



DRAFT REGULATORY GUIDE

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DRAFT REGULATORY GUIDE DG-1218

(Proposed Revision 1 of Regulatory Guide 1.205, dated April 2006)

RISK-INFORMED, PERFORMANCE-BASED FIRE PROTECTION FOR EXISTING LIGHT-WATER NUCLEAR POWER PLANTS

A. INTRODUCTION

This regulatory guide provides guidance for use in complying with the requirements that the U.S. Nuclear Regulatory Commission (NRC) has promulgated for risk-informed, performance-based fire protection programs (FPPs) that comply with Title 10, Section 50.48(c), of the *Code of Federal Regulations* (10 CFR 50.48(c)) (Ref. 1) and the referenced 2001 Edition of the National Fire Protection Association (NFPA) standard, NFPA 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants" (Ref. 2).

In accordance with 10 CFR 50.48(a), each operating nuclear power plant must have an FPP that satisfies General Design Criterion (GDC) 3, "Fire Protection," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities" (Ref. 3). In addition, plants that were licensed to operate before January 1, 1979, must meet the requirements of Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to 10 CFR Part 50 (Ref. 4), except to the extent provided for in 10 CFR 50.48(b). Plants licensed to operate after January 1, 1979, are required to comply with 10 CFR 50.48(a), as well as any plant-specific fire protection license conditions and technical specifications.

This regulatory guide is being issued in draft form to involve the public in the early stages of the development of a regulatory position in this area. It has not received final staff review or approval and does not represent an official NRC final staff position.

Public comments are being solicited on this draft guide (including any implementation schedule) and its associated regulatory analysis or value/impact statement. Comments should be accompanied by appropriate supporting data. Written comments may be submitted to the Rulemaking, Directives, and Editing Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; e-mailed to nrcprep_resource@nrc.gov; submitted through the NRC's interactive rulemaking Web page at <http://www.nrc.gov>; or faxed to (301) 492-3446. Copies of comments received may be examined at the NRC's Public Document Room, 11555 Rockville Pike, Rockville, MD. Comments will be most helpful if received by May 22, 2009.

Electronic copies of this draft regulatory guide are available through the NRC's interactive rulemaking Web page (see above); the NRC's public Web site under Draft Regulatory Guides in the Regulatory Guides document collection of the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/doc-collections/>; and the NRC's Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>, under Accession No. ML090420462.

Paragraph (c) of 10 CFR 50.48, adopted by the NRC in 2004 (69 *Federal Register* (FR) 33536; June 16, 2004) (Ref. 5), incorporates NFPA 805 by reference, with certain exceptions, and allow licensees to voluntarily adopt and maintain an FPP that meets the requirements of NFPA 805 as an alternative to 10 CFR 50.48(b) or the plant-specific fire protection license conditions. Licensees who choose to comply with 10 CFR 50.48(c) must submit a license amendment application to the NRC, in accordance with 10 CFR 50.90, “Application for Amendment of License, Construction Permit, or Early Site Permit.” Paragraph (c)(3) in 10 CFR 50.48 describes the required contents of the application.

The Nuclear Energy Institute (NEI) has developed NEI 04-02, Revision 2, “Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c),” issued April 2008 (Ref. 6), to assist licensees in adopting 10 CFR 50.48(c) and making the transition from their current FPP to one based on NFPA 805. This regulatory guide endorses portions of NEI 04-02, Revision 2, where it has been found to provide methods acceptable to the NRC for implementing NFPA 805 and complying with 10 CFR 50.48(c). The regulatory positions in Section C below include clarification of the guidance provided in NEI 04-02, as well as any NRC exceptions to the guidance. The regulatory positions in Section C take precedence over the guidance in NEI 04-02.

All references to NEI 04-02 in this regulatory guide refer to Revision 2 of that NEI guidance document. All references to NFPA 805 in this regulatory guide refer to the 2001 Edition of NFPA 805. Where this regulatory guide refers to an FPP or license of a nuclear power plant as being in compliance with, or meeting, the requirements of NFPA 805, the staff means compliance with NFPA 805 and the applicable portions of 10 CFR 50.48(c).

The NRC issues regulatory guides to describe to the public methods that the staff considers acceptable for use in implementing specific parts of the agency’s regulations, to explain techniques that the staff uses in evaluating specific problems or postulated accidents, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations and compliance with them is not required.

