

Vogtle PEmails

From: Hughes, Brian
Sent: Friday, August 04, 2017 11:32 AM
To: Chamberlain, Amy Christine; Agquarle@southernco.com; Scarbrough, Thomas; Scarbrough, Thomas
Cc: Vogtle PEmails; Patel, Chandu; Dixon-Herrity, Jennifer; Lupold, Timothy
Subject: RE: LAR-17-009 PXS/ADS Line Resistance Changes - Audit Plan
Attachments: Vogtle LAR-17-009 Audit Plan 8-03-2017.docx

Amy,

Attached find the LAR-17-009 Audit Plan. If you have any questions please contact me.

Thank you,

Brian Hughes
Senior Project Manager
NRO/DNRL/LB4
US NRC
301-415-6582

From: Chamberlain, Amy Christine [mailto:ACCHAMBE@southernco.com]
Sent: Thursday, August 03, 2017 3:30 PM
To: Hughes, Brian <Brian.Hughes@nrc.gov>
Cc: Quarles, Adam Graham <>
Subject: [External_Sender] LAR-17-009 PXS/ADS Line Resistance Changes - Draft Audit Plan

Hi Brian,

This email is in response to your phone call requesting my email address to send the draft audit plan for LAR-17-009 PXS/ADS Line Resistance Changes. Please feel free to contact myself or Adam Quarles.

Thank you,

Amy Chamberlain, P.E.

Licensing Supervisor – VEGP 3&4 Construction
Nuclear Development Regulatory Affairs
Southern Nuclear Company
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Birmingham, AL 35242
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Hearing Identifier: Vogtle_COL_Docs_Public
Email Number: 136

Mail Envelope Properties (a0287ccb60774783a9d17f535ab0b058)

Subject: RE: LAR-17-009 PXS/ADS Line Resistance Changes - Audit Plan
Sent Date: 8/4/2017 11:32:21 AM
Received Date: 8/4/2017 11:32:22 AM
From: Hughes, Brian

Created By: Brian.Hughes@nrc.gov

Recipients:

"Vogtle PEmails" <Vogtle.PEmails@nrc.gov>
Tracking Status: None
"Patel, Chandu" <Chandu.Patel@nrc.gov>
Tracking Status: None
"Dixon-Herrity, Jennifer" <Jennifer.Dixon-Herrity@nrc.gov>
Tracking Status: None
"Lupold, Timothy" <Timothy.Lupold@nrc.gov>
Tracking Status: None
"Chamberlain, Amy Christine" <ACCHAMBE@southernco.com>
Tracking Status: None
"Agquarle@southernco.com" <Agquarle@southernco.com>
Tracking Status: None
"Scarborough, Thomas" <Thomas.Scarborough@nrc.gov>
Tracking Status: None
"Scarborough, Thomas" <Thomas.Scarborough@nrc.gov>
Tracking Status: None

Post Office: HQPWMSMRS01.nrc.gov

Files	Size	Date & Time
MESSAGE	1103	8/4/2017 11:32:22 AM
Vogtle LAR-17-009 Audit Plan 8-03-2017.docx		26777
image001.gif	2074	

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

AUDIT OF REPORTS AND CALCULATIONS IN SUPPORT OF REQUEST FOR LICENSE AMENDMENTS AND EXEMPTIONS RELATED TO PXS/ADS LINE RESISTANCE CHANGES

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

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

Purpose:

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 and Exemption: PXS/ADS Line Resistance Changes (LAR-17-009)" submitted by Southern Nuclear Operating Company (SNC) for the Vogtle Electric Generating Plant (Vogtle), Units 3 and 4, in LAR-17-009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17090A209).

Background:

In LAR-17-009, SNC proposes to depart from approved AP1000 Design Control Document (DCD) Tier 2 information (text and tables) as incorporated into the Updated Final Safety Analysis Report (UFSAR) as plant-specific DCD information, and also proposes to depart from involved plant-specific Tier 1 information (and associated COL Appendix C information). Pursuant to the provisions of 10 CFR 52.63(b)(1), an exemption from elements of the design as certified in the 10 CFR Part 52, Appendix D, design certification rule is also requested for the plant-specific Tier 1 material departures.

