Mr. Reece McAlister  
Executive Secretary  
Georgia Public Service Commission  
Atlanta, GA 30334

Resident Inspector  
Vogtle Plant Units 3 & 4  
8805 River Road  
Waynesboro, GA 30830

Mr. Barty Simonton  
Team Leader  
Environmental Radiation Program  
Air Protection Branch  
Environmental Protection Division  
4244 International Parkway, Suite 120  
Atlanta, GA 30354-3906

George B. Taylor, Jr.  
2100 East Exchange Pl  
Atlanta, GA 30084-5336

Brian H. Whitley  
Regulatory Affairs Director  
Southern Nuclear Operating Company  
42 Inverness Center Parkway, BIN B237  
Birmingham, AL 35242

Mr. Michael Yox  
Site Regulatory Affairs Director  
Vogtle Units 3 & 4  
7825 River Road, Bin 63031  
Waynesboro, GA 30830

## Vogle Units 3 & 4 Mailing List

### Email

acchambe@southernco.com (Amy Chamberlian)  
agaughtm@southernco.com (Amy Aughtman)  
ALPUGH@southernco.com (Amanda Pugh)  
annacom@westinghouse.com (Michael J. Annacone)  
awc@nei.org (Anne W. Cottingham)  
becky@georgiawand.org (Becky Rafter)  
bhwhitley@southernco.com (Brian Whitley)  
Bill.Jacobs@gdsassociates.com (Bill Jacobs)  
bjadams@southernco.com (Brad Adams)  
bwwaites@southernco.com (Brandon Waites)  
castelca@westinghouse.com (Curtis Castell)  
comerj@westinghouse.com (James Comer)  
crenshjw@westinghouse.com (John Crenshaw)  
crpierce@southernco.com (C.R. Pierce)  
dahjones@southernco.com (David Jones)  
david.hinds@ge.com (David Hinds)  
david.lewis@pillsburylaw.com (David Lewis)  
dgboost@southernco.com (Danny Bost)  
dlfulton@southernco.com (Dale Fulton)  
drculver@southernco.com (Randy Culver)  
durhamdc@westinghouse.com (David Durham)  
ed.burns@earthlink.net (Ed Burns)  
edavis@pegasusgroup.us (Ed David)  
erg-xl@cox.net (Eddie R. Grant)  
fdhundle@southernco.com (Forrest Hundley)  
fhwillis@southernco.com (Fred Willis)  
G2NDRMDC@southernco.com (SNC Document Control)  
graysw@westinghouse.com (Scott W. Gray)  
jadwilli@southernco.com (J.D. Williams)  
james1.beard@ge.com (James Beard)  
jannina.blanco@pillsburylaw.com (Jannina Blanco)  
jantol1dj@westinghouse.com (David Jantosik)  
jenmorri@southernco.com (Jennifer Buettner)  
JHaswell@southernco.com (Jeremiah Haswell)  
jim@ncwarn.org (Jim Warren)  
John.Bozga@nrc.gov (John Bozga)  
Joseph\_Hegner@dom.com (Joseph Hegner)  
jpredd@southernco.com (Jason R. Redd)  
jranalli@meagpower.org (Jerry Ranalli)  
jtgasser@southernco.com (Jeff Gasser)  
karen.patterson@ttnus.com (Karen Patterson)  
karlg@att.net (Karl Gross)  
kdfili@southernco.com (Karen Fili)

## Vogle Units 3 & 4 Mailing List

kmstacy@southernco.com (Kara Stacy)  
KSutton@morganlewis.com (Kathryn M. Sutton)  
kwaugh@impact-net.org (Kenneth O. Waugh)  
lchandler@morganlewis.com (Lawrence J. Chandler)  
markus.popa@hq.doe.gov (Markus Popa)  
mdmeier@southernco.com (Mike Meier)  
mdrauckh@southernco.com (Mark Rauckhorst)  
media@nei.org (Scott Peterson)  
Melissa.Smith@Hq.Doe.Gov (Melissa Smith)  
Michael.Kuca@hq.doe.gov (Michael Kuca)  
mike.price@opc.com (M.W. Price)  
mlgraves@southernco.com (Michelle Graves)  
MSF@nei.org (Marvin Fertel)  
myox@southernco.com (Mike Yox)  
nirsnet@nirs.org (Michael Mariotte)  
Nuclaw@mindspring.com (Robert Temple)  
patriciaL.campbell@ge.com (Patricia L. Campbell)  
Paul@beyondnuclear.org (Paul Gunter)  
pbessette@morganlewis.com (Paul Bessette)  
r.joshi15@comcast.net (Ravi Joshi)  
rjarrett@southernco.com (Robyn Jarrett)  
RJB@NEI.org (Russell Bell)  
Ronald.Jones@scana.com (Ronald Jones)  
rwink@ameren.com (Roger Wink)  
sabinski@suddenlink.net (Steve A. Bennett)  
sara@cleanenergy.org (Sara Barczak)  
sblanton@balch.com (Stanford Blanton)  
Shiva.Granmayeh@hq.doe.gov (Shiva Granmayeh)  
sjackson@meagpower.org (Steven Jackson)  
skauffman@mpr.com (Storm Kauffman)  
sroetger@psc.state.ga.us (Steve Roetger)  
stephan.moen@ge.com (Stephan Moen)  
stephen.burdick@morganlewis.com (Stephen Burdick)  
tom.miller@hq.doe.gov (Tom Miller)  
TomClements329@cs.com (Tom Clements)  
Vanessa.quinn@dhs.gov (Vanessa Quinn)  
vcsummer2n3@gmail.com (Brian McIntyre)  
wasparkm@southernco.com (Wesley A. Sparkman)  
wayne.marquino@gmail.com (Wayne Marquino)  
weave1dw@westinghouse.com (Doug Weaver)  
x2gabeck@southernco.com (Gary Becker)  
x2kmseib@southernco.com (Kristin Seibert)