This regulatory guide contains information collection requirements covered by 10 CFR Part 50 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0011. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

B. DISCUSSION

Background

The fire protection requirements of 10 CFR 50.48(b), 10 CFR Part 50, Appendix R, and the associated regulatory guidance, are prescriptive in that they identify specific methods for assuring nuclear safety in the event of a fire. The industry and some members of the public have characterized these requirements as creating an unnecessary regulatory burden to achieve an acceptable level of fire safety and comply with the general, performance-based requirements of GDC-3. The NRC has issued approximately 900 plant-specific exemptions to the requirements of Appendix R.

In SECY-98-058, “Development of a Risk-Informed, Performance-Based Regulation for Fire Protection at Nuclear Power Plants,” dated March 26, 1998 (Ref. 7), the staff proposed to the Commission that the staff work with NFPA and industry to develop a risk-informed, performance-based

voluntary consensus standard for nuclear power plant fire protection. This voluntary consensus standard could be endorsed in future rulemaking as an alternative set of fire protection requirements to the existing regulations in 10 CFR 50.48, "Fire Protection." In SECY-00-0009, "Rulemaking Plan, Reactor Fire Protection Risk-Informed, Performance-Based Rulemaking," dated January 13, 2000 (Ref. 8), the NRC staff requested and received Commission approval to proceed with a rulemaking to permit reactor licensees to adopt NFPA 805 voluntarily as an alternative to existing fire protection requirements. On February 9, 2001, the NFPA Standards Council approved the 2001 Edition of NFPA 805 as an American National Standard for performance-based fire protection for light-water nuclear power plants.

Effective July 16, 2004, the Commission amended its fire protection requirements in 10 CFR 50.48 to add 10 CFR 50.48(c), which incorporates by reference the 2001 Edition of NFPA 805, with certain exceptions, and allows licensees to apply for a license amendment to comply with the 2001 Edition of NFPA 805 (69 FR 33536). Subsequent editions of NFPA 805 have been issued but are not endorsed by the regulation.

In parallel with the Commission's efforts to promulgate a rule endorsing the risk-informed, performance-based fire protection provisions of NFPA 805, NEI worked with the industry to develop implementing guidance for the specific provisions of NFPA 805 and 10 CFR 50.48(c). NEI published such guidance in NEI 04-02, Revision 2, in April 2008. This regulatory guide provides the NRC staff's position on NEI 04-02 and offers additional information and guidance to supplement the NEI document and assist licensees in meeting the NRC's regulations related to adopting a risk-informed, performance-based FPP in 10 CFR 50.48(c).

Fire Protection Program Changes

Before the promulgation of 10 CFR 50.48(c), plants typically adopted a standard fire protection license condition. Under this condition, the licensee could make changes to the approved FPP, without prior NRC approval, only if the changes would not adversely affect the plant's ability to achieve and maintain safe shutdown in the event of a fire. Paragraph (c) in 10 CFR 50.48 requires licensees choosing to adopt NFPA 805 to identify license conditions to be revised or superseded. Licensees should request a new fire protection license condition that will define the revised bases for making changes to the approved NFPA 805 FPP without prior NRC approval.

Appendices to NFPA 805

As discussed in the Statements of Considerations for the final rulemaking (Ref. 5), which incorporated by reference NFPA 805, the appendices to NFPA 805 are not considered part of the rule. However, Appendices A-D of NFPA 805 provide information that may be useful to licensees in implementing the requirements of NFPA 805.

Fire Probabilistic Risk Assessment

Although a licensee may transition to an NFPA 805-based FPP without a fire probabilistic risk assessment (PRA)¹ model, the NRC anticipates that licensees will develop a plant-specific fire PRA in

¹ The NRC considers probabilistic safety analysis (PSA) and probabilistic risk analysis (PRA) to be synonymous. PRA will be used in this regulatory guide. The term "fire PRA," as used in this regulatory guide, encompasses all levels and types of PRAs, including pre-NUREG/CR-6850-based fire PRAs, the fire portions of individual plant examinations of external events, and enhanced internal events PRAs.

order to fully realize the safety and cost benefits of transitioning to NFPA 805. This is because a fire PRA forms the basis for risk-informed changes to the FPP that can be made without prior NRC review and approval under the revised plant license condition as described in Regulatory Position 3.1.

