



U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

9.5.1.2 RISK-INFORMED, PERFORMANCE-BASED FIRE PROTECTION PROGRAM

REVIEW RESPONSIBILITIES

Primary – Organization responsible for the review of fire protection.

Secondary – Organization responsible for the review of risk-informed (RI) licensing actions

I. AREAS OF REVIEW

This chapter of the Standard Review Plan (SRP) provides guidance for the U.S. Nuclear Regulatory Commission (NRC) staff who reviews RI, Performance-Based (PB) Fire Protection Program (FPP) license amendment requests (LARs) submitted pursuant to 10 CFR 50.48(c) and the guidance in Regulatory Guide (RG) 1.205 “Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants.” This guidance is applicable to existing operating reactor licensees under Title 10 of the *Code of Federal Regulations*, Part 50 (10 CFR Part 50) and covers the review of LARs for transition and post-transition to an RI/PB FPP based on National Fire Protection Association (NFPA) Standard 805. Also, the staff previously issued an update to SRP Section 9.5.1 in March, 2007; for the benefit of Combined License (COL) applicants under 10 CFR part 52. SRP Section 9.5.1 focused on deterministic

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USNRC STANDARD REVIEW PLAN

This Standard Review Plan (SRP), NUREG-0800, has been prepared to establish criteria that the U.S. Nuclear Regulatory Commission staff responsible for the review of applications to construct and operate nuclear power plants intends to use in evaluating whether an applicant/licensee meets the NRC’s regulations. The Standard Review Plan is not a substitute for the NRC’s regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide an acceptable method of complying with the NRC regulations.

The standard review plan sections are numbered in accordance with corresponding sections in Regulatory Guide 1.70, “Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition).” Not all sections of Regulatory Guide 1.70 have a corresponding review plan section. The SRP sections applicable to a combined license application for a new light-water reactor (LWR) are based on Regulatory Guide 1.206, “Combined License Applications for Nuclear Power Plants (LWR Edition).”

These documents are made available to the public as part of the NRC’s policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-0800 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments may be submitted electronically by email to NRR_SRP@nrc.gov.

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FPPs and advised that the primary review guidance document for NFPA 805 plants would be developed in the future. SRP Section 9.5.1.2 provides this guidance. Note that only the review of RI/PB FPP LARs is covered by this SRP section. For example, exemptions from Appendix R to 10 CFR Part 50 requirements or deviations from NUREG-0800 Chapter 9.5.1 license commitments are not covered in this SRP section.

In developing this SRP section, the staff considered requirements of 10 CFR 50.48(c) and NFPA 805 to the extent it is incorporated into 10 CFR 50.48(c). The staff also considered the guidance provided by RG 1.205 which endorses with exceptions Nuclear Energy Institute (NEI) NEI 04-02, "Guidance for Implementing a Risk-Informed Performance-Based Fire Protection Program Under 10 CFR 50.48(c)" revision endorsed in RG 1.205. At the time of drafting this SRP section, some of the documents referenced herein are subject to revision, like RG 1.205 and NEI 04-02. For example, the referenced documents may be reorganized, which would affect the specific section references in this SRP section. A reviewer should use the most current revision of RG 1.205 for accurate references. In addition, the staff incorporated staff positions developed using experience from NFPA 805 implementation. The staff has documented these additional staff positions via the NFPA 805 Frequently Asked Questions (FAQ) Process. [RIS 2007-19]

Review Areas

A FPP for a nuclear power plant (NPP) licensed to operate generally consists of the following elements: [RG 1.189]

- Delineation of organization, staffing, and responsibilities
- Performance of a fire hazards analysis sufficient to ensure safe shutdown functions and minimize radioactive material releases in the event of a fire
- Limitation of damage to structures, systems and components (SSCs) important to safety so that the capability to safely shut down the reactor is ensured
- Evaluation of fire test reports and fire data to ensure they are appropriate and adequate for ensuring compliance with regulatory requirements
- Evaluation of compensatory measures for interim use for adequacy and appropriate length of use
- Training and qualification of fire protection personnel appropriate for their level of responsibility
- Quality assurance
- Control of FPP changes

The staff reviews the overall RI/PB FPP described in the LAR with respect to the acceptance criteria in this SRP and the Acceptance Review Matrix attached to this SRP section (Attachment 1). Specifically, the staff reviews the following, as applicable:

1. Orders and license conditions that the licensee has identified as needing to be revised or superseded

2. Revised technical specifications (TSSs), including Administrative Controls and Limiting Conditions for Operation and their bases
3. Proposed Updated Final Safety Analysis Report (UFSAR) changes related to the FPP if provided
4. Plant modifications and other changes that the licensee has identified as necessary to implement the RI/PB FPP, including the schedule for implementation and justification of the schedule
5. Process for self-approving RI/PB FPP changes post-transition, including the types of RI/PB changes that the licensee intends to self approve, the capability of the Fire Probabilistic Risk Assessment (PRA) to model those changes, and the method used to establish a cause-effect relationship to estimate the change in risk associated with the performance based alternative
6. Statements on no significant hazards consideration and environmental considerations
7. Licensee's request per 10 CFR 50.48(c)(2)(vii) to subject the fundamental FPP and design elements of Chapter 3 of NFPA 805 to the PB methods permitted elsewhere in the standard
8. Licensee's request per 10 CFR 50.48(c)(4) to use RI/PB alternatives to compliance with NFPA 805 including details of the proposed alternatives
9. Licensee's description of operational guidance provided to plant personnel detailing the success path(s) for each fire area and the performance of recovery actions (RAs)
10. Engineering analyses required by NFPA 805 Section 2.4, "Fire Modeling, Nuclear Safety Capability Assessment, and Fire Risk Evaluations"
11. Any FAQs cited by the licensee. For FAQs that have not been closed by the NRC, the licensee's detailed description and justification for their use in the submittal
12. Plant structures that comprise the power block as defined in NFPA 805
13. Verification that feed-and-bleed is not relied on as the only path to post-fire safe shutdown in pressurized-water reactors (PWRs) for safe shutdown
14. Pre- and post-transition regulatory basis for each fire area, including methods used to accomplish NFPA 805 performance criteria, disposition of deviations/exemptions, existing engineering equivalency evaluations (EEEs), and any associated risk assessment results
15. Fire protection during non-power operational modes to ensure that nuclear safety performance criteria are met
16. Results of the Nuclear Safety Capability Assessment for Radioactive Release to ensure that the radioactive release goals and performance criteria have been met

17. Basis for the technical adequacy of the fire PRA model, or model parts, being used to perform change evaluations and the process for assuring the PRA model is maintained and updated to reflect the as-built, as-operated and maintained plant, and operating experience of the plant as needed to support any proposed self approval process
18. Methods used to estimate the change in risk for each type of performance based approach, a sample of the calculations as appropriate, and verify that the change in risk is within the acceptance guidelines, including resultant risk increase/decrease, and how defense-in-depth (DID) and safety margins are maintained for each change
19. Monitoring program, including bases for failure probability assumptions used in the fire PRA, methods used to monitor availability, reliability, and performance of FPP systems, and processes for identifying and implementing corrective actions
20. FPP documentation, including the FPP design basis document and supporting documents, and the Licensee's configuration control process for the FPP and associated analyses
21. Process for assuring quality for each FPP analysis, calculation, and evaluation
22. Fire-induced multiple spurious operations (MSOs), including the process used to identify and screen MSOs and how each is evaluated in the fire PRA
23. Operator manual actions (OMAs) transitioning to RAs, including documentation for those that have been previously approved by the NRC and that those RAs that are credited with achieving the nuclear safety performance criteria are feasible and reliable
24. Change in risk associated with relying on RAs instead of NFPA 805 requirements
25. Process for resolving issues with electrical raceway fire barrier systems (e.g., Hemyc and/or MT)

Review Interfaces

Other SRP Sections interface with this Section as follows:

SRP Section 19.1, "Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities."

