

December 10, 2008

MEMORANDUM TO: Mark Cunningham, Director  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

FROM: Sunil Weerakkody, Deputy Director */RA/*  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

SUBJECT: TEMPLATE TO SUPPORT REGULATORY AUDITS DURING THE  
REVIEW OF LICENSE AMENDMENT REQUESTS 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”

The purpose of this memorandum is to provide a template for use by Division of Risk Assessment (DRA) staff when preparing regulatory audit plans to support the staff review of license amendment requests (LARs) to implement the National Fire Protection Association (NFPA) standard NFPA 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* (10 CFR), 50.48(c) “Fire Protection.”

The regulatory audit plan template follows the recommended format in the Office of Nuclear Reactor Regulation (NRR) office instruction OVRST-103 “Regulatory Audits” (ML082900195). The template includes a number of potential areas of focus for a regulatory audit of an NFPA 805 LAR. The review areas for a specific licensee should be tailored by the NRC staff based on issues raised during review of the LAR.

The intent is that the template be used to create a plant-specific plan for conducting a regulatory audit, as necessary, during the review of a LAR to implement NFPA 805. The resulting audit plan would be transmitted to the licensee by the NRC project manager as an attachment to a letter.

Enclosure: As stated

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OFFICE	NRR/DRA/AFP	NRR/DRA	NRR/DRA/AFP	NRR/DRA/APLA
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DATE	12/02/08	11/24/08	12/04/08	12/09/08
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NAME	MVaaler	TBoyce	SWeerakkody	
DATE	12/09/08	12/10/08	12/10/08	

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{plant name}

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 number(s)}

## I. BACKGROUND

*This section provides a brief introduction of the licensee and application associated with or reason for the regulatory audit.*

The {plant name} plant has submitted a license amendment request (LAR) to change its fire protection program 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,” as incorporated into Title 10 of the *Code of Federal Regulations* (10 CFR), Paragraph 50.48(c), “Fire Protection.”

The Nuclear Regulatory Commission (NRC) staff review of the LAR proceeds in accordance with Office of Nuclear Reactor Regulation (NRR) office instruction LIC-101, “License Amendments.” If deemed appropriate for a given review, a regulatory audit of the licensee may be conducted in accordance with OVRST-103, “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 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 may 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 licensee 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);

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

## II. REGULATORY AUDIT BASIS

*This section identifies the documents upon which the regulatory audit is based. This may include, but is not limited to: sections of the licensing action request, NRC regulations, applicable sections of the standard review plan (SRP), and/or regulatory guides.*

The basis of this audit is the Standard Review Plan (SRP) Section 9.5.1b, “Risk-Informed, Performance-Based (Rl/PB) Fire Protection” (reference 2), and the LAR (reference 1). References 3 through 7 provide additional information that will be used to support the audit.

## III. REGULATORY AUDIT SCOPE OR METHOD

*This section identifies the areas of focus for the regulatory audit (e.g., process information, calculations) or describes the method in which the regulatory audit will be conducted.*

The scope of this audit will be the licensee’s proposed transition to NFPA 805, including planned and completed modifications to achieve compliance with that standard, risk assessments of any non-compliant plant configurations going forward, and the process the licensee proposes to use for self-approval of future fire protection changes. Any calculation, evaluation, risk assessment, procedure, or other document related to the licensee’s LAR may be reviewed at the discretion of the Audit Leader.

The reviewers will focus the audit on the areas shown in the list below. {The list below should be tailored to the specific regulatory audit being conducted. Additional focus areas may be added if necessary to support the Nuclear Regulatory Commission (NRC) staff’s review.}

### 1. Fundamental Fire Protection Program Elements and Minimum Design Requirements

- a. Confirm key features of the licensee’s fundamental FPP and design elements as required by Chapter 3 of NFPA 805. [SRP III.2]
- b. Perform the following reviews on attributes required by Chapter 3 of NFPA 805 as necessary.
  - i. Verify the accuracy of a sample of performance-based Fire Protection engineering evaluations, which the licensee has performed to demonstrate compliance to the Fundamental Fire Protection Program and Design Elements.
  - ii. Review the regulatory basis, reference documents, licensing actions, and existing engineering equivalency evaluations (EEEs).

- iii. Review a sample of EEEEs, which the licensee did not submit for staff review, to ensure that the EEEEs are acceptable for the NFPA 805 licensing basis.
- iv. Review a sample of issues which the licensee has deemed “previously approved” to ensure that appropriate documents exist in support of the licensee’s conclusions.