C. REGULATORY POSITION

1. Nuclear Energy Institute Document NEI 04-02

1.1 General

This regulatory guide endorses the guidance in NEI 04-02, Revision 2 (April 2008), which provides methods acceptable to the staff for adopting an FPP consistent with the 2001 Edition of NFPA 805 and 10 CFR 50.48(c), subject to the regulatory positions and exceptions described below.

NEI 04-02 provides detailed guidance applicable to many of the regulatory requirements of 10 CFR 50.48(c) and NFPA 805. The guidance in this regulatory guide sets forth regulatory positions, emphasizes certain issues, clarifies the requirements of 10 CFR 50.48(c) and NFPA 805, clarifies the guidance in NEI 04-02, and modifies the NEI 04-02 guidance where required. Should a conflict occur between NEI 04-02 and this regulatory guide, the positions in this regulatory guide govern.

1.2 Exceptions and Clarifications

Specific exceptions and clarifications of the NRC's endorsement of NEI 04-02 are as follows:

- a. The NRC's endorsement of NEI 04-02 does not imply the NRC's endorsement of the references cited in NEI 04-02. The guidance provided in these references has not necessarily been reviewed and approved by the NRC, except where specifically noted in this regulatory guide.
- b. NEI 04-02 includes examples to supplement the guidance. These examples are illustrative only, and each licensee should ensure that an example is applicable to its particular circumstances before implementing the guidance as described in an example.
- c. NEI 04-02 often refers to requirements in NFPA 805 and 10 CFR 50.48(c). In some cases, NEI 04-02 suggests that the requirements are voluntary (e.g., "should" used in place of "shall"). Licensees are required to comply with the applicable regulations, unless an exemption is granted under 10 CFR 50.12, "Specific Exemptions." Licensees should follow the words of 10 CFR 50.48(c), which incorporates by reference the text of NFPA 805, 2001 Edition, if there are conflicts with NEI 04-02.
- d. NEI 04-02 states that licensees can use the performance-based methods of NFPA 805 to support changes to their current, pre-transition licensing bases. The NRC does not endorse this guidance, as it is not within the scope of this regulatory guide.
- e. NEI 04-02 states "a substantial part of an existing fire protection program can be transitioned to a new NFPA 805 licensing basis by performing a transition review..." While this statement may be true for some licensees, it should not be interpreted to mean that the existing FPP, a priori, complies with the requirements of 10 CFR 50.48(c). Licensees should verify that portions of the

existing FPP that are to be so “transitioned” do in fact comply with the requirements of NFPA 805.

- f. NEI 04-02 states that, if operator manual actions that are not allowed under the current regulatory framework or do not have previous NRC approval become recovery actions, they should be evaluated using the change process. While the NRC endorses this guidance, all recovery actions must be addressed using performance-based methods, as required by NFPA 805, Section 4.2.4 (see Regulatory Position 2.4).
- g. NEI 04-02 states that existing engineering equivalency evaluations (EEEs) are an acceptable alternative to the deterministic requirements in NFPA 805, Section 4.2.3. The NRC endorses this guidance only if the conditions identified in Regulatory Position 2.3.2 are met.
- h. NEI 04-02 lists examples of changes that would not require a license amendment, after a plant has made the transition to NFPA 805, using a plant-specific license condition that permits self-approval of some changes. The NRC does not endorse this list. The plant-specific license condition identifies the types of changes that can be self-approved.
- i. NEI 04-02 provides a sample standard license condition, which the NRC does not endorse. The NRC-endorsed sample standard license condition is provided in Regulatory Position 3.1.
- j. NEI 04-02 identifies FPP changes that require NRC review and approval before implementation. The NRC endorses this guidance with the following exception: combined changes also require prior NRC review and approval if any part of those changes would fail to meet the risk acceptance criteria of the approved license condition (see Regulatory Position 3.2.3).
- k. NEI 04-02 references a fire model verification and validation (V&V) standard. The NRC does not endorse the fire model V&V standard referenced in NEI 04-02. An NRC analysis used the “Standard Guide for Evaluating the Predictive Capability of Deterministic Fire Models” of the American Society for Testing and Materials (ASTM E1355-05a, 2005) (Ref. 9) as a standard to conduct V&V on parts of five different fire models, as described in Regulatory Position 4.2.
- l. NEI 04-02, Section 1.5, states that the terms “current licensing basis (CLB)” and “pre-transitional fire protection licensing basis” are used interchangeably in the document. The NRC does not endorse the use of CLB in this context, because CLB is used in 10 CFR Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants” (Ref. 10), and in 10 CFR 50.54(f) (Ref. 11) with a different meaning. The NRC has no objection to using “pre-transitional fire protection licensing basis.”
- m. NEI 04-02, Section 2.2.1, states that licensees can request the NRC’s Office of General Counsel for an informal NRC opinion of the acceptability of an interpretation by the NFPA. The NRC Office of General Counsel does not provide informal advice or informal interpretations to outside entities.
- n. NEI 04-02, Section 2.3.1, includes two bulleted items that set forth strategies a licensee may use to demonstrate prior NRC approval of a particular FPP attribute. The NRC does not endorse the second bullet, which contains a discussion that would imply that there can be tacit acceptance by the NRC of a particular FPP attribute. The NRC’s acceptance should be demonstrated either by an explicit statement of the particular FPP attribute, or by a demonstration that a specific FPP