SRP Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance."

SRP Section 9.5.1, "Fire Protection Program."

II. ACCEPTANCE CRITERIA

Section II lists the governing regulations applicable to the areas of review in this SRP Section and the primary guidance documents that provide acceptable methods for meeting the regulatory requirements.

Requirements

The licensee's FPP will generally be considered acceptable if it meets the applicable criteria established in the following:

1. General Design Criterion (GDC) 3, "Fire protection," in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, which establishes the general criteria for fire and explosion protection of SSCs important to safety
2. 10 CFR 50.48(a), which requires that each operating NPP have a fire protection plan that meets the requirements of GDC 3
3. 10 CFR 50.48(c), which incorporates NFPA 805 (2001 Edition) by reference, with certain exceptions. This regulation establishes the requirements for using NFPA 805 as an alternative to the requirements associated with 10 CFR 50.48(b) and Appendix R to 10 CFR Part 50 or the specific plant license condition.
4. NFPA 805 (2001 Edition), which documents the consensus standard for RI/PB fire protection of existing NPPs, to the extent incorporated by reference by 10 CFR 50.48(c)
5. 10 CFR Part 20, "Standards for Protection Against Radiation," which establishes the radiation protection limits used as NFPA 805 performance criteria, as specified in Section 1.5.2 of NFPA 805

SRP Acceptance Criteria

Specific SRP criteria acceptable to meet the relevant requirements of the NRC's Regulations identified above are as follows for the review described in this SRP section. The SRP is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations.

The following documents provide acceptable methods, guidance, and other criteria applicable to meeting the Commission's FPP requirements:

1. NUREG-1600, "General Statement of Policy and Procedure for NRC Enforcement Actions, Interim Enforcement Policy, May 1, 2000," which provides the Commission's policy on enforcement discretion for non-compliant conditions, either existing or identified during transition to an RI/PB FPP in accordance with 10 CFR 50.48(c)

2. RG 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," which provides NRC guidance on an acceptable approach to meeting 10 CFR 50.48(c), including endorsement (with exceptions) of NEI 04-02, "Guidance for Implementing a Risk-Informed Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," and portions of NEI 00-01, "Guidance for Post-Fire Safe Shutdown Circuit Analysis"
3. RG 1.174, Revision 1, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," which provides NRC guidance on an acceptable method to assess the nature and impact on licensing basis changes using risk information within the context of applicability under 10 CFR 50.48(c) and RG 1.205
4. RG 1.189, Revision 2, "Fire Protection for Nuclear Power Plants," which provides general guidance on acceptable FPPs
5. Section 19.1 of the SRP, "Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," which provides review guidance on determining the technical adequacy of PRA models for RI initiatives
6. Section 19.2 of the SRP, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," which provides guidance on reviewing risk information used to support plant-specific changes to the licensing basis
7. RG 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk Informed Activities," issue date to be determined (TBD), which provides guidance with respect to acceptable methods and PRA quality
8. NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," Volumes 1 and 2, issued September 2005, which provides a method for developing a fire PRA in support of adopting an RI/PB FPP, within the context of the additional clarification provide by the staff via the NFPA 805 FAQ process.
9. NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," which provides qualitative methods to demonstrate that OMAs are feasible and reliable
10. NUREG-1824, "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications," Volumes 1–7, issued May 2007, which provides guidance on (V&V) of fire models

III. REVIEW PROCEDURE

Licensees of existing plants that wish to adopt an RI/PB FPP that complies with NFPA 805 must submit a LAR in accordance with 10 CFR 50.48(c)(3)(i). Licensees that wish to adopt 10 CFR 50.48(c) but wish to use PB methods permitted elsewhere in NFPA 805 for the Chapter 3,

“Fundamental Fire Protection Program and Design Elements,” of NFPA 805 may do so by submitting an LAR in accordance with 10 CFR 50.48(c)(2)(vii). Licensees that wish to use RI/PB alternatives to compliance with NFPA 805 must submit an LAR in accordance with 10 CFR 50.48(c)(4). In addition to the LARs required by the rule, licensees may submit additional elements of their program for which they wish to receive specific NRC review and approval as set forth in RG 1.205, “Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants,” Regulatory Position 2.2.

The review of an LAR starts with an acceptance review by the NRC staff in accordance with Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-109, “Acceptance Review Procedures.” Attachment 1 of this SRP includes an acceptance review matrix as an aid in performing the acceptance review of the LAR. Once an LAR is accepted as sufficient for the staff to begin its review, the staff review proceeds in accordance with LIC-101, “License Amendments.” If deemed appropriate for a given review, a regulatory audit of the licensee may 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.

The NRC staff reviewing LARs to implement an RI/PB FPP should be aware of the NFPA 805 FAQ Process. The NRC established the FAQ process as described in RIS 2007-19, “Process for Communicating Clarifications of Staff Positions Provided in Regulatory Guide 1.205 Concerning Issues Identified during the Pilot Application of National Fire Protection Association Standard 805,” to clarify issues encountered during the pilot transition. The FAQ process provides a means for the staff to establish and communicate interim positions on technical and regulatory issues that emerge as experience is gained in the review of these LARs. Approved interim positions documented through the FAQ process should be used where applicable in reviewing those portions of an LAR to which they apply. These positions will be formalized in future revisions of RG 1.205 and reflected in this SRP.

III.1 PROGRAMMATIC REVIEW OF LICENSE AMENDMENT REQUEST

The required content of an LAR for transition to an RI/PB FPP is defined in 10 CFR 50.48(c)(3)(i), 10 CFR 50.90 and, as applicable, 10 CFR 50.48(c)(2)(vii) and 10 CFR 50.48(c)(4). Regulatory Position 2.2 of RG 1.205 and Section 4.6.1 of NEI 04-02, provide additional guidance on the content of the LAR. 10 CFR 50.48(c)(3)(ii) requires the licensee to perform the required analyses and revise the fire protection plan prior to changing either the plant or the FPP.

Section 2.2 of NFPA 805 provides the general approach for establishing the fire protection requirements for a NPP. Section 3.3 of NEI 04-02 provides additional detail on implementing this approach. The NRC staff will review the LAR to verify that each step in the process has been satisfactorily completed.

III.1.1 Orders, License Condition, and Technical Specifications

The NRC staff will confirm that the licensee has identified any orders and license conditions that must be revised or superseded, and provided any necessary revisions to the plant's technical specifications and the bases thereof to implement a FPP that complies with NFPA 805. The

reviewer should ensure that the LAR includes a discussion of the changes to the UFSAR necessitated by the license amendment. [NEI 04-02 paragraph 4.6.1]

The staff will verify that the LAR provides updated TSs. The staff will verify that the package includes the following (as identified by the licensee):

- Changed, added or revoked Administrative Controls
- Revised or superseded Limiting Conditions for Operation, ensuring that they are consistent with 10 CFR 50.48(c) and 10 CFR 50.36
- Revised associated Bases as required by 10 CFR 50.48(c)(3)(i)

The reviewer must keep in mind that there will likely be other requirements that must be met with regard to remote shutdown capability to meet GDC 19 of 10CFR 50, Appendix A, "Control Room." The reviewer will confirm that the licensee does not inadvertently delete the TSs associated with remote shutdown requirements required by other regulations related to the ability to safely shut down from outside the control room.

