



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

December 4, 2014

Mr. George H. Gellrich, Vice President  
Calvert Cliffs Nuclear Power Plant, LLC  
Calvert Cliffs Nuclear Power Plant  
1650 Calvert Cliffs Parkway  
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 –  
REGULATORY AUDIT PLAN REGARDING THE NATIONAL FIRE  
PROTECTION ASSOCIATION STANDARD 805 TRANSITION LICENSE  
AMENDMENT REQUEST (TAC NOS. MF2993 AND MF2994)

Dear Mr. Gellrich:

By letter dated September 24, 2013, Calvert Cliffs Nuclear Power Plant, LLC, the licensee, submitted a license amendment for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (Calvert Cliffs) submitted a license amendment request (LAR) to transition its fire protection licensing basis from Title 10 of the *Code of Federal Regulations* (CFR) Section 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 Nuclear Regulatory Commission (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.

The audit will be performed at the Calvert Cliffs training facility during the week of December 8, 2014. A copy of the related audit plan is enclosed.

G. Gellrich

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If you have any questions regarding this matter, please contact me at (301) 415-1016.

Sincerely,

A handwritten signature in black ink, appearing to be 'Nadiyah S. Morgan', with a long horizontal flourish extending to the right.

Nadiyah S. Morgan, Project Manager  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosure:  
As stated

cc w/encl: Distribution via Listserv

REGULATORY AUDIT PLAN

REGARDING THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805

LICENSE AMENDMENT REQUEST

CALVERT CLIFFS NUCLEAR POWER PLANT, LLC

EXELON GENERATION COMPANY, LLC

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

By letter dated September 24, 2013 (Agencywide Documents and Management System (ADAMS) Accession Nos. ML13301A673 and ML13301A674) Calvert Cliffs Nuclear Power Plant, LLC, the licensee, submitted a license amendment for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (Calvert Cliffs) submitted a license amendment request (LAR) to transition its fire protection licensing basis from Title 10 of the *Code of Federal Regulations* (CFR) Section 50.48(b) to 10 CFR 50.48(c), National Fire Protection Association Standard (NFPA) 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.

The Nuclear Regulatory Commission (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 (NRR) 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 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 recordkeeping requirements" which although not required to be submitted as part of the licensing action, would help the NRC staff better understand the licensee's provided information.

Enclosure

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;
- Identify further information that is necessary for the licensee to submit for the NRC staff to reach a licensing or regulatory decision;
- 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 for conducting the audit is in support of the NRC staff's review of the licensee's LAR and to comply with NUREG-0800 Standard Review Plan (SRP) Section 9.5.1.2, "Risk-Informed, Performance-Based Fire Protection" (RI/PB FPP) (ADAMS Accession No. ML092590527). 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 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 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 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 OTHER INFORMATION AND MATERIAL NEEDED

The NRC audit team will require access to licensee personnel knowledgeable regarding the technical aspects of the Calvert Cliffs 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, outlined under audit activities.