attribute was explicitly made known to the NRC and that the NRC's acceptance can reasonably be interpreted as including the specific FPP attribute.

- o. Section 4.6.1 of NEI 04-02 provides a list of key items that should be included in a license amendment request. Appendix H to NEI 04-02 provides a license amendment template. The information provided may not be complete; for example, the list in Section 4.6.1 does not include submitting information to support the quality of the PRA models or the use of such models in performing NFPA 805 risk assessments. The licensee should ensure that it submits all information required by applicable regulations and necessary for the NRC to make its safety finding on the application. The NRC will determine the acceptability of the application in accordance with its regulations and procedures, including 10 CFR Part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders" (Ref. 12).
- p. NEI 04-02, Section 2.3.3, discusses the NRC's interim enforcement discretion policy pertaining to licensees that make the transition to NFPA 805. The NRC does not endorse this section because it is out of date and does not properly characterize the NRC's policy. Licensees should consult the NRC Web site for current information on enforcement discretion at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>).
- q. Appendix D to NEI 04-02 and Appendix C to NFPA 805 contain detailed discussions that may be useful to licensees in determining which fire models to use and in applying those fire models within their limitations. However, the NRC only endorses these appendices to the extent described in Regulatory Position 4.2. Analyses performed by licensees using the information in these appendices should include adequate technical justification for methodologies and data, as appropriate.

2. License Transition Process

2.1 Transition Schedule

Paragraph (c) in 10 CFR 50.48 does not mandate a specific schedule for implementing an FPP that meets the provisions of NFPA 805. However, the statement of considerations for 10 CFR 50.48(c) states that the license amendment approving a licensee's request to use NFPA 805 will include a license condition imposing the use of NFPA 805, together with an implementation schedule. Licensees should include an implementation schedule with their request to adopt an NFPA 805 FPP. Also, licensees that wish to take advantage of the Commission's interim enforcement discretion policy for fire protection will need to establish an implementation schedule consistent with that enforcement policy.

2.2 License Amendment Request

2.2.1 *Uncertain Elements of Current Fire Protection Programs*

The NRC may not have specifically approved certain aspects of the plant's current FPP (e.g., through an approved 10 CFR 50.12 exemption request). This has resulted in uncertainty in licensees' fire protection licensing bases. Licensees should submit uncertain elements of their plant's FPP, such as the crediting of recovery actions and circuit analysis methods, if they want explicit approval of these elements under 10 CFR 50.48(c). Any submittal addressing these FPP elements should include sufficient detail to allow the NRC to assess whether the licensee's treatment of these elements meets 10 CFR 50.48(c) requirements.

