



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

March 27, 2015

Vice President, Operations
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 1 - REGULATORY AUDIT PLAN FOR APRIL 20-23, 2015, AUDIT IN SUPPORT OF THE LICENSE AMENDMENT REQUEST TO IMPLEMENT RISK-INFORMED, PERFORMANCE-BASED, FIRE PROTECTION PROGRAM AS ALLOWED BY TITLE 10 OF *THE CODE OF FEDERAL REGULATIONS*, PARAGRAPH 50.48(c) (TAC NO. MF3419)

Dear Sir or Madam:

By letter dated January 29, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14029A438), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request to the U.S. Nuclear Regulatory Commission (NRC) to transition its fire protection licensing basis for Arkansas Nuclear One, Unit 1 (ANO-1) from Title 10 of the *Code of Federal Regulations* (CFR) paragraph 50.48(b) to 10 CFR 50.48(c), National Fire Protection Association Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.

The NRC staff is reviewing the application and has determined that a regulatory audit should be conducted in accordance with the Office of Nuclear Reactor Regulation Instruction LIC-111, "Regulatory Audits," in an effort to gain a better understanding of the licensee's calculations, proposed plant modifications, and other aspects of the license amendment request.

The audit will be performed at ANO-1 during the week of April 20, 2015. A copy of the related audit plan is enclosed.

- 2 -

If you have any questions, please contact me at (301) 415-1081 or by e-mail at Andrea.George@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. George', with a large, stylized flourish at the end.

Andrea E. George, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosure:
Regulatory Audit Plan

cc w/encl: Distribution via Listserv



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

REGARDING THE NATIONAL FIRE PROTECTION ASSOCIATION

STANDARD 805 LICENSE AMENDMENT REQUEST

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO. 1

DOCKET NO. 50-313

1.0 BACKGROUND

By letter dated January 29, 2014 (Reference 1), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request (LAR) to the U.S. Nuclear Regulatory Commission (NRC) to transition its fire protection licensing basis for Arkansas Nuclear One, Unit 1 (ANO-1) from Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.48(b) to 10 CFR 50.48(c), National Fire Protection Association Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.

The NRC staff is reviewing the application and has determined that a regulatory audit should be conducted in accordance with the Office of Nuclear Reactor Regulation Instruction LIC-111, "Regulatory Audits," in an effort to gain a better understanding of the licensee's calculations, proposed plant modifications, and other aspects of the LAR.

A regulatory audit is a planned license 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 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 are to:

- Gain a better understanding of the detailed calculations, analyses and bases underlying the NFPA 805 LAR and confirm the NRC staff's understanding of the LAR;

Enclosure

- Discuss requests for additional information (RAIs);
- Verify that the licensee's planned process for self-approval of fire protection program (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 committed to as part of NFPA 805 implementation.

2.0 REGULATORY AUDIT BASIS

The basis of this audit is the licensee's LAR and NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (SRP) Section 9.5.1.2, "Risk-Informed, Performance-Based Fire Protection" (RI/PB FPP) (Reference 2). References 3 through 7 provide additional information that will be used to support the audit.

3.0 REGULATORY AUDIT SCOPE OR METHOD

The team will review the licensee's NFPA 805 transition as proposed in the LAR. Key to this effort is the licensee's RI/PB FPP. The team will review the fundamental FPP elements and minimum design requirements. A sample of fire protection engineering evaluations 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), fire protection engineering evaluations, 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 risk-informed 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 probabilistic risk assessment (PRA) model used for any risk evaluations required to transition to an 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 fire PRA (FPRA)

model as well as the Internal Events PRA model. The review will include, as necessary, the licensee's process that has or will be implemented to maintain the quality of the Internal Events PRA and FPRA models to support self-approval of risk-informed change evaluation 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 may also 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 may 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 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.

4.0 INFORMATION AND MATERIAL NECESSARY FOR THE AUDIT

The NRC audit team will require access to licensee personnel knowledgeable regarding the technical aspects of the ANO-1 NFPA 805 LAR. 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 LAR, including peer review history and resolution of peer review significant findings;
- Calculation models and supporting documentation for fire models used in support of the LAR;
- 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 risk-informed 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; and
- Other documents, which the licensee deems as necessary to support the NRC staff's audit team, outlined under audit activities.

5.0 TEAM ASSIGNMENTS AND SCHEDULE

The audit will be conducted by NRC staff from the Office of Nuclear Reactor Regulation (NRR), Division of Risk Assessment; Fire Protection Branch and the PRA Licensing Branch staff knowledgeable in PRA, safe shutdown and circuit analysis, and fire protection engineering, will comprise the audit team. Contractors from the Pacific Northwest National Laboratory and the Center for Nuclear Waste Regulatory Analysis Southwest Research Institute 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 Program Managers and various Regional Inspectors.