The requested amendment proposes changes to UFSAR Tier 2 and COL Appendix C (and plant-specific Tier 1) in regards to the passive core cooling system (PXS) low pressure injection and fourth-stage automatic depressurization system (ADS) flow resistances. This includes proposed changes to ITAAC and UFSAR information in various locations.

The NRO Projects staff determined that an audit of the reports and calculations supporting this LAR is the appropriate method to verify this proposed change rather than by issuing multiple rounds of requests for additional information (RAIs).

Regulatory Audit Basis:

10 CFR 52.98(c) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. The proposed changes involve a change to COL Appendix C (and plant-specific DCD Tier 1) Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) information. Therefore, NRC approval is required prior to making the plant-specific proposed changes in this license amendment request.

10 CFR 52, Appendix D, Section VIII.B.5.a allows an applicant or licensee who references this

appendix to depart from Tier 2 information, without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2* information, or the Technical Specifications, or requires a license amendment under paragraphs B.5.b or B.5.c of the section.

10 CFR 50.46(b) requires:

1. The maximum fuel element cladding temperature not exceed 2200°F;
2. The calculated total oxidation of fuel cladding shall not exceed 0.17 times the total cladding thickness before oxidation;
3. The calculated total amount of hydrogen generated from the reaction of cladding with steam or water not exceed one percent of the amount of hydrogen generated should the entirety of fuel cladding react;
4. The reactor core remain amenable to cooling; and
5. The calculated core temperature be maintained at an acceptably low value for the extended time required by long-lived radioactivity decay heat.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 2 requires that structures, systems, and components important to safety be designed to withstand the effects of natural phenomena, such as earthquakes.

10 CFR Part 50, Appendix A, GDC 4 requires that systems structures and components can withstand the dynamic effects associated with missiles, pipe whipping, and discharging fluids, excluding dynamic effects associated with pipe ruptures, the probability of which is extremely low under conditions consistent with the design basis for the piping.

10 CFR Part 50, Appendix A, GDC 35 requires that a system to provide abundant emergency core cooling be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

10 CFR Part 50, Appendix A, GDC 36 requires that the emergency core cooling system be designed to permit appropriate periodic inspection of important components, such as spray rings in the reactor pressure vessel, water injection nozzles, and piping, to assure the integrity and capability of the system.

10 CFR Part 50, Appendix A, GDC 37 requires that the emergency core cooling system be designed to permit appropriate periodic pressure and functional testing to assure (1) the structural and leak tight integrity of its components, (2) the operability and performance of the active components of the system, and (3) 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, including operation of applicable portions of the protection system, the transfer between normal and emergency power sources, and the operation of the associated cooling water system.

The NRC staff will follow NRO Office Instruction NRO-REG-108 (Revision 0), "Regulatory Audits," (ADAMS Accession No. ML081910260) in performing the audit of the reports and calculations cited below.

Regulatory Audit Scope:

The primary scope of this audit is the review of the test data, calculations, and analyses referenced in LAR-17-009 to support the proposed changes to the UFSAR Tier 2 and COL Appendix C (and plant-specific Tier 1) in regards to the passive core cooling system (PXS) low pressure injection and fourth-stage automatic depressurization system (ADS) flow resistances. The specific items of review are indicated below:

1. Justification for the process described in Section 3.1 of LAR-17-009 for revising the flow resistances for the IRWST injection and containment recirculation check valves.
2. Justification for the process described in Section 3.2 of LAR-17-009 for revising the flow resistances for the fourth-stage ADS lines and IRWST drain lines.
3. Adequacy of the sensitivity analysis referenced in Section 3.3 of LAR-17-009 for the limiting small-break LOCA (SBLOCA) safety analysis to conservatively estimate the effect of the proposed changes.
4. Adequacy of the evaluation of the impact of the increased line resistances on the large-break LOCA (LBLOCA) analyses and long-term core cooling (LTCC) referenced in Section 3.3 of LAR-17-009.
5. Adequacy of the evaluation of the impact of the fourth-stage ADS line resistance increase on the LBLOCA containment integrity (peak pressure) calculations referenced in Section 3.4 of LAR-17-009.
6. Adequacy of the evaluation of the flow resistance changes on non-LOCA transients and events including the justification for stating the changes does not adversely affect the non-LOCA safety analysis results as referenced in Section 3.5 of LAR-17-009.
7. Adequacy of the evaluation of the flow resistance changes on loss of normal residual heat removal system (RNS) during normal shutdown referenced in Section 3.6 of LAR-17-009.
8. Adequacy of the evaluation of the flow resistance changes on severe accident mitigation referenced in Section 3.7 of LAR-17-009.
9. Adequacy of the flow resistance tests planned to satisfy the proposed ITAAC revisions described in Section 3.8 of LAR-17-009.

Documents and Information Necessary for the Audit:

The following documents are to be made available to the NRC staff either at a local office or in the electronic reading room:

1. Functional requirement documents, valve supplier data and data sheets, valve performance test data, computational fluid dynamics analysis, line resistance calculations, and safety analyses referenced in Section 3.1 of LAR-17-009 for the IRWST injection and containment recirculation check valves.
2. Flow resistance methodology and calculations referenced in Section 3.2 for the fourth-stage ADS and IRWST drain lines.

3. Sensitivity analysis for the SBLOCA, and updated LBOCA and LTCC calculations in regards to UFSAR Section 15.6.5 discussed at the beginning of Section 3 and referenced in Section 3.3 of LAR-17-009.
4. LBLOCA containment integrity (peak pressure) calculations referenced in Section 3.4 of LAR-17-009.
5. Documentation of the evaluation of the potential impact on non-LOCA safety analyses referenced in Section 3.5 of LAR-17-009.
6. Documentation of the evaluation of the potential impact on the loss of the RNS during normal shutdown referenced in Section 3.6 of LAR-17-009.
7. Documentation of the evaluation of the potential impact on severe accident mitigation referenced in Section 3.7 of LAR-17-009.
8. Test plans to verify the line flow resistance and design documents discussed in Section 3.8 of LAR-17-009.

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

Audit Staff:

Donald E. Palmrose, Senior Reactor Engineer (NRC)
Thomas G. Scarbrough, Senior Mechanical Engineer (NRC)
Brian Hughes, Senior Project Manager (NRC)

Licensee Contacts:

Adam G. Quarles (SNC)
Amy Chamberlain (SNC)

Audit Activities and Deliverables:

The NRC staff will address in the audit report the technical areas identified in the Regulatory Audit Scope of this audit plan along with presenting the audit outcomes.

The audit will be conducted in support of the schedule for completion of the LAR-17-009 review with entrance and exit dates to be determined. The level of effort is estimated to be a total of 80 hours to perform the audit and issue the audit report.

Depending on the availability of the licensee's documentation, the audit is planned to be conducted between August 22, 2017, and September 26, 2017. The audit is intended to be conducted from the NRC Headquarters via the licensee's electronic reading room; however, the audit may be performed at a local office of the licensee, if the technical information is only retained in hard copy.

The NRC staff acknowledges the proprietary nature of the information requested. It will be handled appropriately throughout the audit. While the NRC staff will take notes, the staff will not remove hard copies or copy electronic files.

At the completion of the audit, the NRC 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 NRC staff in the issuance of RAIs (if necessary) in completing its review of LAR-17-009.. With the planned exit telecom on September 26, 2017, the audit report will be completed by November 10, 2017.

If necessary, any circumstances related to the performance of the audit will be communicated to Brian Hughes (NRC) at 301-415- 6582 or Brian.Hughes@nrc.gov.