**AUDIT OF REPORTS AND CALCULATIONS IN SUPPORT OF A REQUEST FOR A LICENSE  
AMENDMENT RELATED TO CREDITING PREVIOUSLY COMPLETED FIRST PLANT AND  
FIRST THREE PLANT TESTS**

**SOUTHERN NUCLEAR OPERATING COMPANY  
VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4  
Docket Nos. 52-025 and 52-026**

The purpose of the audit is to review the reports and calculations needed by staff to verify the information and conclusions in the "Request for License Amendment: Crediting Previously Completed First Plant and First Three Plant Tests" (LAR 18-019) submitted by Southern Nuclear Operating Company (SNC) for the Vogtle Electric Generating Plant (VEGP), Units 3 and 4 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18215A382).

**A. Background:**

In License Amendment Request (LAR)18-019, SNC requires changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (DCD) Tier 2\* and Tier 2 information and related changes to the VEGP Units 3 and 4 Combined License (COL) and COL Appendix C (and corresponding plant-specific DCD Tier 1) information.

The LAR includes changes to credit previously completed first plant only and first three plant only testing as described in the licensing basis documents, including COL Condition 2.D.(2)(a) and plant-specific Tier 1 Section 2.1.3. Specifically, the proposed changes would revise the COL to delete conditions requiring the following tests: In-Containment Refueling Water Storage Tank (IRWST) Heatup Test, Reactor Vessel Internals Vibration Testing, and Core Makeup Tank Heated Recirculation Test. The documentation to establish a valid prototype reactor internals in accordance with Regulatory Guide 1.20, "Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Startup Testing" is also included.

**B. Regulatory Audit Basis**

This regulatory audit is based on the following:

- VEGP Unit 3, Current Facility Combined License NPF-91, Revised 09/11/2018, License Condition 2.D.(2)(a) (ADAMS Accession No. ML14100A106).
- VEGP Unit 4, Current Facility Combined License NPF-92, Revised 09/11/2018, License Condition 2.D.(2)(a) (ADAMS Accession No. ML14100A135).
- VEGP Units 3 and 4 Updated Final Safety Analysis Report, Revision 6 and Tier 1, Revision 5, August 11, 2017, Section 14.2.9.1.3 (ADAMS Accession No. ML17172A218).

**C. Regulatory Audit Scope and Methodology**

The audit team will view the calculations that provide the technical support for LAR-18-019. In addition, the audit team may potentially request to meet with subject matter expert(s) to discuss (1) potential differences between VEGP Units 3 and 4, and the plants for which testing has been

Enclosure

conducted, (2) quality assurance of the test data, and (3) physical phenomena observed in the test data.

#### **D. Information and Other Material Necessary for the Regulatory Audit**

The staff requests that the following documents, organized by review area, be made available to the staff either at a local office or in the electronic reading room:

##### General

- ND-EN-006-F01, "Sanmen 1&2 and Haiyang 1 First Plant Only and First 3 Plant Only Passive Core Cooling and Reactor System Tests"
- ND-EN-006-F01, "NRC IP 70367 Comparison to Sanmen and Haiyang Admin Procedures"
- HY1-PXS-T2R-504, "Partial Pre-Op Test Report for HY1-PXS-T1P-504"
- HY1-PXS-T2R-504S01, "Partial Pre-Op Test Report for HY1-PXS-T1P-504"
- SM1-PXS-T2R-504, "SM1-PXS-T1P-504 PXS HFT Report"

##### IRWST Heatup Test

- HY1-PXS-T2C-012, "HY1-PXS-T1P-504 Section 7.2 PRHR HX Heat Transfer Capability of IST Test Heat Transfer and Flow Calculation"
- HY1-PXS-T2C-013, "HY1-PXS-T1P-504 Section 7.4 PRHR HX Heat Removal Performance Test Heat Transfer and Flow Calculation"
- HY1-PXS-T2P-001, "Haiyang Unit 1 PXS HFT Results Validation for PRHR Performance"
- SM1-PXS-T2C-010, "SM1-PXS-T1P-504 Section 7.2 PRHR HX Force Flow Heat Transfer Capability Test"
- SM1-PXS-T2C-011, "SM1-PXS-T1P-504 Section 7.4 PRHR HX Natural Circulation Test"
- SM1-PXS-T2P-001, "Sanmen Unit 1 HFT Results Validation for PRHR Performance"

