



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

January 23, 2019

Ms. Cheryl A. Gayheart  
Regulatory Affairs Director  
Southern Nuclear Operating Co., Inc.  
3535 Colonnade Parkway  
Birmingham, AL 35243

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2 – REGULATORY  
AUDIT FOR THE REVIEW OF LICENSE AMENDMENT REQUESTS TO  
ADOPT THE RISK-INFORMED PROVISIONS OF TITLE 10 OF THE *CODE OF  
FEDERAL REGULATIONS*, PARAGRAPHS 50.48(c) AND 50.69 (EPID NOS.  
L-2018-LLA-0107 AND L-2018-LLA-0175)

Dear Ms. Gayheart:

By separate applications dated April 4, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18096A936), and June 7, 2018 (ADAMS Accession No. ML18158A583), Southern Nuclear Operating Company (SNC) submitted two license amendment requests (LARs) for the Edwin I. Hatch Nuclear Plant (HNP), Unit Nos. 1 and 2. In the first LAR, dated April 4, 2018, SNC proposed to adopt National Fire Protection Association Standard 805 (NFPA 805), "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition (ADAMS Accession No. ML010800360), as incorporated into Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.48(c). In the second LAR, dated June 7, 2018, SNC proposed to adopt 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors."

To support the review of the proposed license amendments, an audit team consisting of U.S. Nuclear Regulatory Commission (NRC) staff from the Office of Nuclear Reactor Regulation, Division of Risk Assessment (DRA), will be conducting a regulatory audit at the HNP site the week of March 18, 2019, as previously discussed with your staff. NRC staff from the DRA Probabilistic Risk Assessment Licensing Branches A and B, and NRC contractors from the Pacific Northwest National Laboratory will perform the audit. NRC regional staff may also be present as observers. The audit plan for both reviews is provided in the enclosure to this letter.

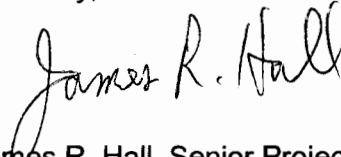
The NRC staff will be sending a draft request for additional information (RAI) in support of the audit under separate cover. In accordance with the schedule in the audit plan, we will be contacting your staff to set up a teleconference to discuss the draft RAIs and audit logistics.

C. Gayheart

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If you have any questions, please contact me at (301) 415-4032, or [Randy.Hall@nrc.gov](mailto:Randy.Hall@nrc.gov).

Sincerely,

A handwritten signature in black ink that reads "James R. Hall". The signature is written in a cursive style with a large, stylized "J" and "H".

James R. Hall, Senior Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure: Audit Plan

cc: Listserv

SOUTHERN NUCLEAR OPERATING COMPANY,  
EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2  
REGULATORY AUDIT FOR THE REVIEW OF LICENSE AMENDMENT REQUESTS TO  
IMPLEMENT A RISK-INFORMED, PERFORMANCE-BASED, FIRE PROTECTION PROGRAM  
AS ALLOWED BY TITLE 10 OF THE CODE OF FEDERAL REGULATIONS,  
PARAGRAPH 50.48(c), AND TO ADOPT 10 CFR 50.69, RISK-INFORMED CATEGORIZATION  
AND TREATMENT OF STRUCTURES, SYSTEMS AND COMPONENTS  
FOR NUCLEAR POWER REACTORS  
(EPID NOS. L-2018-LLA-0107 AND L-2018-LLA-0175)

**1.0    BACKGROUND**

Southern Nuclear Operating Company (SNC) has submitted two license amendment requests (LARs); the first, submitted on April 4, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18096A936), proposing to change the Edwin I. Hatch Nuclear Plant (HNP), Unit Nos. 1 and 2, fire protection program (FPP) to one based on the National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, as incorporated into Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.48(c) (the NFPA 805 LAR); and the second, submitted on June 7, 2018 (ADAMS Accession No. ML18158A583), proposing to adopt the 10 CFR 50.69 risk-informed (RI) categorization and treatment of structures, systems and components for nuclear power reactors (the 50.69 LAR).