III.1.2 Modifications

The staff will ensure that the license condition lists any plant modifications that the licensee has identified as necessary to implement the RI/PB FPP and includes a description of the modification, a schedule for implementation of the modification, and a commitment to maintain in effect compensatory measures until the modification is completed.

III.1.3 Self-Approval of Certain FPP Changes

After a licensee implements NFPA 805, it may implement changes to its FPP in accordance with the license condition approved by the NRC staff. A plant change evaluation as described in paragraph III.5.3 of this SRP is required for any change to a previously approved FPP element.

A change may be any of the following: [RG 1.205 regulatory position 3.2.1]

- (a) A physical plant modification that affects the FPP;
- (b) A programmatic change (e.g., change to a procedure, assumption or analysis) that affects the FPP; or,
- (c) An in situ condition (physical or programmatic) that is an FPP regulatory noncompliance or a fire protection licensing-basis noncompliance, which the licensee does not intend to correct via a plant or programmatic modification.

The NRC staff will review the licensee's process for self-approving changes and determine whether the licensee has adequate processes in place to ensure that acceptable PRA technical adequacy is maintained, and that DID and safety margins are appropriately addressed after transition.

The staff will ensure that the license condition identifies whether the licensee is permitted to make certain changes to the FPP without prior NRC review and approval, and, if so, the risk acceptance criteria and any restrictions in terms of the types of changes that may be so implemented. Note that Section 3.2.4 of RG 1.205 lists FPP changes that always require prior NRC approval.

RG 1.205 Regulatory Position 3.1 contains a sample license condition that allows for self-approval of FPP changes. The staff will verify that the license condition contains sufficient detail to ensure self-approval meets these regulatory positions.

Note: Licensees may reference methods in NRC approved topical reports (TR). This option affords efficiencies both for licensees and NRC. A licensee must still request approval to adopt the alternative approved in the TR by applying for a license amendment which demonstrates the licensee has met the criteria in the TR for such adoption. [NEI 04-02 paragraph 2.4.2]

III.1.4 Significant Hazards Consideration

The staff will verify that the LAR includes a statement concerning the “no significant hazards consideration,” in accordance with 10 CFR 50.91 and 10 CFR 50.92. Appendix H to NEI 04-02 provides one example of an acceptable statement.

III.1.5 Environmental Consideration (Categorical Exclusion Finding)

The staff will verify that the LAR includes a statement on environmental considerations in accordance with 10 CFR 51.22(b) and (c). Appendix H to NEI 04-02 provides one example of an acceptable statement.

III.1.6 Transition Implementation Schedule

The staff will verify that the LAR includes an “updated transition schedule” per Section 4.6.1 of NEI 04-02. The submittal will provide a transition schedule, justification for the schedule, and a list of modifications with a commitment to maintain in effect associated compensatory measures. The staff will ensure that the proposed schedule is reasonable.

III.1.7 Performance-Based Methods for NFPA 805 Chapter 3 Elements

Notwithstanding the prohibition in Section 3.1 of NFPA-805, a licensee can request NRC approval under 10 CFR 50.48(c)(2)(vii), via a license amendment, to apply PB methods permitted elsewhere in the standard (i.e. NFPA 805 4.2.4) to the fundamental FPP and design elements of Chapter 3 of NFPA 805. Where a licensee proposes to use PB methods to demonstrate compliance with the fundamental FPP and design elements in Chapter 3 of NFPA 805, the NRC staff will review the LAR in accordance with 10 CFR 50.48(c)(2)(vii) and RG 1.205, Regulatory Position 3.2.3, to verify the adequacy of the methods and the licensee’s evaluation and conclusions.

III.1.8 Risk-Informed, Performance-Based Alternatives to Compliance with NFPA 805

NFPA 805 provides one framework describing how PB, RI methods may be used to self-approve plant changes that affect the FPP program. Other frameworks may be acceptable.

Under 10 CFR 50.48(c)(4), a licensee may request NRC approval to use RI or PB alternatives (i.e., different from those prescribed by NFPA 805) to demonstrate compliance with 10 CFR 50.48(c) using the LAR process. In those instances, the NRC staff will review the LAR in accordance with 10 CFR 50.48(c)(4) to verify that all of the following are true for the proposed alternative and its application:

- (a) It satisfies the performance goals, objectives, and criteria specified in NFPA 805 related to nuclear safety and radiological release;
- (b) It maintains safety margins; and,
- (c) It maintains fire protection DID (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe-shutdown capability).

Regulatory Position 3.2.3 of RG 1.205 provides additional guidance regarding the information to be supplied by the licensee when requesting NRC staff approval for alternative RI/PB methods; the licensee should provide:

- (a) A detailed description of the alternative RI/PB method
- (b) A description of how the method will be applied, the aspects of the FPP to which it will be applied, and the circumstances under which it will be applied
- (c) The acceptance criteria, including risk increase acceptance criteria, that the licensee will apply when determining whether the results of an evaluation that uses this methodology meet the required NFPA 805 performance goals, performance objectives, and performance criteria
- (d) For risk assessments using PRA methods, a justification of the technical adequacy of the PRA model per RG 1.200 for evaluation of the changes to which it will be applied
- (e) For risk assessments using PRA methods, a description of the peer review and how the review findings have been addressed.

The NRC staff's review of LARs submitted in accordance with 10 CFR 50.48(c)(4) will focus on the technical aspects of the approach or method proposed as an alternative to compliance with NFPA 805. The approach or method shall meet an equivalent level of protection to that established by NFPA 805. The staff will review a sample of the calculations to verify that the licensee's evaluation and conclusions with regard to meeting the safety margin and DID criteria are acceptable. Proposed alternatives are subjected to the same evaluation criteria (e.g., V&V) as the endorsed methods. The reviewer will also evaluate the LAR to verify that the licensee adequately performed and documented these evaluations.

III.2 FUNDAMENTAL FIRE PROTECTION PROGRAM ELEMENTS AND MINIMUM DESIGN REQUIREMENTS

Chapter 3 of NFPA 805 establishes the fundamental FPP and design elements. The NRC staff will review the LAR to verify that the licensee complies with the fundamental FPP and design elements required by Chapter 3 of NFPA 805.

The staff will review the LAR to evaluate the applicant's overall approach to determining how its FPP complies with the requirements of NFPA 805 Chapter 3 requirements. The approach in NEI 04-02 as endorsed in RG 1.205 is one approach acceptable to the NRC.

Chapter 3 of NFPA 805 notes that alternatives to the fundamental FPP attributes of Chapter 3, which were previously approved by the NRC, take precedence over the requirements in Chapter 3. If the licensee references previous NRC approvals of exemption or deviation requests, the NRC staff will review the documentation demonstrating prior NRC approval. The documentation should contain justification that the exemption or deviation is still valid. [RG 1.205 regulatory position 2.4]

III.2.1 Water Supply and Distribution

10 CFR 50.48(c)(2)(vi) modifies NFPA 805 paragraph 3.6.4 by not endorsing the italicized exception; i.e., a "provisional" manual fire fighting standpipe/hose station system may not be used in place of seismically qualified standpipes and hose stations unless previously approved in the licensing basis. Licensees who wish to use the italicized exception in Section 3.6.4 of NFPA 805 must submit a request for a license amendment in accordance with 10 CFR 50.48(c)(2)(vii). However, because the NRC considers seismically qualified standpipes and hose stations to be of such importance, the NRC reviewer must ensure that the three criteria in 10 CFR 50.48(c)(2)(vii) are satisfied.

