

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2
REGULATORY AUDIT IN SUPPORT OF THE LICENSE AMENDMENT REQUEST TO
IMPLEMENT THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805,
"PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION FOR LIGHT WATER
REACTOR ELECTRIC GENERATING PLANTS," AS INCORPORATED INTO TITLE 10 OF
THE CODE OF FEDERAL REGULATIONS, PARAGRAPH 50.48(c) "FIRE PROTECTION"
DOCKET NOS 50-315 AND 50-316

I. BACKGROUND

The Donald C. Cook Nuclear Plant, Units 1 and 2, (D.C. Cook) has submitted a license amendment request (LAR) (Reference 1 and 2) to change its fire protection program (FPP) to one based on the National Fire Protection Association (NFPA) standard NFPA 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), "Fire Protection."

The 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 Amendments." The NRC staff has determined that a regulatory audit of D.C. Cook should be conducted in accordance with LIC-111, "Regulatory Audits," for the 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. A regulatory audit is conducted with the intent to gain an 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 licensee 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 and/or 10 CFR 54.37 that, 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 staff's understanding of the LAR;
- Identify further information that is necessary for the licensee to submit for the staff to reach a licensing or regulatory decision; this will result in requests for additional information (RAIs);

ENCLOSURE

- 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 processes and/or procedures that the licensee committed to as part of NFPA 805 implementation.

II. REGULATORY AUDIT BASIS

The basis of this audit is the licensee's LAR (Reference 1 and 2) and the Standard Review Plan (SRP) Section 9.5.1.2, "Risk-Informed, Performance-Based (RI/PB) Fire Protection" (Reference 3). References 4 through 8 provide additional information that will be used to support the audit.

III. REGULATORY AUDIT SCOPE OR METHOD

The staff 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 staff 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 staff will review, as necessary, the regulatory basis, references, licensing actions, and existing engineering equivalency evaluations, and issues which 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 audit may also include alternatives to compliance with NFPA 805 if any are identified.

The staff 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 and are maintained.

The staff 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 fire PRA model as well as the Internal Events PRA model. The review will include, as necessary, the licensee's processes that have or will be implemented to maintain the quality of the PRA 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 will also include, as appropriate, selected plant modifications to confirm they have been appropriately characterized in the LAR. The staff 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 will review program documentation, configuration control, and the FPP quality assurance program. The FPP design basis document will be reviewed, as well as other documentation of fire hazards identification and nuclear safety capability assessments. The review will include configuration control of the FPP design basis document, the fire PRA methods and model, and other relevant documentation as necessary. The staff may also review the FPP quality assurance program, and sample fire models and fire model calculations. Walkdowns may be performed as necessary to confirm features of the licensee's FPP and design elements.

IV. INFORMATION AND OTHER MATERIAL NECESSARY FOR THE REGULATORY AUDIT

The NRC audit team will require access to licensee personnel knowledgeable regarding the technical aspects of the D.C Cook LAR. At a minimum, a hardcopy and electronic copy of the following documentation should be available to the audit team:

- Calculational models and supporting documentation for PRA models used in support of the LAR, including peer review history and resolution of peer review significant findings;
- Calculational 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; and,

- Other documents, which the licensee deems as necessary to support the NRC staff's audit, outlined under audit activities.
- Calculations and evaluations used to transition to NFPA 805 such as plant change evaluations, engineering equivalency evaluations, and recovery action evaluations.

V. TEAM ASSIGNMENTS

The audit will be conducted by NRC staff from the Office of Nuclear Reactor Regulation (NRR) and contractors; Pacific Northwest National Laboratory (PNNL) and the Center for Nuclear Waste and Regulatory Analysis (CNWRA). Division of Risk Assessment (DRA) Fire Protection Branch (AFPB) and the PRA Licensing Branch (APLA) staff, and contractor personnel knowledgeable in PRA, safe shutdown and circuits analysis, and fire protection engineering, will comprise the audit team. 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 Managers and various Regional Inspectors.