#### 5.0 TEAM ASSIGNMENTS

The audit will be conducted by NRC staff from the Office of NRR, Division of Risk Assessment (DRA); Fire Protection Branch (AFPB), and the PRA Licensing Branch (APLA) 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 may be utilized to augment 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 Harold Barrett (FP) and Todd Hilsmeier (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	12/01/2014 or later	Teleconference to provide clarification of draft RAIs.
Onsite Audit Kick-Off Meeting	12/08/2014	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	12/09/2014	Tours of risk significant power block areas. Second day of tours will be requested if needed.
End of Day Summary Briefing	12/09/2014 - 12/11/2014	Meet with licensee to provide a summary of any significant findings and requests for additional assistance.
Provide Break-out Areas	12/08/2014-12/11/2014	Facilitate discussion between site and staff technical areas.
Onsite Audit Exit Meeting	12/11/2014	NRC staff will hold a brief exit meeting, with licensee staff to conclude audit activities.
Audit Summary (see 8.0)	01/30/2015	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	J. Robinson* (via conference call)	Team
III.2	Fundamental FPP and Design Elements	C. Moulton	F. DePeralta
III.3.1.2	Multiple spurious operation	B. Litkett	F. DePeralta
III.3.2	Engineering evaluations, previous approval	Team	Team
III.3.2.2	Operations guidance for fire modeling PB method	C. Moulton	J. Huczek
III.3.2.2	Recovery Actions	Team	Team
III.3.3	Non-power operation	B. Litkett	F. DePeralta
III.5.3-5.6	Risk assessments	T. Hilsmeier	W. Ivans
III.5.1	PRA technical adequacy	T. Hilsmeier	W. Ivans
III.5.2	Defense in depth and safety margins	Team	Team
III.6	Monitoring program	J. Robinson*(via conference call)	Team
III.7.1-7.3	Documentation, Configuration Control, Quality	J. Robinson*(via conference call)	Team
	Plant walk-down Coordinator	L. Fields	As needed

## 6.0 LOGISTICS

This regulatory audit will be performed during the week of December 8, 2014, and will last approximately four days. The NRC staff will schedule a conference call one to two weeks prior 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 4:00 PM or a mutually agreed upon time to conclude the audit activities. 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 facility's protected area for escorted access. Visitor access is requested for the entire audit team. We recommend 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 will be needed for all team members participating in the plant tour.
- Two printers and two computers with internet access, access to the site portal, and printing capability. 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 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 FPE/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, 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 30 days of the completion of the audit. The summary content will be based on the guidance of NRR Office Instruction LIC-111.

Draft RAIs will be sent to the licensee prior to the audit. The formal RAIs will be issued after the audit. The audit summary will be placed in ADAMS.

## 9.0 REFERENCES

1. Gellrich, George, Calvert Cliffs Nuclear Power Plant, LLC letter to Document Control Desk, U.S. Nuclear Regulatory Commission, "License Amendment Request re: Transition to 10 CFR 50.48(c) – NFPA 805 Performance-Based Standard for Fire Protection," September 24, 2013 (Agencywide Documents and Management System (ADAMS) Accession Nos. ML13301A673 and ML13301A674).
2. U.S. Nuclear Regulatory Commission, "Standard Review Plan - Risk-Informed, Performance-Based Fire Protection Program," NUREG-0800, Section 9.5.1.2, December 2009, ADAMS Accession No. ML092590527.
3. *U.S. Code of Federal Regulations*, "Domestic Licensing of Production and Utilization Facilities - Fire protection." Part 50, Chapter 1, Title 10, "Energy," Section 50.48.
4. NFPA-805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, National Fire Protection Association, Quincy, MA.
5. U.S. Nuclear Regulatory Commission, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," Regulatory Guide 1.205, Rev. 1, December 2009, ADAMS Accession No. ML092730314.
6. Nuclear Energy Institute, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," NEI 04-02, Revision 2, April 15, 2008, ADAMS Accession No. ML081130188.
7. Nuclear Energy Institute, "Guidance for Post-Fire Safe Shutdown Analysis," NEI 00-01, Rev. 2, June 5, 2009, ADAMS Accession No. ML091770265.

G. Gellrich

- 2 -

If you have any questions regarding this matter, please contact me at (301) 415-1016.

Sincerely,

*/RA/*

Nadiyah S. Morgan, Project Manager  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

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J. Robinson

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\*See dated memo

OFFICE	LPLI-1/PM	LPLI-1/LA	LPLI-1/PM	DRA/AFBP	DRA/ALPA	LPLI-1/BC
NAME	ACHereskin	KGGoldstein	NMorgan	AKlein*	HHamzehee*	BBeasley (NMorgan for)
DATE	10/04/2014	12/04/2014	12/04/2014	11/05/2014	11/05/2014	12/04/2014

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