The U. S. Nuclear Regulatory Commission (NRC) staff's review of both LARs has commenced in accordance with the Office of Nuclear Reactor Regulation's (NRR) Office Instruction LIC-101, "License Amendment Review Procedures." The NRC staff has determined that a regulatory audit should be conducted in accordance with the NRR Office Instruction LIC-111, "Regulatory Audits," for the staff to gain a better understanding of the licensee's probabilistic risk assessment (PRA) models, calculations, proposed plant modifications, overall 10 CFR 50.59 categorization process, and other aspects of both LARs.

A regulatory audit is a planned, license-related or regulation-related activity that includes the examination and evaluation of primarily non-docketed information. A regulatory audit is conducted with the intent to gain understanding, to verify information, and/or to identify information that will require docketing to support the basis of the licensing or regulatory decision. Performing a regulatory audit of the licensee's information is expected to assist the NRC staff in efficiently conducting its review or gain insights on the licensee's processes or procedures. Information that the NRC staff relies upon to make the safety determination must be submitted on the docket. However, there may be supporting information retained as records

under 10 CFR 50.71, "Maintenance of records, making of reports," and/or 10 CFR 54.37, "Additional records and record-keeping requirements," which although not required to be submitted as part of the licensing action, would help the staff better understand the licensee's submitted information.

The objectives of this regulatory audit for the NFPA 805 LAR are to:

- Gain a better understanding of the detailed calculations, analyses and bases underlying the NFPA 805 LAR and confirm the staff's understanding of the LAR;
- Identify further information that is necessary for the licensee to submit for the NRC staff to reach a licensing or regulatory decision, and discuss requests for additional information (RAIs);
- Verify that the licensee's planned process for self-approval of FPP changes will meet the proposed NFPA 805 license condition and quality requirements;
- Establish an understanding of proposed plant modifications necessary to implement NFPA 805; and,
- Verify the implementation of processes and/or procedures that the licensee described in its LAR.

The objectives of this regulatory audit for the 50.69 LAR are to:

- Validate that the technical elements of the internal events, internal flooding and the fire PRA (FPRA) are acceptable;
- Obtain a more detailed understanding of the technical adequacy of the seismic PRA (SPRA) model credited in the LAR;
- Review the unique aspects of using the SPRA in the RI categorization process;
- Review the key assumptions and sources of uncertainty;
- Confirm that the non-PRA methods used for evaluating the risk from external hazards are consistent with those allowed in Nuclear Energy Institute (NEI) 00-04, "10 CFR 50.69 SSC Categorization Guideline," (ADAMS Accession No. ML052900163), and appropriately consider the current as-built, as-operated plant;
- Identify further information that is necessary for the licensee to submit for the NRC staff to reach a licensing or regulatory decision, and discuss RAIs.

## **2.0 REGULATORY AUDIT BASIS**

The bases for this audit are: the applicable regulations contained in 10 CFR 50.48 and 10 CFR 50.69; the licensee's LARs; NFPA 805, 2001 edition; the NRC Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, NUREG-0800, Section 9.5.1.2. "Risk-Informed, Performance-Based Fire Protection Program," (ADAMS

Accession No. ML092590527); and various Regulatory Guides, including RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," (ADAMS Accession No. ML 17317A256), RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," (ADAMS Accession No. ML090410014), RG 1.201, "Guidelines For Categorizing Structures, Systems, And Components In Nuclear Power Plants According To Their Safety Significance," (ADAMS Accession No. ML061090627), and RG 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," (ADAMS Accession No. ML092730314); NRC Inspection Manual Procedure 37060; and the final rule published in the Federal Register, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," dated November 22, 2004 (69 FR 68007).

### **3.0 REGULATORY AUDIT SCOPE OR METHOD**

#### **3.1 10 CFR 50.48(c) (NFPA 805)**

The team will review the licensee's NFPA 805 transition as proposed in the LAR. Key to this effort is the licensee's Risk-Informed, Performance-Based Fire Protection Program (RI/PB FPP). The team will review the fundamental FPP elements and minimum design requirements. A sample of fire protection engineering evaluations (FPEEs) may be selected for review. In addition, the team will review, as necessary, the regulatory basis, references, licensing actions, existing engineering equivalency evaluations, and issues that the licensee has deemed "previously approved."