2.2.2 *Performance-Based Methods for Fire Protection Program Elements and Minimum Design Requirements*

Under 10 CFR 50.48(c)(2)(vii), a licensee may request NRC approval (by license amendment) to use NFPA 805 performance-based methods in determining the licensee's compliance with the FPP elements and minimum design requirements in Chapter 3 of NFPA 805. A licensee should provide sufficient information in the license amendment request to allow the NRC staff to determine that the performance-based approach:

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

2.2.3 *Risk-Informed or Performance-Based Alternatives to Compliance with NFPA 805*

Under 10 CFR 50.48(c)(4), a licensee may request NRC approval (by license amendment) of the use of alternative risk-informed or performance-based methods (i.e., methods that differ from those prescribed by NFPA 805) to demonstrate compliance with 10 CFR 50.48(c). A licensee should provide sufficient information in the license amendment request to allow the NRC staff to determine that the proposed alternatives:

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

A license amendment request can either describe alternative risk-informed, performance-based methods that have been approved by the NRC before their incorporation in the licensee's FPP or refer to alternative risk-informed, performance-based methods that are documented in topical reports that have been previously approved by the NRC and through which the licensee can demonstrate that the alternative is applicable for its intended use.

The license amendment request should include complete and concise details of each of the proposed methods. Where the performance-based methods have been adequately described in the license amendment request and have been accepted by the NRC, these methods may be applied to the licensee's FPP upon issuance of a license amendment approving the methods. A licensee may apply these approved methods within the limits specifically described in its licensing basis to implement plant changes that affect the FPP.

Licensee self-approval of FPP changes using approved performance-based methods may be granted in the fire protection license condition when appropriate. Subsequent changes to the approved

performance-based methodology must be submitted for NRC review and approval (through a license amendment request) before being applied to the licensee's FPP.

2.2.4 Risk Evaluations

The license amendment request should clearly demonstrate that the requirements of 10 CFR 50.48(c) and NFPA 805 will be met once transition is complete. This includes providing analyses and results of any required risk assessments. The use of the NFPA 805, Section 4.2.4.2, fire risk evaluation requires comparing the difference in risk between the deterministic requirements of NFPA 805, Section 4.2.3, and the proposed alternative. If the use of recovery actions has led to the performance-based approach, the additional risk presented by their use must be evaluated in accordance with NFPA 805, Section 4.2.4. This risk evaluation should use fire modeling or other engineering analyses (e.g., NFPA 805, Section 4.2.4.1) or probabilistic methods (e.g., NFPA 805, Section 4.2.4.2). A bounding approach may be acceptable. Any risk increases may be combined with risk decreases when estimating the total risk change to be reported in the license amendment request, as described in Regulatory Position 3.2.5.

The change in risk (both in terms of core damage frequency (CDF) and large early release frequency (LERF)) should be determined and provided individually for each fire area and collectively for all fire areas that do not meet the deterministic requirements of NFPA 805 and for which a quantitative risk-informed, performance-based approach is applied using NFPA 805, Section 4.2.4.2. The change in risk should be the difference between the post-transition plant configuration and the NFPA 805, Section 4.2.3, deterministically compliant configuration.

The total change in risk associated with the implementation of NFPA 805 should be consistent with the acceptance guidelines in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," issued November 2004 (Ref. 13). The quality of the risk assessments should be consistent with Regulatory Position 4.3.

Upon completing the transition to an NFPA 805 licensing basis, including completing all plant modifications and changes that the licensee has committed to make, the baseline risk will be the risk of the plant as-built, as-operated, and maintained from that point onward, according to the NRC-approved FPP licensing basis.

2.2.5 Non-power Operational Modes

The scope of NFPA 805 requires licensees to address the impacts of fires during all phases of plant operation, including shutdown, degraded conditions, and decommissioning. Section 4.3.3 and Appendix F to NEI 04-02 provide detailed guidance on one acceptable approach to addressing fires during non-power operational modes.

2.2.6 Radioactive Release Transition

A licensee's FPP must comply with the radioactive release performance criteria in NFPA 805, Section 1.5.2. The license amendment request should clearly demonstrate that this requirement will be met once the transition is complete. The licensee should address methods for achieving the performance criteria for both smoke and suppression agents, on a fire-area-by-fire-area basis, during full-power and

low- or non-power operations, and address the potential for cross-contamination (water run-off and smoke from a contaminated area being directed through an uncontaminated area), and include the following:

- a. the methodology used to identify which systems, components, and flow paths are used to meet the release criteria;
- b. the identification of FPP elements, including measures, systems, procedural control actions, and flow paths, credited to meet the criteria;
- c. a description of plant programs, such as fire brigade training and equipment maintenance, that are relied upon to sustain equipment reliability and fire brigade performance; and
- d. a bounding analysis, qualitative risk analysis, or quantitative risk analysis that demonstrates the release criteria have been met.