Note that Appendix A to Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," dated February 24, 1977, makes separate provisions for operating plants and plants with construction permits issued before July 1, 1976, and does not require seismically qualified standpipes and hose stations for those plants. Therefore, the requirement in Section 3.6.4 of NFPA 805 is not applicable to licensees with non-seismic standpipes and hose stations previously approved in accordance with Appendix A to BTP APCS 9.5-1.

III.2.2 Definition of Power Block

The staff will review the LAR to determine which plant structures are identified as comprising the "power block." The reviewer should verify that the licensee's list of power block structures conforms to the definition of "power block" in the glossary of NFPA 805, which defines power block as "structures that have equipment required for nuclear plant operations."

III.2.3 Electrical Raceway Fire Barrier Systems (e.g. Hemyc and MT)

On April 10, 2006, the NRC issued Generic Letter 2006-03, "Potentially Non-Conforming Hemyc and MT Fire Barrier Configurations," requiring licensees to provide information regarding the use of electrical raceway fire barriers, particularly Hemyc and MT, at their plants. If the applicant has not resolved the electrical raceway fire barrier issue prior to submittal of their RI/PB FPP LAR, the applicant must address the issue in the LAR. The staff will verify that the applicant has adequately addressed this issue, including having provided a justification for the use of any compensatory measures and proposed plant modifications.

III.3 NUCLEAR SAFETY PERFORMANCE CRITERIA

Chapter 2 of NFPA 805 provides the methodology to be used in implementing a PB FPP. NEI 04-02 Section 4.3.2 sets out a systematic process for evaluating the existing post-fire safe shutdown analysis against the methodology requirements provided in Chapter 2 of NFPA 805. RG 1.205 endorses the deterministic post-fire safe shutdown analysis methodology provided in Chapter 3 of NEI 00-01.

III.3.1 Transition and Implementation

10 CFR 50.48(c)(3)(ii) states that Chapter 2 analyses shall be completed and the fire protection program plan modified before changing the FPP and the plan as permitted by NFPA-805.

The staff will ensure that the licensee has adequately performed the engineering analyses required by NFPA 805, Section 2.4 including fire modeling, nuclear safety capability assessment and fire risk evaluations.

The staff will ensure that the licensee completed a systematic approach to transition the FPP to the new requirements in NFPA 805. As endorsed in RG 1.205, Section B-2 of Appendix B to NEI 04-02 describes one acceptable approach to documenting the comparison of an existing FPP with the requirements of NFPA 805 and industry guidance document NEI 00-01.

In evaluating nuclear safety performance criteria transition, staff will reference Section 1.5 of NFPA 805, which establishes the nuclear safety performance criteria, and Chapter 4 of NFPA 805, which provides the methodology to determine the fire protection systems and features required to achieve the performance criteria outlined in Section 1.5.

The staff will review the LAR to determine whether the nuclear safety performance criteria have been met consistent with the requirements in NFPA 805. The staff will ensure licensee compliance with the following requirements:

III.3.1.1 *Feed-and-Bleed*

10 CFR 50.48(c)(2)(iii) specifically notes that use of feed-and-bleed as the sole fire-protected safe-shutdown path for maintaining reactor coolant inventory, pressure control, and decay heat removal capability is not permitted for pressurized water reactors. The staff will determine if the LAR includes a statement to this effect as well as a description of any dependence on feed-and-bleed in the FPP.

III.3.1.2 *Existing Cables*

NFPA 805 paragraph 3.3.5.3 states that electrical cables shall meet a flame propagation test that is acceptable to the authority having jurisdiction. 10 CFR 50.48(c)(2)(v), which does not endorse the italicized exception in NFPA 805 paragraph 3.3.5.3, allows a flame retardant coating on the cables or an automatic fixed suppression system to provide an equivalent level of protection.

The NRC staff will review the LAR to verify that the requirements for existing cables are met. If the NRC staff approves use of these alternatives, this approval should be explicitly documented in the staff's safety evaluation report.

Note that the flame spread testing requirements in IEEE 383, "IEEE Standard for Type Test of Class 1E Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations," are now provided in IEEE 1202, "IEEE Standard for Flame-Propagation Testing of Wire and Cable," and have been removed from the current version of IEEE 383. Most existing plants reference earlier versions of IEEE 383 and have approved FPPs based on this standard. Plants that reference IEEE 383 are not required to meet IEEE 1202 when transitioning to a RI/PB FPP.

III.3.1.3 *Fire-Induced Multiple Spurious Operations*

Section 2.4.2.2 of NFPA 805 requires the applicant to evaluate fire-induced failure modes resulting from spurious operations and signals, including multiples, as a part of their safe shutdown circuit analysis. The description of the MSO analysis should contain sufficient information concerning methods, tools, and acceptance criteria used to enable the staff to determine the acceptability of the licensee's methodology. The analysis should generally be performed and arranged by fire area, although in some cases an alternative spatial approach may prove to be more practical. If an expert panel process was used, it should be documented with results clearly presented. The NRC staff will verify that the applicant has evaluated MSOs in conformance with Regulatory Position 3.3 of RG 1.205.

III.3.2 Specific Compliance with NFPA 805 by Fire Area

The staff will review the LAR to ensure that each fire area has been evaluated and determined to comply with the requirements of NFPA 805. The staff will verify that each fire area either meets NFPA 805 paragraph 4.2.3 deterministic requirements; meets the NFPA 805 paragraph 1.5 performance criteria as demonstrated using PB methods as allowed under NFPA 805 paragraph 4.2.4; or meets the NFPA 805 paragraph 1.5 performance criteria as demonstrated using RI or PB alternatives to compliance with NFPA 805 pursuant to 10 CFR 50.48(c)(4). Refer to paragraph III.1.8 of this SRP Section for further information on alternatives.

III.3.2.1 *Deterministic Compliance with NFPA 805 Section 4.2.3*

For each fire area where the licensee has selected the deterministic approach to demonstrate compliance, the staff will verify that the deterministic requirements of NFPA 805 paragraph 4.2.3 are met. Licensees may demonstrate compliance through:

- a) Compliance with the deterministic requirements of NFPA 805 through the use of previously approved exemptions/deviations from their current licensing basis; or,
- b) The use of an engineering equivalency evaluation of an existing configuration to demonstrate an equivalent level of fire protection compared to the deterministic requirements. [NFPA 805 paragraph 2.2.7]

Previously approved exemptions/deviations (normally from Appendix R requirements) describe plant configurations that the staff has determined to be acceptable, notwithstanding that

Appendix R or NFPA-805 may require some other configuration. Such plant configurations may be deemed to satisfy the deterministic requirements of NFPA-805 provided the basis for acceptability of these previously approved exemption/deviations continues to be valid. EEEEs that support deviations from the requirements and methods of NFPA 805 must be submitted for NRC approval as part of the transition to NFPA 805. [RG 1.205 regulatory position 2.3] These EEEEs include those commonly referred to as a “Generic Letter 86-10 evaluations, which were developed by the licensee without prior NRC review or approval. The staff will verify that EEEEs supporting deviations from the requirements and methods of NFPA 805 clearly demonstrate an equivalent level of fire protection compared to the deterministic requirements. Guidance for acceptable EEEEs is provided in NUREG-0800, Section 9.5.1, “Fire Protection,” and in Regulatory Guide 1.189, “Fire Protection for Operating Nuclear Power Plants.”