The scope of the review of nuclear safety performance criteria may include both at-power and non-power operational modes, and may require a sample of procedures and other documentation. The compliance by fire area review will, as necessary, include multiple spurious operations, the transition of operator manual actions to recovery actions (RAs), FPEEs, and NFPA 805 deterministic requirements. The team may also include alternatives to compliance with NFPA 805, if any are identified.

The team may review a sample of fire risk assessments and plant change evaluations for one or more fire areas, the evaluation of the additional risk of RAs, the licensee's process for self-approving post-transition FPP changes, cumulative risk and combined changes, as well as uncertainty and sensitivity analyses. The review may also include licensee RI evaluations to ensure that defense-in-depth and safety margins have been evaluated.

The team will also review the licensee's assessment of the technical adequacy of the PRA model used for any risk evaluations required to transition to a RI/PB FPP, including resolution of peer review findings and licensee self-assessments. This effort may include auditing a sample of logic models and calculations in the FPRA model as well as the internal events PRA (IEPRA) model. The review will include, as necessary, the licensee's process that has or will be implemented to maintain the quality of the IEPRA and FPRA models to support self-approval of RI change evaluations after transition is completed.

The scope may also include the licensee's NFPA 805 monitoring program, which is to establish and monitor acceptable levels of availability, reliability, and performance of fire protection systems and features relied upon for NFPA 805 compliance.

The scope would include, as appropriate, selected plant modifications to confirm they have been appropriately characterized in the LAR. The team may review the process for controlling compensatory measures to confirm their adequacy while they remain in effect until the modifications are completed.

In addition, the audit team will review program documentation, configuration control, and the FPP quality assurance program. The FPP design basis document may be reviewed, as well as other documentation of fire hazards identification and nuclear safety capability assessments. The review may include configuration control of the FPP design basis document, the FPRA methods and model, and other relevant documentation as necessary. The team may also review the FPP quality assurance program, and sample fire models and fire modeling (FM) calculations. Plant walkdowns may be performed as necessary to observe features of the licensee's FPP and design elements of buildings within the power block.

### 3.2 10 CFR 50.69

The team will review the 10 CFR 50.69 categorization process to gain a more detailed understanding of it and verify conformance of the process with the regulations and NRC-endorsed guidance, as applicable. The staff will confirm that any non-PRA methods proposed for use in the categorization process are consistent with those allowed in NEI 00-04 as endorsed, with clarifications in RG 1.201 Revision 1.

The team will review the technical adequacy of the PRA models for use in the application and identify any new information that is needed in order for the NRC staff to reach a regulatory decision.

### 3.3 Requests for Additional Information

Upon completion of this audit, the NRC staff will develop and issue final RAIs, as needed, to allow the staff to complete the LAR review, and the licensee will be expected to provide the necessary information on the docket. The final RAIs will be issued after the audit.

## 4.0 INFORMATION AND OTHER MATERIAL NECESSARY FOR THE AUDIT

The NRC audit team will require access to licensee personnel knowledgeable regarding the technical aspects of the HNP NFPA 805 and 50.69 LARs. At a minimum, a hardcopy and electronic copy of the following documentation should be available to the audit team:

- Calculation models and supporting documentation for PRA models used in support of the LARs, including peer review history and resolution and closure of peer review findings;
- Calculation models and supporting documentation for fire models used in support of the LARs;
- Procedures that have been modified or developed to transition to the NFPA 805 licensing basis;
- Procedures that have been modified or developed to maintain the NFPA 805 licensing basis after transition is completed;

- Documentation of changes made to PRA models in support of change analysis;
- Documentation about PRA configuration control and procedures to support self-approval of RI plant changes after transition;
- Documentation of plant modifications or operational changes identified, screened, and considered (or planned for) during the licensee's transition to NFPA 805;
- Calculations and evaluations used to transition to NFPA 805 such as plant change evaluations, engineering equivalency evaluations, and RA evaluations;
- 50.69 draft categorization procedures, if available;
- Any 50.69 categorization results, if available;
- PRA documentation on key assumptions and sources of uncertainty for the IEPRA and the FPRA;
- Other documents that the licensee deems necessary to support the NRC staff's audit team, as outlined under audit activities;
- SPRA Peer Review Report;
- SPRA Self-Assessment Report;
- SPRA Walkdown Report;
- SPRA Human Reliability Analysis Notebook;
- SPRA Seismic Equipment List Notebook;
- SPRA Seismic Plant Response Notebook;
- SPRA Quantification Notebook;
- Any other documents that include discussions on key assumptions and sources of uncertainty for the SPRA with licensee dispositions relevant to the LAR.