The NRC team lead for this audit will be Paul W. Lain, NRR/DRA/AFPB, with support from Steve Short, Pacific Northwest National Laboratory. 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 Relative to First Audit Day Onsite (T=0)		
Activity	Time Frame	Comments
Onsite Audit Kick-Off Meeting	11/7/11	Request Licensee provide an NFPA 805 LAR overview presentation with important site specific information.
Onsite Escorted Tour	11/8/11	Tour of risk significant power block areas.
End of Day Summary Meeting	11/8-10/11	Meet with licensee to provide a summary of any significant issues and requests for additional assistance.
Provide Break-out Areas	11/8-10/11	Facilitate discussion between site and staff technical areas.
Onsite Audit Exit Meeting	11/11/11	Reviewers at licensee location for five days.
Audit Summary (see VIII)	12/12/11	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	Harry Barrett	Karl Bohlander, PNNL
III.2	Fundamental FPP and Design Elements	Naeem Iqbal	Bob Layton, PNNL
III.3.1.2	Multiple spurious operation	Harry Barrett	Karl Bohlander, PNNL
III.3.2	Fire area compliance	Team	Team
III.3.2	Engineering evaluations, EEEEs, previous approval	Iqbal/Barrett	Janssens/Huczec, CNWRA Layton/Bohlander, PNNL
III.3.2.2	Operations guidance for fire modeling PB method	Harry Barrett	Karl Bohlander, PNNL
III.3.2.2	Recovery Actions	Mike Snodderly	Garill Coles, PNNL
III.3.3	Non-power operation	Harry Barrett	Karl Bohlander, PNNL
III.5.3-5.6	Risk assessments	Mike Snodderly	Garill Coles, PNNL
III.5.1	PRA technical adequacy	Steve Dinsmore	Garill Coles, PNNL
III.5.2	DID and safety margins	Harry Barrett	Layton/Bohlander, PNNL
III.6	Monitoring program	Harry Barrett	Team

Regulatory Audit Team and Assignments			
SRP 9.5.1.2 Section	Audit Plan Review Areas	Lead	Support
III.7.1-7.3	Documentation, Configuration Control, Quality	Naeem Iqbal	Pat Mackin, CNWRA Steve Short, PNNL
	Plant walk-downs	As needed	As needed

VI. LOGISTICS

This regulatory audit is planned to take place during the week of November 7, 2011, and last approximately 5 days. This date is subject to change based on mutual agreement between the licensee and the NRC. An entrance meeting for this audit will be held on-site, the first day at 1:30 p.m. and an exit meeting will be held the final audit day at 9:30 a.m. to provide preliminary feedback to the licensee. The NRC audit leader will provide a daily progress update to licensee personnel on the second, third, and fourth day of the audit.

The audit will take place at the D.C. Cook site, Bridgman, MI and the Licensees' Engineering Building in Buchanan, MI 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, the regulatory audit must be conducted in a location that supports escorted access to the plant protected area.

VII. SPECIAL REQUESTS

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

- Escorted access to fire areas within the protected area.
- Two or more computers with internet access.
- Private conference room(s) to support document review, and audit team meetings.
- Access to the FPP documentation, including the Fire Risks Evaluations, Safe Shutdown Analysis, and the fire and internal events PRA.
- Access to licensee personnel knowledgeable in the FPP, fire modeling, safe shutdown and circuit analysis, fire and internal events PRA, non-power operations, radiological release analysis, and the NFPA 805 fire protection design-basis document.

VIII. DELIVERABLES

A regulatory audit summary will be issued within approximately 30 days of the completion of the audit. The summary will use the guidance of NRR Office Instruction LIC-111 for content. Since this audit will likely result in formal requests for additional information from the licensee regarding the LAR, the summary itself is expected to be an internal memorandum from the audit team leader to the responsible supervisor. The audit summary will be placed in ADAMS.

IX. REFERENCES

1. Letter from M. H. Carlson, Indiana Michigan Power Company, to U.S. Nuclear Regulatory Commission, "Request for License Amendment to Adopt National Fire Protection Association 805 Performance-Based Standard for Light Water Reactor Generating Plants (2001 Edition)," July 1, 2011 (ADAMS Accession Number ML11188A145).
2. Letter from J.P. Gebbie, Indiana Michigan Power Company, to U.S. Nuclear Regulatory Commission, "Supplement to Request for License Amendment to Adopt National Fire Protection Association 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 Edition)," September 2, 2011 (ADAMS Accession Number ML11256A030).
3. 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).
4. Title 10 Code of Federal Regulations, Part 50, Section 48 (10 CFR 50.48), "Fire Protection."
5. NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.
6. Regulatory Guide 1.205, Rev. 1, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," December 2009 (ADAMS accession no. ML092730314)
7. 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)
8. Nuclear Energy Institute, NEI 00-01, Guidance for Post-Fire Safe Shutdown Analysis, Rev. 2, May 2009 (ADAMS accession no. ML091770265)