OMAs that are currently allowed or were previously reviewed and approved by the NRC’s Office of NRR that meet the NFPA 805 definition of an RA automatically shall imply use of the PB approach as outlined in NFPA 805 paragraph 4.2.4.

III.3.2.2 *Performance-Based Compliance with NFPA 805 Section 4.2.4*

For each fire area where the licensee has selected the PB approach, the staff will verify that the requirements of NFPA 805 paragraph 4.2.4 are met. A PB approach is necessary if the deterministic requirements of NFPA 805 are not satisfied.

The NRC staff will verify that the change in risk is appropriately defined, the magnitude is acceptable (Section III.5.5 of this SRP), and DID and sufficient safety margins are maintained (Section III.5.2 of this SRP).

If the fire modeling PB approach is employed, the NRC staff will verify that the requirements of NFPA 805 paragraph 4.2.4.1 are met. The staff will verify that the licensee has made a statement in the LAR confirming that it has provided the operational guidance required by NFPA 805 paragraph 4.2.4.1.6, and that all RAs are feasible. NUREG-1852 is one acceptable PB approach that can be used in judging the feasibility and reliability of RAs.

If the fire risk evaluation PB approach is employed, the NRC staff will review the integrated assessment of the acceptability of risk, DID, and safety margins per Section III.5.5 of this SRP. The staff will review OMA that the licensee desires to transition to RAs. If the licensee has chosen to use the PB approach because the licensee credits RAs, the NRC staff will review the licensee’s evaluation of the additional risk per Section III.5.4 of this SRP.

III.3.2.3 *Risk-Informed or Performance-Based Alternatives to Compliance with NFPA 805*

For each fire area where the licensee has selected RI or PB alternatives to compliance with NFPA 805, the staff will verify that the appropriate requirements are met. Refer to paragraph III.1.8 of this SRP section for information relating to these alternatives.

III.3.3 Non-Power Operational Modes

The staff will review the licensee's treatment of fires during non-power operations (NPOs).

RG 1.205 endorses the approach documented in NEI 04-02. Section 4.3.3 of NEI 04-02 states: "The nuclear safety goal of NFPA 805 requires evaluation of the effects of a fire during any operational modes and plant configurations." Section 4.3.3 of NEI 04-02 goes on to provide a strategy that "...demonstrate[s] that the nuclear safety performance criteria are met for High(er) Risk Evolutions (HREs) (HREs as defined by Nuclear Management and Resources Council (NUMARC) 91-06) during non-power operational modes ..."

The staff will review the LAR to verify that the licensee has demonstrated that the nuclear safety performance criteria are met during HREs. One way to accomplish this objective is for the NRC staff to verify that the licensee has adequately documented the completion of the tasks in Appendix F to NEI 04-02.

NUMARC 91-06 discusses the development of outage plans and schedules. A key element of that process is to ensure SSCs that provide key safety functions (KSFs) perform as needed during the various outage evolutions. The results of the fire area analysis of those components relied upon to maintain DID should be factored into the plant's existing outage planning process. In addition, for KSF equipment removed from service during the HREs, the impact should be evaluated based on KSF equipment status and the NPOs fire area assessment to develop needed contingency plans/actions. The NRC staff should review the licensee's process for ensuring the nuclear safety performance criteria are met during HREs.

III.4 RADIOACTIVE RELEASE PERFORMANCE CRITERIA

NFPA 805 includes radioactive release goals, performance objectives, and performance criteria in paragraphs 1.3.2, 1.4.2, and 1.5.2. The staff will verify that the LAR documents that radiation release to any unrestricted area due to the direct effects of fire protection activities (but not involving fuel damage) remains as low as reasonable achievable, not to exceed the limits in 10 CFR Part 20. Appendix G to NEI 04-02 provides items for the reviewer to consider as part of this review.

III.5 RISK ASSESSMENTS AND PLANT CHANGE EVALUATIONS

NFPA 805 requires risk assessments to be performed in several instances:

1. Plant Change Evaluations [NFPA 805 Section 2.4.4]
2. Additional risk associated with RAs [NFPA 805 Section 4.2.4]
3. Fire Risk Evaluations [NFPA 805 Section 4.2.4.2]

NRC staff review guidance for the risk assessments (1, 2 and 3 above) is provided in SRP paragraphs III.5.3, III.5.4, and III.5.5, respectively.

III.5.1 Fire PRA Technical Adequacy

The staff will confirm the licensee has provided an evaluation of the technical adequacy of its PRA model consistent with RG 1.200 and SRP Section 19.2. The staff will confirm that the licensee has provided a description of its processes for assuring the PRA model is maintained and updated to reflect the as-built, as-operated and maintained plant, including operating experience of the plant.

The staff will review the licensee's assessment of the technical adequacy of the PRA model used for plant change evaluations required to transition to a RI/PB FPP and for any types of changes the licensee will be allowed to self-approve after implementation of the approved RI/PB FPP. The staff will review the maintenance and update process for the PRA model using SRP Section 19.1.

III.5.2 Defense-in-Depth and Safety Margins

The staff will ensure that the licensee's plant change evaluations (Section III.5.3 of this SRP) and fire risk evaluations (Section III.5.5 of this SRP) ensure that the philosophy of DID is maintained relative to fire protection and nuclear safety. [NFPA 805 paragraph 2.4.4.2 and paragraph 4.2.4.2]

Fire protection DID is achieved when an adequate balance of each of the following elements is provided: [NFPA 805 paragraph 1.2]

- (1) Preventing fires from starting
- (2) Rapidly detecting fires and controlling and extinguishing promptly those fires that do occur, thereby limiting fire damage
- (3) Providing an adequate level of fire protection for SSCs important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed

Nuclear safety DID is achieved when an adequate balance of the following elements is provided: [SRP 19.2]

- (1) Preventing core damage
- (2) Preventing containment failure
- (3) Mitigating consequence

Consistency with the DID philosophy for fire protection and nuclear safety is maintained if the following acceptance guidelines, or their equivalent, are met:

- A reasonable balance is preserved among prevention of fires, early detection and suppression of fires, and the ability to achieve and maintain safe shut down of the plant post-fire.

- A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and mitigation of consequences.
- Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided.
- System redundancy, independence, and diversity are preserved commensurate with the expected frequency of challenges, consequences of failure of the system, and associated uncertainties.
- Defenses against potential common cause failures are preserved and the potential introduction of new common cause failure mechanisms is assessed.
- The independence of fission product barriers is not degraded.
- Defenses against human errors are preserved.
- The intent of the GDC of 10 CFR Part 50, Appendix A, is preserved.

The staff will ensure that the licensee's plant change evaluations ensure that sufficient safety margins are maintained. [NFPA 805 paragraph 2.4.4.3] With sufficient safety margins:

- Codes and standards or their alternatives approved for use by the NRC are met; and,
- Safety analysis acceptance criteria in the licensing basis are met, or proposed revisions provide sufficient margin to account for analysis and data uncertainty.