## **5.0 TEAM ASSIGNMENTS**

The audit will be conducted by NRC staff from the Office of Nuclear Reactor Regulation, Division of Risk Assessment (DRA), PRA Licensing Branches A and B (APLA and APLB), who are knowledgeable in PRA, safe shutdown and circuit analysis, FM, and fire protection engineering. Contractors from the Pacific Northwest National Laboratory will support the technical audit team members. NRC staff from other organizations may be assigned to the team as appropriate and others may participate as observers. Observers at the audit may include NRR Project Managers and various Regional Inspectors.

The NRC Audit Team Leader will be Leslie Fields and the NRC Technical Leads will be Jay Robinson (NFPA 805) and Mehdi Reisi-Fard (50.69 LAR). The audit team leader will conduct daily briefings on the status of the review and coordinate audit activities while on site. The tables below show: (1) audit milestones and schedule, and (2) planned audit team composition and assigned areas for review during the audit.

| Audit Milestones and Schedule       |                            |  |
|-------------------------------------|----------------------------|--|
| Activity                            | Time Frame                 | Comments   |
| Audit Scheduling/Clarification Call | Week of 2/04/2019 or later | Teleconference to provide clarification of audit questions.  |
| Onsite Audit Kick-Off Meeting       | 03/18/2019                 | NRC will present a brief team introduction and discuss the scope of the audit. The licensee should introduce team members and give logistics for the week. In addition, the licensee should be prepared to give a virtual tour of the protected area in the plant. |
| Onsite Escorted Tour                | 03/19/2019                 | Tours of risk significant power block areas. Additional tours will be requested if needed.   |
| End of Day Summary Briefing         | 03/18/2019 – 03/21/2019    | Meet with licensee to provide a summary of any significant findings and RAI assistance.  |
| Provide Break-out Areas             | 03/18/2019 – 03/21/2019    | Facilitate discussion between site and staff technical areas.  |
| Onsite Audit Exit Meeting           | 03/22/2019                 | NRC staff will hold a brief exit meeting, with licensee staff to conclude audit activities.  |
| Audit Summary (see 8.0)             | 90 days after exit         | To document the audit.   |

| NFPA 805 Regulatory Audit Team and Assignments |   |             |           |
|--|---|-------------|-----------|
| SRP 9.5.1.2 Section                            | Audit Plan Review Areas                       | Lead        | Support   |
| III.1.2  | Modifications                                 | Team        | Team      |
| III.1.3  | Licensee self-approval                        | J. Robinson | Team      |
| III.2  | Fundamental FPP and Design Elements           | B. Metzger  | Team      |
| III.3.1.2                                      | Multiple spurious operation                   | T. Dinh     | Team      |
| III.3.2  | Engineering evaluations, previous approval    | Team        | Team      |
| III.3.2.2                                      | Operations guidance for FM PB methods         | N. Iqbal    | Team      |
| III.3.2.2                                      | Recovery Actions                              | Team        | Team      |
| III.3.3  | Non-power operation                           | T. Dinh     | Team      |
| III.5.3-5.6                                    | Risk assessments                              | J. Hyslop   | G. Coles  |
| III.5.1  | PRA technical adequacy                        | J. Hyslop   | G. Coles  |
| III.5.2  | Defense in depth and safety margins           | Team        | Team      |
| III.6  | Monitoring program                            | J. Robinson | Team      |
| III.7.1-7.3                                    | Documentation, Configuration Control, Quality | J. Robinson | Team      |
|  | Plant walk-down Coordinator                   | L. Fields   | As needed |



