



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

July 20, 2016

Mr. Brian D. Boles
Site Vice President
FirstEnergy Nuclear Operating Company
Mail Stop A-DB-3080
5501 North State, Route 2
Oak Harbor, OH 43449-9760

SUBJECT: FIRSTENERGY NUCLEAR OPERATING COMPANY, DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 - REGULATORY 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) (CAC NO. MF7190)

Dear Mr. Boles:

By application dated December 16, 2015 (L-15-355) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15350A314), FirstEnergy Nuclear Operating Company (FENOC, the licensee) submitted a license amendment request for Davis-Besse Nuclear Power Station (DBNPS), Unit No. 1. The proposed amendment would adopt a fire protection program that complies with National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition" (NFPA 805), as an alternative to compliance with existing fire protection program requirements, as incorporated into Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.48(c).

To support the review of the proposed license amendment, an audit team consisting of U.S. Nuclear Regulatory Commission (NRC) staff from the Office of Nuclear Reactor Regulation (NRR), Division of Risk Assessment (DRA), will be conducting a regulatory audit of the DBNPS, Unit No. 1 fire protection program. DRA staff from the Fire Protection Branch, the Probabilistic Risk Assessment Licensing Branch, and NRC contractors from the Pacific Northwest National Laboratory and the Center for Nuclear Waste Regulatory Analysis, Southwest Research Institute will perform the regulatory audit. NRC regional staff may also be present as observers.

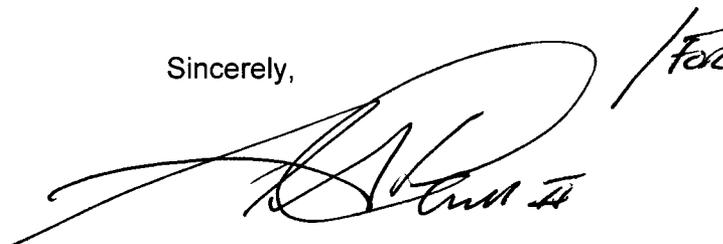
The regulatory audit is scheduled to take place onsite at DBNPS. The audit will commence with an entrance meeting between NRC and FENOC audit team members, starting Monday, September 12, 2016 (9 a.m.), concluding Thursday, September 15, 2016 (12:00 noon or a mutually agreed upon time), following an exit meeting. The NRC audit team will require access to FENOC staff knowledgeable regarding the technical aspects of the DBNPS NFPA 805 LAR. Additionally, please provide the NRC staff with a hardcopy and electronic copy of the documentation, as specified in Section 4.0, of the enclosure.

B. Boles

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If you have any questions regarding this matter, please contact me at 301-415-1380 or Blake.Purnell@nrc.gov

Sincerely,

A handwritten signature in black ink, appearing to read 'Blake Purnell', with a large, stylized flourish extending to the left. To the right of the signature, there is a handwritten mark that looks like 'For'.

Blake Purnell, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No.: 50-346

Enclosure:
Audit Plan

cc w/enclosure: Distribution via Listserv

FIRSTENERGY NUCLEAR OPERATING COMPANY,
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 REGULATORY 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) (CAC NO. MF7190)

1.0 BACKGROUND

FirstEnergy Nuclear Operating Company (FENOC, the licensee) has submitted a license amendment request (LAR) (Reference 1) to change the Davis-Besse Nuclear Power Station (DBNPS) 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 U. S. Nuclear Regulatory Commission (NRC) staff's review of the LAR has commenced in accordance with the Office of Nuclear Reactor Regulation's (NRR) Office Instruction LIC-101, "License Amendment Review Procedures." The staff has determined that a regulatory audit of the DBNPS, Unit No. 1, should be conducted in accordance with the NRR Office Instruction LIC-111, "Regulatory Audits," for staff 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. An 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 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 better understanding of the detailed calculations, analyses and bases underlying the NFPA 805 and confirm the staff's understanding of the LAR;

Enclosure

- Identify further information that is necessary for the licensee to submit for the 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 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 (SRP), Section 9.5.1.2, "Risk-Informed, Performance-Based, Fire Protection [Program]" (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 NRC 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 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 fire PRA (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 risk-informed (RI) 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 that 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 (QA) 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 QA program, and sample fire model/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.