## 2. Nuclear Safety Performance Criteria

- a. Non-Power Operational Modes: Review a sample of the licensee’s procedures and calculations related to fires during non-power operations. Verify that the licensee’s processes enable the licensee to demonstrate that the nuclear safety performance criteria are met during Higher Risk Evolutions. [SRP III.3.3]
- b. Operational Guidance: Review a sample of the operational guidance required by Section 4.2.4.1.6 of NFPA 805: Review a sample of the licensee’s procedures to provide guidance to plant personnel that details the credited success path(s) for each fire area, including the performance of recovery actions and repairs. [SRP III.3.2.2]
- c. Compliance by Fire Area: Perform the following reviews on one or more fire areas.
  - i. Review the licensee’s evaluation of compliance to NFPA 805 paragraph 4.2.3 deterministic requirements, performance-based methods as allowed under NFPA 805 paragraph 4.2.4, or RI/PB alternatives to compliance with NFPA 805 pursuant to 10 CFR 50.48(c)(4). [SRP III.3.2]
  - ii. Review the process used by the licensee to address multiple spurious operations (MSOs). [SRP III.3.1.3]
  - iii. Review the transition of operator manual actions (OMAs) to recovery actions. [SRP III.3.2.2]
  - iv. Verify the accuracy of a sample of Fire Protection engineering evaluations, which the licensee has performed to demonstrate compliance to the deterministic requirements of NFPA 805 Section 4.2.3.
  - v. Review the regulatory basis, performance goal summary, reference documents, licensing actions, and EEEEs. [SRP III.3.2]
  - vi. Review a sample of EEEEs, which the licensee did not submit for staff review, to ensure that the EEEEs are acceptable for the NFPA 805 licensing basis. [SRP III.3.2]
  - vii. Review a sample of issues which the licensee has deemed “previously approved” to ensure that appropriate documents exist in support of the licensee’s conclusions. [SRP III.3.2]

## 3. Risk Assessments and Plant Change Evaluations

- a. Self-Approval of Certain FPP Changes: Review the licensee’s process for self-approving FPP changes post-transition and determine whether the licensee has adequate processes in place to ensure that acceptable probabilistic risk analysis (PRA)

model quality is maintained and that defense-in-depth and safety margins are appropriately addressed after transition. [SRP III.1.1.2]

- b. Risk Assessments and Plant Change Evaluations:
  - i. Review a sample of the licensee's risk assessments related to NFPA 805. [SRP III.5]
  - ii. Explore any apparent issues with the technical adequacy of the licensee's fire PRA by reviewing a sample of fire PRA calculations, analysis procedures, PRA peer review documentation, system notebooks, or similar information. Review a sample of the processes established by the licensee to maintain the quality of its PRA and Fire Modeling calculations after the licensee receives the NFPA 805 license. As necessary, review a sample of the licensee's resolutions of the findings from the peer review of its Fire PRA. [SRP III.5.1]
  - iii. For one or more fire areas, review sample risk assessments and plant change evaluations. The staff will verify that the applicant has provided a risk summary, including identifying fire hazards, reporting core damage frequency (CDF) and large-early release frequency (LERF) values, identifying the significant core damage sequences and initiating events, and providing other information in accordance with Regulatory Guide 1.174 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis". [SRP III.3.2]
- c. Defense-in-Depth and Safety Margins: Review selected plant change evaluations and fire risk evaluations to ensure that the philosophy of defense-in-depth and adequate safety margins are maintained relative to fire protection and nuclear safety. [SRP III.5.2]
- d. FPP Changes without Prior NRC Approval: Review the licensee's process for modifying its RI/PB FPP after implementation of NFPA 805. [SRP III.5.7]
- e. Monitoring Program: Review a sample of the licensee's procedures to verify that the licensee has established a monitoring program to ensure that the availability and reliability of the fire protection systems and features are maintained and to assess performance of the fire protection program in meeting the performance criteria. [SRP III.6]

#### 4. Other Audit Topics

- a. Modifications: Review selected plant modifications that the licensee has identified as necessary to implement the RI/PB FPP to confirm they have been appropriately characterized in the analyses submitted in the LAR. Review the process for controlling compensatory measures to confirm their adequacy while they remain in effect until the modification is completed. [SRP III.1.1.1]
- b. Documentation, Configuration Control, Quality:
  - i. Review a sample of the document the licensee created to document fire hazards identification and nuclear safety capability assessment, on a fire area basis, for all fire areas that could affect the nuclear safety or radioactive release performance criteria defined in NFPA 805 Chapter 1, and verify its adequacy. [SRP III.7.1]

- ii. Review the licensee's process for controlling the FPP design basis document. Verify that the configuration management process addresses changes affecting the design, operation, or maintenance of the plant so that they are reviewed to determine if these changes impact the fire protection program documentation. [SRP III.7.2]
  - iii. Review the licensee's FPP quality program. Review a sample of the licensee's calculations to verify that they have been subjected to an independent review. [SRP III.7.3]
  - iv. Review a sample of the licensee's fire modeling calculations to ensure that the licensee has used fire models acceptable to the NRC, and that the conclusions drawn based on fire models have considered the limitations of the models.
- c. Perform walkdowns as necessary to confirm features of the licensee's FPP and design elements.