The NRC Audit Team Leader will be Leslie Fields and the NRC Technical Leads will be Harry Barrett (Fire Protection) and Jonathan Evans (PRA). 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 their assigned areas for review during the audit.

Audit Milestones and Schedule		
Activity	Time Frame	Comments
RAI Clarification Call	04/13/15 or later	Teleconference to provide clarification of draft RAIs.
Onsite Audit Kick-Off Meeting	04/20/15	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	04/21/15	Tours of risk significant power block areas. Second day of tours will be requested if needed.
End of Day Summary Briefing	04/20/2015 – 04/22/2015	Meet with licensee to provide a summary of any significant findings and requests for additional assistance.
Provide Break-out Areas	04/20/2015 – 04/23/2015	Facilitate discussion between site and staff technical areas.

Audit Milestones and Schedule		
Activity	Time Frame	Comments
Onsite Audit Exit Meeting	04/23/2015	NRC staff will hold a brief exit meeting, with licensee staff to conclude audit activities.
Audit Summary (see Section 8.0 of this audit plan)	90 days after exit	To document the audit.

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	H. Barrett	Team
III.2	Fundamental FPP and design elements	B. Metzger	F. DePeralta
III.3.1.2	Multiple spurious operation	N. Hall	F. DePeralta
III.3.2	Engineering evaluations, previous approval	Team	Team
III.3.2.2	Operations guidance for fire modeling PB method	B. Metzger	M. Janssens
III.3.2.2	Recovery actions	Team	Team
III.3.3	Non-power operation	N. Hall	F. DePeralta
III.5.3-5.6	Risk assessments	J. Evans	G. Coles
III.5.1	PRA technical adequacy	J. Evans	G. Coles
III.5.2	Defense in depth and safety margins	Team	Team
III.6	Monitoring program	H. Barrett	Team
III.7.1-7.3	Documentation, configuration control, quality	H. Barrett	Team
	Plant walk-down coordinator	L. Fields	As needed

6.0 LOGISTICS

This regulatory audit is planned for the week of April 20 - 23, 2015, and will last approximately 4 days. The NRC staff will schedule a conference call 1-2 weeks prior to discuss the details of the Generic 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 a.m. and an exit meeting will be held the final audit day at 12:00 noon or based on a mutually agreed upon time to after receipt of this audit plan. The NRC audit team leader will provide daily progress to licensee personnel on the second and third day of the audit.

The audit will take place at a location agreed upon by the licensee and NRC audit 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 fire areas in the power block, the regulatory 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 staff recommends that security paperwork and processing be handled upon arrival on the first day of the audit week.

7.0 SPECIAL REQUESTS

The regulatory 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 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 analysis and fire modeling 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 fire models, and the internal events PRA and FPRA.
- Access to licensee personnel knowledgeable in the FPP; fire modeling; safe shutdown and circuit analysis; FPRA and internal events PRA; 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. Draft RAIs will likely be sent prior to the audit. Formal RAIs will be sent separately to the licensee from NRR's Division of Operator Licensing after the audit. The audit summary will be placed in ADAMS.

9.0 REFERENCES

1. Browning, Jeremy G, Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 Edition), Arkansas Nuclear One, Unit 1," dated January 29, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14029A438).

2. U.S. Nuclear Regulatory Commission, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 9.5.1.2. "Risk-Informed, Performance-Based Fire Protection Program," (ADAMS Accession No. ML092590527).
3. Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.48 (10 CFR 50.48), "Fire protection."
4. NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Stations," 2001 Edition, National Fire Protection Association, Quincy, MA.
5. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.205, Revision 1, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," December 2009 (ADAMS Accession No. ML092730314).
6. Nuclear Energy Institute (NEI) 04-02, Revision 2, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," April 2008 (ADAMS Accession No. ML081130188).
7. Nuclear Energy Institute (NEI) 00-01, Revision 2, "Guidance for Post-Fire Safe Shutdown Analysis," June 2009 (ADAMS Accession No. ML091770265).

If you have any questions, please contact me at (301) 415-1081 or by e-mail at Andrea.George@nrc.gov.

Sincerely,

/RA/

Andrea E. George, Project Manager
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosure:
Regulatory Audit Plan

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***memo dated**

OFFICE	NRR/DORL/LPL4-1/PM	NRR/DORL/LPL4-1/LA	NRR/DRA/APLA/BC
NAME	AGeorge	JBurkhardt	HHamzehee*
DATE	3/27/15	3/27/15	3/19/15
OFFICE	NRR/DRA/AFP/BC	NRR/DORL/LPL4-1/BC	NRR/DORL/LPL4-1/PM
NAME	AKlein*	MMarkley	AGeorge
DATE	3/19/15	3/27/15	3/27/15

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