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 DBNPS 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 FMs 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 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, engineering equivalency, and RA evaluations; and,
- Other documents, which the licensee deems as necessary to support the NRC audit team, outlined under audit activities.

5.0 TEAM ASSIGNMENTS

The audit will be conducted by NRC staff from the Office of Nuclear Reactor Regulation (NRR), Division of Risk Assessment, Fire Protection Branch, and PRA Licensing Branch staff knowledgeable in PRA, safe shutdown, 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 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 Ms. Leslie Fields and Technical Leads will be Mr. Harry Barrett (FP) and Mr. Todd Hilsmeier (PRA). The 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
RAIs Clarification Call	8/20/16 or later	Teleconference to provide clarification of draft RAIs.
Onsite Audit Kick-Off Meeting	09/12/2016	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	09/13/2016	Tours of risk significant power block areas. Second day of tours will be requested if needed.
End of Day Summary Briefing	09/12/2016 – 09/14/2016	Meet with licensee to provide a summary of any significant findings and requests for additional assistance.
Provide Break-out Areas	09/12/2016 – 09/15/2016	Facilitate discussion between site and staff technical areas.
Onsite Audit Exit Meeting	09/15/2016	NRC staff will hold a brief exit meeting, with licensee staff to conclude audit activities.

Audit Summary (see Section 8.0, below)	90 days after exit	To document the audit.
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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	H. Barrett	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	H. Barrett	F. DePeralta
III.5.3-5.6	Risk assessments	T. Hilsmeier	G. Coles
III.5.1	PRA technical adequacy	T. Hilsmeier	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 audit is planned for the week of September 12-15, 2016, and will last approximately four days. The NRC will schedule a conference call with the licensee one to two weeks prior to the audit 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 NRC. An entrance meeting will be held on the first day at 9:00 a.m. and an exit meeting on the final audit day at 12:00 noon or based on a mutually agreed upon time. The NRC team leader will provide daily progress to licensee personnel on the second and third day.

The audit will take place at an onsite location agreed upon by the licensee and NRC 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 team. The NRC requests 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 support:

- Visitor access/badging 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. The main NRC conference room should be set up for 15-18 NRC staff and contractors. An additional conference room to accommodate up to 20 people for PRA technical discussions, and two rooms should be arranged for up to 10 people for fire protection evaluations/safe shutdown analysis (SSA) and FM technical discussions.
- Access to the FPP documentation, including but not limited to: plant drawings depicting fire area boundaries, the Fire Hazards Analysis, SSA, FMs, and the internal events PRA and FPRA.
- Access to licensee personnel knowledgeable in the FPP, FM; SSA, 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 summary will be issued within 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 Agencywide Documents Access and Management System (ADAMS).

9.0 REFERENCES

1. Letter from Brian D. Boles, FirstEnergy Nuclear Operating Plant, Davis-Besse Nuclear Power Station, Unit 1, to U.S. Nuclear Regulatory Commission, "Transition to 10 CFR 50.48(c) – NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 Edition)," December 15, 2015 (ADAMS) Accession Nos. ML15350A314)
2. U.S. 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).
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.
5. 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, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Revision 2, April /2008 (ADAMS Accession No. ML081130188)
7. Nuclear Energy Institute, NEI 00-01, "Guidance for Post-Fire Safe Shutdown Analysis," Rev. 2, May/2009 (ADAMS Accession No. ML091770265)

B. Boles

- 2 -

If you have any questions regarding this matter, please contact me at 301-415-1380 or Blake.Purnell@nrc.gov

Sincerely,

/RA RHaskell for/

Blake Purnell, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No.: 50-346

Enclosure:
Audit Plan

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