| 50.69 Regulatory Audit Team and Assignments |   |             |                |
|---|---|-------------|----------------|
|   |   | <b>Lead</b> | <b>Support</b> |
| 1   | Categorization Process                        | Team        | G. Coles       |
| 2   | PRA Technical Adequacy                        | Team        | G. Coles       |
| 2.a   | Peer Reviews                                  | Team        | G. Coles       |
| 2.b   | Facts and Observations                        | Team        | G. Coles       |
| 2.c   | PRA updates/upgrades                          | Team        | G. Coles       |
| 3   | External Hazards                              | Team        | G. Coles       |
| 4   | Integrated Decision-making Panel              | Team        | G. Coles       |
| 5   | Documentation, Configuration Control, Quality | Team        | G. Coles       |
| 6   | Seismic PRA                                   | Team        | G. Coles       |

## 6.0 LOGISTICS

This regulatory audit is planned for the week of March 18-22, 2019, and will last approximately 5 days. A conference call will be scheduled one to two weeks prior to the audit to discuss the details of the audit plan. The dates in the milestone chart are subject to change based on mutual agreement between the licensee and the NRC. An entrance meeting for this audit will be held on the first day at 9:00 AM and an exit meeting will be held the final audit day at 12:00 noon or based on a mutually agreed upon time after receipt of this audit plan. The NRC audit team leader will provide daily progress reports to licensee personnel on the second and third days of the audit.

The audit will take place at a location agreed upon by the licensee and the NRC audit team leader where: (1) the necessary reference material, and (2) appropriate analysts will be available to support the review. Because the audit scope includes NRC staff walkdowns of selected plant areas in the protected area, the audit must be conducted in a location that allows for travel to the plant's protected area for escorted access. Visitor access will be requested for the entire audit team. The NRC staff recommends that security paperwork and processing be handled upon arrival on the first day of the audit week.

## 7.0 SPECIAL REQUESTS

The NRC audit team will require the following to support the regulatory audit:

- Visitor access/ badging will be needed for all team members participating in the plant tour.
- Two computers with internet access and printing capability in the NRC room, access to the site portal, and wired or wireless internet access.
- Four private conference rooms (preferably outside the plant protected area) with conference calling capability should be made available. The main NRC conference room should be set up for 15-18 NRC staff and contractors. An additional conference room should be able to accommodate up to 20 people for PRA technical discussions. And two more rooms should be arranged for up to 10 people for fire protection engineering, safe shutdown and circuit analysis, and FM technical discussions.

- Access to the FPP documentation, including but not limited to: plant drawings depicting fire area boundaries, the Fire Hazards Analysis, safe shutdown analysis, FPRA Models, and the IEPPRA and FPRA.
- Access to licensee personnel knowledgeable in the FPP, FM, safe shutdown and circuit analysis, FPRA, IEPPRA, and SPRA, non-power operations, radiological release analysis, and the NFPA 805 fire protection design-basis document.

## **8.0 DELIVERABLES**

A regulatory audit summary will be issued within approximately 90 days after the completion of the audit. The summary will use the guidance of NRR Office Instruction LIC-111 for content. Formal RAs will be sent separately to the licensee from NRR's Division of Operating Reactor Licensing after the audit. The audit summary will be placed ADAMS.

**SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2 – REGULATORY AUDIT FOR THE REVIEW OF LICENSE AMENDMENT REQUESTS TO ADOPT THE RISK-INFORMED PROVISIONS OF TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, PARAGRAPHS 50.48(c) AND 50.69 (EPID NOS. L-2018-LLA-0107 AND L-2018-LLA-0175) DATED JANUARY 23, 2019**

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**ADAMS Accession No. ML19018A231****\*via e-mail**

| OFFICE | DORL/LPL2-1/PM | DORL/LPL2-1/LA | DRA/APLB/BC* | DORL/LPL2-1/BC | DORL/LPL2-1/PM        |
|--------|----------------|----------------|--------------|----------------|-----------------------|
| NAME   | JHall          | KGoldstein     | GCasto       | MMarkley       | JHall (SWilliams for) |
| DATE   | 1/22/19        | 1/22/19        | 1/17/19      | 1/23/19        | 1/23/19               |

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