Note that the deterministic approach in NFPA 805 for meeting the performance criteria shall be deemed to satisfy the DID and safety margins requirements. [NFPA 805 paragraphs 2.4.4.2 and 2.4.4.3]

III.5.3 Plant Change Evaluations

Changes to a previously approved FPP element shall be evaluated with a plant change evaluation. NFPA 805 Section 2.4.4 states:

“A plant change evaluation shall be performed to ensure that a change to a previously approved fire protection program element is acceptable. The evaluation process shall consist of an integrated assessment of the acceptability of risk, defense-in-depth, and safety margins. The impact of the proposed change shall be monitored.”

As applicable, plant change evaluations are required for transition to NFPA 805 as well as after implementation of the NFPA 805 FPP.

If required to address the acceptance guidance of RG 1.174 and SRP Section 19.2 (i.e., if any individual change or the overall change results in a risk increase above 1.0E-6/yr CDF, or 1.0E-7 large early release frequency (LERF)/yr), the staff will confirm the licensee has provided the total CDF and LERF, i.e., risk contributions from internal and external events, including internal fires, to allow comparison with the acceptance guidelines of RG 1.174.

The staff will review the licensee's plant change evaluations using the acceptance guidance of RG 1.174, and SRP Section 19.2. The staff should review any combined changes and cumulative risk as described in Section III.5.6 below.

III.5.3.1 *LAR to Implement NFPA 805 ("Transition")*

The staff will verify that the LAR identifies all FPP non-compliances that the licensee does not intend to bring into deterministic compliance under NFPA 805. For each individual noncompliant item, the staff will confirm the licensee has provided a plant change evaluation which includes the following:

- Change in CDF and LERF comparing the non-compliant configuration to what would constitute a fully compliant deterministic configuration
- DID evaluation
- Safety margin evaluation

In addition, the staff will confirm the licensee has provided the total change in CDF and LERF due to all non-compliances, including plant changes planned for the transition to NFPA 805. This may also include credit for risk decreases due to retaining or making changes to fire protection features not required by NFPA 805, as permitted in RG 1.205 Section 2.2.

III.5.3.2 *Plant Change Evaluations following NFPA 805 Implementation*

Once a licensee has implemented an FPP based on NFPA 805, some FPP changes will require prior NRC review and approval. The staff will review the plant change evaluation of these changes to ensure that the integrated assessment of risk, DID, and safety margins demonstrates that the change is acceptable. The staff will confirm the acceptability of the licensee's process for monitoring the impact of the change. For FPP changes that do not require NRC review and approval, the licensee will perform the plant change evaluation as approved by the NRC staff; see Section III.1.3 of this SRP.

III.5.4 Risk of Crediting Recovery Actions

NFPA 805 paragraph 4.2.4 states, in part: "When the use of recovery actions has resulted in the use of this approach, the additional risk presented by their use shall be evaluated." The staff will evaluate the licensee's definition of recovery action, how all human actions associated with mitigating fire initiated sequences have been evaluated and characterized, and the risk assessment of all RAs when used in lieu of deterministic requirements in NFPA 4.2.3. This risk evaluation may be qualitative per NFPA 805 paragraph 4.2.4.1 or quantitative per paragraph 4.2.4.2, and a bounding approach is acceptable. [RG 1.205 regulatory position 2.3]

III.5.5 Fire Risk Evaluations

NFPA 805 paragraph 4.2.4.2 states in part: "Use of fire risk evaluation for the PB approach shall consist of an integrated assessment of the acceptability of risk, DID, and safety margins."

The licensee must describe the change in risk for each, or each type, of alternative to the deterministic requirements of NFPA 805 in sufficient detail for the staff to be able to determine that the method is acceptable (a reference to a previously approved methodology would be sufficient if the licensee fully adopts such a methodology). The characterization of each change, or type of change, should include establishing a cause-effect relationship to identify portions of the PRA affected by the issue being evaluated. The results of the change in risk analyses should reflect this cause-effect relationship in a quantification of the impact on the PRA elements.

If the impacts of a change to the plant cannot be associated with elements of the PRA, the PRA should be modified accordingly or the impact of the change should be evaluated qualitatively as part of the integrated decision-making process. In any case, the effects of the changes on the reliability and unavailability of c or on operator actions should be appropriately accounted for in the risk assessment.

The staff will review the licensee's evaluation for any use of the PB approach in NFPA 805 paragraph 4.2.4.2 to ensure that the change in risk satisfies RG 1.174 acceptance guidelines and that DID and safety margins remain acceptable. The staff should review any combined changes and cumulative risk as described in Section III.5.6 below.

III.5.6 Cumulative Risk and Combined Changes

Section 2.4.4.1 of NFPA 805 requires licensees to evaluate the cumulative effect of plant changes (including all previous changes that have increased risk) on overall risk. The staff will review the licensee's evaluation of cumulative risk in accordance with the guidance in Section 3.3.2 of RG 1.174. For a transition LAR, cumulative risk is the total risk of transition. After transition to NFPA 805, the cumulative risk of further plant changes will be the change in risk between any future RI/PB changes and the fire CDF and LERF associated with the plant immediately after transition to NFPA 805. If the licensee includes a license condition permitting self approval of future changes to the FPP, the staff will verify that the proposed license condition limits the risk increase from any individual change such that there is reasonable assurance that the effect of self-approved changes on cumulative risk will be acceptable. [RG 1.205 Section 3.2.6]

Section 2.4.4.1 further states that if more than one plant change is combined into a group for the purposes of evaluating acceptable risk, the evaluation of each individual change shall be performed along with the evaluation of combined changes. Any risk increases may be combined with risk decreases when estimating the total risk change. The staff will evaluate the licensee's combined changes as Combined Change Requests (CCRs) as described in RG 1.174 and SRP Section 19.2. RG 1.205 Section 3.2.6 provides guidance for combining changes.

III.6 MONITORING PROGRAM

Section 2.6 of NFPA 805 requires licensees to establish and monitor acceptable levels of availability, reliability, and performance of fire protection systems and features. Monitoring methods are required to consider plant and industry operating experience. If the established levels of availability, reliability or performance are not met, appropriate corrective actions to return to the established levels shall be implemented.

The staff will review the licensee's proposed program to comply with these requirements.

III.7 PROGRAM DOCUMENTATION, CONFIGURATION CONTROL, AND QUALITY ASSURANCE

Section 5 of NEI 04-02 provides guidance to licensees regarding program documentation, configuration control, and quality assurance. This guidance is endorsed in RG 1.205.

III.7.1 Program Documentation

Section 2.7.1 of NFPA 805 requires the licensee to adequately document compliance with the requirements in the standard, including establishment of an FPP design basis document. The NRC staff will verify that the licensee has established an FPP design basis document that meets the requirement of NFPA 805 Section 2.7.1.2.

III.7.2 Configuration Control

Section 2.7.2 of NFPA 805 requires the licensee to maintain configuration control of the design basis and supporting documents. The design basis document shall be kept up-to-date and maintained as a controlled document. Changes affecting the design, operation, or maintenance of the plant shall be reviewed by the licensee to determine if these changes impact the FPP documentation.

The NRC staff will review the licensee's process for maintaining configuration control of the FPP design basis document.

The acceptability of licensee's process for maintaining configuration control of the fire PRA methods and model is determined per Section III.5.1 of this SRP.