NEI 04-02 Section 4.3.4 and Appendix G provide additional guidance related to this topic.

2.3 Carryover of Current Fire Protection Programs into NFPA 805

In certain cases, the NRC may have granted exemptions or deviations from the licensee's current FPP that would be acceptable alternatives to the NFPA 805 requirements. Where prior NRC approval of such alternatives exists, licensees should reference documentation of that approval.

2.3.1 *Previously NRC-Approved Alternatives to NFPA 805, Chapter 3, Fundamental Fire Protection Program and Design Elements*

NFPA 805 states that previously approved alternatives to the fundamental FPP attributes identified in Chapter 3 take precedence over the requirements in NFPA 805, Chapter 3. Existing exemptions to these Chapter 3 attributes are previously approved alternatives from the fundamental protection program attributes and, therefore, take precedence over the requirements in NFPA 805, Chapter 3, provided the NRC staff determines that the licensee has acceptably addressed the continued validity of any exemption in effect at the time of application. The term "valid" used in this context means that the technical basis for approval of the original exemption still applies and is correct (e.g., plant modifications or other changes have not invalidated the assumptions or analysis that formed the basis for the exemption; new information has not surfaced that would invalidate the original finding).

The NRC's approval of the licensee's request to implement an FPP based on NFPA 805 should reference the valid exemption as the basis for meeting the applicable Chapter 3 requirement. The NRC will ordinarily rescind the original exemption in the license amendment, since the NRC's approval to use 10 CFR 50.48(c) and NFPA 805 in most cases effectively negates the licensee's need for the exemption.

2.3.2 *Previously NRC-Approved Alternatives to NFPA 805, Section 4.2.3, Deterministic Requirements*

NFPA 805, Section 2.2.7, defines EEEEs and states that, when applying a deterministic approach, EEEEs may be used to demonstrate compliance with the specific deterministic fire protection design requirements in Chapter 4 for existing plant configurations. These EEEEs are required to clearly demonstrate an equivalent level of fire protection compared to the deterministic requirements.

In the past, licensees have requested and received exemptions to the specific requirements in current fire protection regulations (i.e., Appendix R). Existing exemptions may be used to demonstrate compliance with the specific deterministic fire protection design requirements in Chapter 4 of NFPA 805, provided the NRC staff determines that the licensee has acceptably addressed the continued validity of any exemption in effect at the time of application and that the exemption does not involve a recovery action as defined in NFPA 805, Section 1.6.52 (see also Regulatory Position 2.4). The term “valid” used in this context means that the technical basis for approval of the original exemption still applies and is correct (e.g., plant modifications or other changes have not invalidated the assumptions or analysis that formed the basis for the exemption; new information has not surfaced that would invalidate the original finding).

The NRC’s approval of the licensee’s request to implement an FPP based on NFPA 805 should reference the valid exemption as the basis for demonstrating an equivalent level of fire protection as permitted under Section 2.2.7 of NFPA 805. The NRC will ordinarily rescind the original exemption in the license amendment, since the NRC’s approval to use 10 CFR 50.48(c) and NFPA 805 in most cases effectively negates the licensee’s need for the exemption.

A licensee may use EEEEs as described in Section 2.2.7 of NFPA 805 to demonstrate equivalency to the deterministic requirements in cases where an exemption was not granted, provided the following are true:

- a. The EEEE clearly demonstrates an equivalent level of fire protection compared to the deterministic requirements in NFPA 805, Chapter 4.
- b. The EEEE is based on deterministic and not performance-based methods.
- c. The EEEE does not include any recovery actions as defined in NFPA 805, Section 1.6.52.

One type of EEEE, commonly referred to as a “Generic Letter 86-10 (GL 86-10) evaluation” (Ref. 14), permits licensees that have adopted the GL 86-10 fire protection license condition to make changes to their approved FPP without prior NRC approval if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. These changes may not have been reviewed and approved by the NRC and may not necessarily demonstrate an equivalent level of fire protection compared to the deterministic requirements required by Section 2.2.7 of NFPA 805. A GL 86-10 evaluation that meets the three conditions listed above for EEEEs, shows no adverse effect on safe shutdown, and is permitted under the licensee’s current licensing basis, is one acceptable means of meeting the EEEE acceptance criterion above.