##### Reactor Vessel Internals Vibration Testing

- APP-CVAP-GER-003 (WCAP-17984), "CVAP Vibration Analysis Program for the AP1000 Plant"
- APP-CVAP-GER-004 (WCAP-17983), "CVAP Measurement and Inspection Programs for the AP1000 Plant"
- SM1-CVAP-T2R-100, "Sanmen 1 Pre-FT Visual Inspection Report of the AP1000 of AP1000 RVI"
- APP-GW-GLR-179, "CVAP Preliminary Report for the Sanmen 1 AP1000 Plant"



- APP-GW-GLR-181, “CVAP Final Report for the Sanmen 1 AP1000 Plant”
- SM1-CVAP-T2R-400, “Sanmen Unit 1 Post HFT Visual Inspection Report of the AP1000 RVI”
- SM1-RXS-T2R-50007, “SM1-RXS-T1P-502 RV Vibration Test Pre-Op Test Report”
- A comparison of as built dimensions must be made available.
  - Differences in as built dimensions in flow gaps that are significant may need to have CVAP data adjusted / extrapolated to account for the disparities.

Core Makeup Tank Heat Recirculation Tests

- APP-SSAR-GSC-810, “NOTRUMP Predictive Analysis of the CMT Recirculation, CMT Draindown, and ADS Blowdown Pre-Operational Tests”
- HY1-PXS-T2C-016, “HY1-PXS-T1P-504 Section 7.5 CMT Recirculation Test Results Comparison to Predictive Analysis”
- HY1-PXS-T2C-018, “HY1-PXS-T1P-504 Section 7.5 CMT Recirculation Test Flow Rate”
- SM1-PXS-T2C-012, “SM1-PXS-T1P-504 Section 7.5 CMT Recirculation Test Results Comparison to Predictive Analysis”
- SM1-PXS-T2C-013, “SM1-PXS-T1P-504 Section 7.5 CMT Recirculation Test Flow Rate”
- SM2-PXS-T2C-012, “SM2-PXS-T1P-504 Section 7.5 CMT Recirculation Test Results Comparison to Predictive Analysis”
- SM2-PXS-T2C-013, “SM2-PXS-T1P-504 Section 7.5 CMT Recirculation Test Flow Rate”
- HY1-PXS-T2C-019, “HY1-PXS-T1P-504 Section 7.7 CMT Draindown Test Results”
- SM1-PXS-T2C-014, “SM1-PXS-T1P-504 Section 7.7 CMT Draindown Test Results”
- SM2-PXS-T2C-014, “SM2-PXS-T1P-504 Section 7.7 CMT Draindown Test Results”

Other documents may be requested based on the staff’s review of the above documents.

Appropriate handling and protection of proprietary information shall be acknowledged and observed throughout the audit.

**E. Audit Team**

The following are the NRC audit team members:

Paul Kallan, Senior Project Manager (NRC), Lead  
 Timothy Drzewiecki, Reactor Systems Engineer (NRC), Technical Reviewer  
 Boyce Travis, Reactor Systems Engineer (NRC), Technical Reviewer

Chakrapani Basavaraju, Mechanical Engineer (NRC), Technical Reviewer  
Jeff Jacobson, Senior Reactor Operations Engineer (NRC), Technical Reviewer  
Aaron Armstrong, Reactor Operations Engineer (NRC), Technical Reviewer  
Yuken Wong, Senior Mechanical Engineer (NRC), Technical Reviewer  
Michael Breach, Mechanical Engineer (NRC), Technical Reviewer

The following are the licensee contacts:

Steve Leighty (SNC)  
Amy Chamberlain (SNC)

## **F. Logistics**

Date: September 17, 2018 – October 5, 2018

Location: Westinghouse Electric Company, LLC  
Washington Operations  
11333 Woodglen Drive, Suite 203  
Rockville, Maryland 20852  
Telephone: 301-881-7040/7042

Additionally, the review of documents supporting LAR-18-019, and identified in Section D of this audit plan, can be conducted at NRC Headquarters via the licensee's electronic reading room.

Location: NRC Headquarters  
Two White Flint North  
11545 Rockville Pike  
Rockville, MD 20852-2738

## **G. Special Requests**

If necessary, the staff requests that subject matter expert(s) be made available to discuss the (1) potential differences between VEGP Units 3 and 4, and the plants for which testing has been conducted, (2) quality assurance of the test data, and (3) physical phenomena observed in the test data.

Paul Kallan (NRC) is the lead for this audit. He can be reached at 301-415-2809 or Paul.Kallan@nrc.gov.

## **H. Deliverables**

At the completion of the audit, the staff will prepare an audit report within 45 days that will be declared and entered as an official agency record in ADAMS. The audit outcome may be used to identify any additional information to be submitted for making regulatory decisions, and will assist the staff in the issuance of RAIs (if necessary) in completing its review of LAR-18-019.