III.7.3 Quality

Section 2.7.3 of NFPA 805 establishes the quality requirements for each analysis, calculation, or evaluation performed in support of the LAR. These quality requirements are in the areas of independent review, V&V, personnel qualifications, and uncertainty analyses.

The NRC staff will verify that the licensee has established an FPP quality program that meets the requirements of NFPA Section 2.7.3. The staff will verify that the licensee has justified that fire models used are acceptable to the NRC. Note that the uncertainty analysis required by NFPA 805 Section 2.7.3.5 is not required to support deterministic approach calculations per 10 CFR 50.48(c)(2)(iv).

IV. EVALUATION FINDINGS

The reviewer verifies that the applicant has provided sufficient information and that the review and calculations (if applicable) support conclusions similar to the following to be included in the staff's safety evaluation report:

The staff concludes that the proposed LAR to implement an RI/PB FPP is acceptable and that the licensee has demonstrated that the resulting FPP will meet the requirements of GDC 3, 10 CFR Parts 50.48(a) and 50.48(c). The staff has reviewed the licensee's analysis and justifications for the change and concludes that there is reasonable assurance that a fire in any plant area during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition.

The reviewer also states the bases for those conclusions.

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using this SRP Section.

The staff will use this SRP section in performing safety evaluations of licensee requests to:

- Establish and maintain a FPP that complies with NFPA 805, as allowed by 10 CFR 50.48(c)(3)(i);
- Use PB methods permitted in NFPA 805 for the FPP elements and minimum design requirements of NFPA Chapter 3, as allowed by 10 CFR 50.48(c)(2)(vii);
- Use RI or PB alternatives to compliance with NFPA 805, as allowed by 10 CFR 50.48(c)(4).

The staff will also use applicable portions of this SRP section in performing safety evaluations of licensee requests for any changes to its NFPA 805 FPP that must be submitted for prior approval.

The provisions of this SRP section apply to reviews of applications submitted six months or more after the date of issuance of this SRP section, unless superseded by a later revision.

VI. REFERENCES

1. 10 CFR Part 50, §50.12, "Specific exemptions"
2. 10 CFR Part 50, §50.34, "Contents of applications; technical information"
3. 10 CFR Part 50, §50.36, "Technical Specifications"
4. 10 CFR Part 50, §50.48, "Fire protection"
5. 10 CFR Part 50, §50.90, "Application for amendment of license or construction permit"
6. 10 CFR Part 50, §50.91, "Notice for public comment; State consultation"
7. 10 CFR Part 50, §50.92, "Issuance of amendment"

8. 10 CFR Part 50, Appendix A, General Design Criterion 3, "Fire Protection"
9. 10 CFR Part 50, Appendix A, General Design Criterion 5, "Sharing of Structures, Systems, and Components"
10. 10 CFR Part 50, Appendix A, General Design Criterion 19, "Control Room"
11. 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979"
12. Branch Technical Position (BTP) SPLB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," USNRC (Formerly BTP CMEB 9.5-1) (ADAMS Accession No. ML070660454)
13. BTP APCS 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," USNRC, May 1, 1976 (ADAMS Accession No. ML070660461)
14. BTP APCS 9.5-1, Appendix A, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976," USNRC (ADAMS Accession No. ML070660458)
15. Generic Letter 1986-10, "Implementation of Fire Protection Requirements," USNRC, April 24, 1986
16. Generic Letter 1986-10, Supplement 1, "Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used To Separate Redundant Safe-Shutdown Trains Within the Same Fire Area," USNRC, March 25, 1994
17. Generic Letter 2006-03, "Potentially Non-Conforming Hemyc and MT Fire Barrier Configurations," USNRC, April 10, 2006
18. NEI 00-01, "Guidance for Post-Fire Safe Shutdown Circuit Analysis," Revision 1, Nuclear Energy Institute, January 2005 (ADAMS Accession No. ML050310295)
19. NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Revision 1, Nuclear Energy Institute, September 2005. (ADAMS Accession No. ML052590476)
20. NEI 07-12, "Fire Probabilistic Risk Assessment (FPRA) Peer Review Guidelines," Draft Version F, Revision 0, Nuclear Energy Institute, December 2007 (ADAMS Accession No. ML073551159)
21. NFPA 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants," National Fire Protection Association
22. NUREG-1600, "General Statement of Policy and Procedure for NRC Enforcement Actions, Interim Enforcement Policy May 1, 2000," USNRC
23. NUREG-1805, "Fire Dynamics Tools (FDTs) Quantitative Fire Hazard Analysis Methods for the U.S. Nuclear Regulatory Commission Fire Protection Inspection Program," USNRC, Washington, DC, December 2004

24. NUREG-1824, "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications," Volumes 1–7, USNRC, May 2007
25. NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," USNRC, October 2007
26. NUREG/CR-6850, "EPRI/NRC-RES, Fire PRA Methodology for Nuclear Power Facilities," Volumes 1 and 2, USNRC, September 2005
27. Regulatory Guide 1.174, Revision 1, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," USNRC, November 2002¹
28. Regulatory Guide 1.189, Revision 2, "Fire Protection for Nuclear Power Plants," USNRC, issue date TBD
29. Regulatory Guide 1.200, Revision 2, "An Approach For Determining The Technical Adequacy Of Probabilistic Risk Assessment Results For Risk-Informed Activities," USNRC, issue date TBD
30. Regulatory Guide 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light Water Nuclear Power Plants," USNRC, May 2006 (ADAMS Accession No. ML061100174)
31. Regulatory Issue Summary 2004-03, Revision 1, "Risk-Informed Approach for Post-Fire Safe-Shutdown Associated Circuit Inspections," USNRC, December 29, 2004.
32. Regulatory Issue Summary 2005-07, "Compensatory Measures to Satisfy the Fire Protection Program Requirements," USNRC, April 19, 2005
33. Regulatory Issue Summary 2005-30, "Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements," USNRC, December 20, 2005
34. Regulatory Issue Summary 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," USNRC, June 30, 2006

¹All regulatory guides listed herein were published by the U.S. Nuclear Regulatory Commission. Most are available electronically through the Public Electronic Reading Room on the NRC's public Web site, at <http://www.nrc.gov/reading-rm/doc-collections/reg-guides/>. Single copies of regulatory guides may also be obtained free of charge by writing the Reproduction and Distribution Services Section, ADM, USNRC, Washington, DC 20555-0001, or by fax to (301) 415-2289, or by email to DISTRIBUTION@nrc.gov. Active guides may also be purchased from the National Technical Information Service (NTIS) on a standing order basis. Details on this service may be obtained by contacting NTIS at 5285 Port Royal Road, Springfield, Virginia 22161, online at <http://www.ntis.gov>, by telephone at (800) 553-NTIS (6847) or (703)605-6000, or by fax to (703) 605-6900. Copies are also available for inspection or copying for a fee from the NRC's Public Document Room (PDR), which is located at 11555 Rockville Pike, Rockville, Maryland; the PDR's mailing address is USNRC PDR, Washington, DC 20555-0001. The PDR can also be reached by telephone at (301) 415-4737 or (800) 397-4209, by fax at (301) 415-3548, and by email to PDR@nrc.gov.