#### IV. INFORMATION AND OTHER MATERIAL NECESSARY FOR THE REGULATORY AUDIT

*This section identifies known information or material needed by the audit member(s) to complete the regulatory audit. This could include, but not be limited to, licensee's reports, calculations, and computer codes.*

The NRC audit team will require access to personnel knowledgeable regarding the technical aspects of the {plant name} LAR. 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;
- Documentation of changes made to (or planned for) PRA models in support of change analysis;
- 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.

## V. TEAM ASSIGNMENTS

*This section identifies the audit members and their respective area(s) of responsibility.*

The audit will be conducted by NRC staff from the Office of Nuclear Reactor Regulation (NRR) Division of Risk Assessment (DRA). Staff from the Fire Protection Branch (AFPB) and the PRA Licensing Branch (APLA), along with contractor personnel knowledgeable in PRA and Fire Protection, will comprise the audit team. NRC staff members from other organizations may be assigned to the team as appropriate. Other NRC staff members or contractors may participate as observers.

The team lead for this regulatory audit is {name}. The table below shows the planned audit team composition and their assigned areas for review during the audit {fill out table}.

Audit Team and Assignments		
Name	Org.	Assignment

## VI. LOGISTICS

*This section documents the date and location(s) for the regulatory audit; entrance and exit briefing dates and times; and audit schedule.*

This regulatory audit is planned to take place the week of {date} and last {insert duration} 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 early the first day. An exit meeting will be held early the final day of the audit to provide preliminary feedback to the licensee. The NRC audit leader should provide a brief, daily update of the progress of the audit to licensee personnel on the second, third and fourth days of the regulatory audit.

The audit will take place at the {plant name} site or other location agreed upon by the licensee and NRC staff where (1) the necessary reference material and (2) appropriate analysts will be available to support the review. If 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.



The key milestones for this audit and the relative time period for each are shown in the table:

Audit Milestones and Schedule Relative to First Regulatory Audit Day Onsite		
Activity	Time Frame*	Comments
Reviewer planning meeting	T-6	Finalize audit plan and reviewer assignments
Letter to licensee	T-4	Discuss audit and the documentation and support that will be required during the audit
Audit team kick-off meeting	T-2	Set forth expectations; discuss plan; finalize logistics
Pre-audit review	from T-4 to T-1	Reviewers should familiarize themselves with the content of the LAR and draft RAIs.  Reviewers should also draft the SERs.
Onsite audit	per schedule	Reviewers at licensee location for 5 days.
Draft RAIs or SE input	T+2	To support safety evaluation or second round of RAIs if needed
Regulatory audit summary (see VIII)	T+90 days	
* Time in weeks (unless noted), relative to 1 <sup>st</sup> day the team is onsite.		

## VII. SPECIAL REQUESTS

*This section may document any requests of the licensee by the team to support the audit.*

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

- Escorted access to fire areas within the protected area.
- One or more computers with internet access.
- Private conference room to support document review, audit team meetings.
- Access to the fire protection program documentation, including the Fire Hazards Analysis, Safe Shutdown Analysis and Fire PRA.
- Access to licensee personnel knowledgeable in the fire protection program, safe shutdown analysis, fire PRA and the NFPA 805 fire protection design basis document.
- Other items as required by the NRC staff.

## VIII. DELIVERABLES

*This section identifies the deliverables for the regulatory audit and establishes the schedule for the deliverables. At a minimum, a schedule for issuance of the regulatory audit summary and Requests for Additional Information (RAIs) should be provided.*

A regulatory audit summary should be issued within 90 days of the completion of the audit. Depending on scope of the audit, the regulatory audit summary may be documented as a letter to the licensee, a detailed summary report, or an internal memorandum to the responsible supervisor or projects. In all cases, the audit summary should be placed in ADAMS. The regulatory audit summary should provide a clear, succinct summary of the audit activities, and, as applicable should:

- Identify the audit location and dates,
- List the audit team members,
- List licensee staff that participated in substantive discussions,
- List documents that were audited,
- Describe the audit activities,
- Describe the closing or exit briefing,
- Identify RAI(s) or potential RAI(s) that were discussed or that will be issued based on the audit,
- Describe open item(s) and the proposed closure path(s), and
- Describe deviations from the audit plan.

## IX. REFERENCES

*This section identifies references that may be applicable to the regulatory audit.*

1. {insert reference to the LAR here}
2. {insert reference to SRP 9.5.1b (draft) when issued}
3. Title 10 Code of Federal Regulations, Part 50, Section 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, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," May 2006.
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 1, September 2005.
7. Nuclear Energy Institute, NEI 00-01, Guidance for Post-Fire Safe Shutdown Analysis, Rev 1, November 2004.