NEI 04-02, Section 4.1.1, notes that the licensee should review EEEEs during the transition process to ensure that the quality level and basis for acceptability are still valid. Except as noted above, satisfactory results from this review should provide an adequate basis to show that the EEEEs meet the deterministic requirements of Chapter 4 of NFPA 805. Guidance for acceptable EEEEs appears in Section 9.5.1 of NUREG-0800, Revision 5, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants,” issued March 2007 (Ref. 15), and in Regulatory Guide 1.189, “Fire Protection for Nuclear Power Plants,” issued March 2007 (Ref. 16).

EEEEs that support deviations from the requirements or methods of NFPA 805 must be submitted for NRC approval in accordance with 10 CFR 50.48(c). Of the EEEEs that the NRC must approve, those

that are preexisting and those performed during the transition to an NFPA 805 licensing basis should be submitted with the fire protection license amendment request.

2.4 Recovery Actions

Recovery actions as defined in NFPA 805, Section 1.6.52, do not meet the deterministic requirements in Section 4.2.3 of NFPA 805. Consequently, the licensee must address recovery actions, whether or not previously approved by the NRC, using the performance-based methods in Section 4.2.4, as required by NFPA 805, Section 4.2.3.1, and must evaluate the additional risk of their use according to NFPA 805, Section 4.2.4.

NFPA 805, Section 1.6.52, defines a recovery action as “activities to achieve the nuclear safety performance criteria that take place outside of the main control room or outside of the primary control station(s) for the equipment being operated, including the replacement or modification of components.”

For components that have controls in the main control room, operation of that component from any other location would be considered a recovery action if such operation were needed to achieve the nuclear safety performance criteria. For components that do not have controls in the main control room, the primary control station is that location from which the component would normally be operated.

Therefore, the following applies to primary control stations:

- a. The control station for a system or component is considered to be primary if it is the location where that system or component is normally operated. This situation applies to various auxiliary systems that are normally operated at a local control station by in-plant operators. NFPA 805 allows the use of this equipment using the local control station without considering it a recovery action.
- b. The controls for a system or component specifically installed to meet the “dedicated shutdown” option of Appendix R, Section III.G.3, are also considered to be primary. A system or component that has been specifically installed under the dedicated shutdown concept is a system or component that is operated from a location outside the control room (normally the remote, or alternate, shutdown panel) and is fully separated from the fire area where its use is credited. Similar to the previous item, this component cannot be operated from the control room. Operation of dedicated shutdown equipment from the remote, or alternate, shutdown panel would not be considered a recovery action since this would be the primary control station.

A special case exists for the controls for systems and components that have been modified to meet the “alternative shutdown” option in Appendix R, Section III.G.3, to 10 CFR Part 50, to provide independence and electrical separation from the control room to address a fire-induced control room evacuation. (This configuration is normally referred to as either a “remote shutdown panel” or “auxiliary shutdown panel.”) These systems and components rely on a recovery action to achieve the design intent. This recovery action includes the decision to abandon the main control room and transfer control to the remote shutdown panel, as well as any actions needed to make the transfer (e.g., electrical transition). Once the recovery action is completed, the remote shutdown panel may be considered a “primary control station” under NFPA 805 rules. Note that this is only after the recovery action has electrically isolated the panel. The additional risk of this recovery action must be evaluated according to NFPA 805, Section 4.2.4. This risk assessment should consider such factors as the time required to: detect the fire; reach untenable conditions in the control room (or reach a challenging fire in another fire area where the

remote shutdown panel is credited); make the decision to proceed to the remote, or auxiliary, shutdown panel; and complete the transfer to an alternative shutdown configuration.