35. Regulatory Issue Summary 2007-19, "Process for Communicating Clarifications of Staff Positions Provided in Regulatory Guide 1.205 Concerning Issues Identified during the Pilot Application of National Fire Protection Association Standard 805," USNRC, August 20, 2007
36. NRC Office of Nuclear Reactor Regulation Office Instruction LIC-101, "License Amendments," USNRC, February 9, 2004. (ADAMS Accession No. ML040060258)
37. NRC Office of Nuclear Reactor Regulation Office Instruction LIC-109, "Acceptance Review Procedures," USNRC, May 2, 2008 (ADAMS Accession No. ML081200811)
38. NRC Office of Nuclear Reactor Regulation Office Instruction LIC-111, "Regulatory Audits," USNRC, December 29, 2008 (ADAMS Accession No. ML082900195)
39. NRC Office of Nuclear Reactor Regulation Office Instruction LIC-500, "Processing Request for Reviews of Topical Reports," USNRC, June 24, 2005 (ADAMS Accession No. ML051800651)

VII. ATTACHMENTS

1. RI/PB FPP LAR Technical Acceptance Review Checklist for use with NRR Office Instruction LIC-109, "Acceptance Review Procedures"

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the Standard Review Plan are covered by the requirements of 10 CFR Part 50 and 10 CFR Part 52, and were approved by the Office of Management and Budget, approval number 3150-0011 and 3150-0151.

PUBLIC PROTECTION NOTIFICATION

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

Attachment 1 – RI/PB FPP LAR Acceptance Review Matrix

RI/PB FPP License Amendment Request Acceptance Review Matrix			
SRP III.	Required Information	Sufficient for Review?	Comments
1.1	The LAR identifies any orders and license conditions that must be revised or superseded;		
	The LAR provides any necessary revisions to the plant's technical specifications and the bases thereof to implement a FPP that complies with NFPA 805.		
	The LAR includes a discussion of the changes to the Updated Final Safety Analysis Report (UFSAR) necessitated by the license amendment.		
1.2	The LAR lists any plant modifications necessary to implement the RI/PB FPP; it includes description, a schedule, and justification, including compensatory measures until the modification is completed.		
1.3	The LAR provides process for self-approving changes post-transition; including methods to be used. Ensure the following are included in the LAR:		
	Licensee's process for self-approving changes post-transition		
	The risk acceptance criteria in both CDF and LERF and any restrictions in terms of the types of changes that may be so implemented.		
	Licensee's approach to demonstrating that the fire PRA is technically adequate for the types of changes to be self-approved		
	Licensee's PRA maintenance and update process to ensure that the PRA reflects the as-built, as-operated and maintained plant		
	The method for ensuring adequate DID and safety margins are maintained		
	Allowed self-approval of NFPA 805 chapter 3 changes (optional)		

RI/PB FPP License Amendment Request Acceptance Review Matrix

SRP III.	Required Information	Sufficient for Review?	Comments
	Revised license condition, including self-approval if sought		
1.4	The LAR includes “no significant hazards consideration”		
1.5	The LAR includes a statement on environmental considerations		
1.6	The LAR includes a transition schedule, justification for the schedule, and a list of modifications with a commitment to maintain in effect associated compensatory measures.		
1.7	The LAR includes a request to use PB methods to establish compliance with the prescriptive fundamental FPP and design elements of Chapter 3 of NFPA 805 (10 CFR 50.48(c)(2)(vii) (if applicable)		
1.8	The LAR includes a request to use RI or PB alternatives to demonstrate compliance with 10 CFR 50.48(c) (10 CFR 50.48(c)(4) (if applicable)		
2	The LAR describes how the licensee complies with the fundamental FPP and design elements in Chapter 3 of NFPA 805; the LAR describes the licensee’s approach.		
2.1	The LAR justifies use of the italicized exception in Section 3.6.4 of NFPA 805 per 10 CFR 50.48(c)(2)(vii) for water supply and distribution (if applicable)		
2.2	The LAR identifies structures that comprise the “power block.”		
2.3	The LAR addresses electrical raceway fire barrier system issues (e.g., Hemyc and MT) if applicable.		
3.1	The LAR describes the licensee’s approach to establishing nuclear safety performance criteria and the results of implementing the approach.		

RI/PB FPP License Amendment Request Acceptance Review Matrix

SRP III.	Required Information	Sufficient for Review?	Comments
	The LAR includes the engineering analyses required by NFPA 805, Section 2.4		
	The LAR documents the comparison of the existing FPP with the requirements of NFPA 805		
	The LAR summarizes the current licensing basis including the applicable regulatory requirements		
3.1.1	The LAR discusses use of feed-and-bleed for post fire		
3.1.2	The LAR discusses flame propagation ratings of existing cables and the basis for the ratings and provides flame propagation ratings for new or replacement cables.		
3.1.3	The LAR discusses fire-induced multiple spurious operations of equipment		
3.2	The LAR evaluates each fire area for compliance to NFPA 805 requirements:		
	Description of use of the deterministic approach of NFPA 805 paragraph 4.2.3 are met, as applicable		
	Documentation of previous NRC approval		
	EEEEEs that support deviations from the requirements and methods of NFPA 805		
	OMAs that will transition to recovery actions		
	Description of use of the fire modeling approach of NFPA 805 paragraph 4.2.4.1, as appropriate		
	Statement that licensee has provided operational guidance required by NFPA 805 4.2.4.1.6		
	Description of use of the fire risk approach of NFPA 805 paragraph 4.2.4.2, as appropriate		
	Description of use of RI/PB alternatives to NFPA 805 if approved (or approval requested) per 50.48(c)(4)		
	Compliance summary for each fire area, including identifying fire hazards, reporting CDF and LERF		

RI/PB FPP License Amendment Request Acceptance Review Matrix

SRP III.	Required Information	Sufficient for Review?	Comments
	values, identifying the significant core damage sequences and initiating events		
	Exemptions, deviations, and EEEEs that the licensee desires to incorporate into the new licensing basis		
3.3	The LAR describes fire protection during NPOs and the procedures to address fire risk during these modes		
4	The LAR describes how the radioactive release performance criteria are met		
5.1	The LAR describes the fire PRA technical adequacy, including: evaluation against appropriate standards process for PRA model maintenance/update technical adequacy for any NFPA 805 required risk assessments technical adequacy for any applications for which the licensee is requesting self-approval		
5.2	The LAR describes how DID and safety margins are maintained.		
5.3	The LAR includes plant change evaluations for non-compliances (based on current deterministic requirements) that the licensee does not intend to bring into deterministic compliance under NFPA 805 The LAR includes the total change in CDF and LERF due to all non-compliances, including plant changes planned for the transition to NFPA 805. The LAR provides the total CDF and LERF, i.e., risk contributions from internal and external events, including internal fires (if required to address the acceptance guidance of RG 1.174 and SRP Section 19.2)		
5.4	The LAR provides the risk of crediting recovery		

RI/PB FPP License Amendment Request Acceptance Review Matrix

SRP III.	Required Information	Sufficient for Review?	Comments
	actions in lieu of meeting the deterministic requirements of NFPA 805 Section 4.2.3		
5.5	The LAR includes fire risk evaluations per NFPA 805 Section 4.2.4.2 including an integrated assessment of the acceptability of risk, DID, and safety margins.		
5.6	The LAR provides the cumulative risk if applicable. The LAR provides the individual risk of changes when changes are combined into a group for the purposes of evaluating risk.		
6	The LAR describes the proposed monitoring program to monitor acceptable levels of availability, reliability, and performance of fire protection systems and features		
7.1	The LAR describes of the FPP design basis document		
7.2	The LAR describes the configuration control process for the FPP design basis document		
7.3	The LAR describes the program to ensure quality requirements are met		