To be considered a primary control station as discussed above, the remote, or alternative, shutdown panel should meet the following criteria:

- a. The location should be considered the primary command and control center when the main control room can no longer be used. The control room team will evacuate to this location and use its alternative shutdown controls to safely shut down the plant.
- b. The location should have the requisite system and component controls, plant parameter indications, and communications so that the operator can adequately and safely monitor and control the plant using the alternative shutdown equipment.
- c. There should be more than one component being controlled from this location (a local control station provided to allow an individual component to be locally controlled, as in the local handwheel on a motor-operated valve, does not meet this definition).

3. NFPA 805 Fire Protection Program

NFPA 805 refers to “the authority having jurisdiction (AHJ).” The NRC is the AHJ for purposes of nuclear health and safety and common defense and security.

3.1 Standard License Condition

As specified in 10 CFR 50.48(c)(3)(i), the license amendment request must identify any license conditions to be revised or superseded. Paragraph (c) in 10 CFR 50.48 and NFPA 805 identify aspects of a performance-based FPP that must be specifically approved by the NRC through a license amendment. It is the intent of 10 CFR 50.48(c) to allow certain changes to be made to the FPP without prior NRC review and approval, once the NRC approves the transition to an FPP controlled by NFPA 805. This intent is reflected in the regulatory analysis for 10 CFR 50.48(c), which states, “Licensees choosing to use the flexibilities provided by the rulemaking could use risk-informed and performance-based approaches and methods in NFPA 805, rather than submitting an exemption or deviation request each time they wish to depart from current requirements.”

The NRC intends to provide this flexibility to make certain changes without prior NRC review and approval in a license condition for licensees that make the transition to 10 CFR 50.48(c). A sample license condition, which includes acceptance criteria for making changes to the licensee’s FPP without prior NRC review and approval, is shown below. The application of these risk acceptance criteria requires that the plant have an acceptable fire PRA that is in accordance with the guidance in Regulatory Position 4.3:

(Name of Licensee) shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the licensee amendment request dated _____ and as approved in the safety evaluation report dated _____ (and supplements dated _____). Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c) and NFPA 805, and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of

the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be appropriate for the nature and scope of the change being evaluated, be based on the as-built, as-operated, and maintained plant, and reflect the operating experience at the plant. The risk assessment of the change will use methods previously approved by the NRC. Previously approved methods may include plant-specific NRC approval through a license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, where the NRC's generic approval clearly states that the method may be applied without a plant-specific license amendment being granted.

- (a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense in depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the change evaluation.
- (b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than $1 \times 10^{-7}/\text{yr}$ for CDF and less than $1 \times 10^{-8}/\text{yr}$ for LERF. The proposed change must also be consistent with the defense in depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the change evaluation.

Other Changes that May Be Made Without Prior NRC Approval {Include a plant-specific list of any non risk-informed changes to the FPP.}

Transition License Conditions

- (1) Before achieving full compliance with 10 CFR 50.48(c), the licensee's fire protection program may not be modified as allowed above.
- (2) The licensee shall implement the following modifications to its facility to complete transition to full compliance with 10 CFR 50.48(c) by {date}: {Include a plant-specific list of any modifications identified by the licensee as necessary to complete transition to its new fire protection license basis.}
- (3) The licensee shall maintain appropriate compensatory measures in place until completion of the modifications delineated above.

3.2 NFPA 805 Plant Change Evaluation Process

3.2.1 *Definition of a Change*

NFPA 805 includes provisions for licensees to make changes to their approved FPPs once the transition to an NFPA 805 license is complete. Sections 2.2.9 and 2.4.4 of NFPA 805 require a "plant change evaluation" for any change to a previously approved FPP element. In the context of an NFPA 805 FPP that complies with 10 CFR 50.48(c), a change may be any of the following:

- 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 not in compliance with the plant's FPP.

The requirements of 10 CFR 50.48(c) and the guidance provided in this regulatory guide for evaluating changes are applicable regardless of when the noncompliance is identified (during or after the transition to an NFPA 805 license).

For changes that involve acceptance of an existing unapproved condition (i.e., a noncompliance), appropriate compensatory measures should be established and should remain in place until either the plant is modified to achieve compliance or the condition is found acceptable. Acceptance of the as-found condition may be the result of either the NRC's review and approval or, following implementation of NFPA 805, the self-approval process in the licensee's fire protection license condition.

3.2.2 *Plant Change Evaluations*

The licensee should perform an engineering evaluation to demonstrate acceptability of the change in terms of the plant change evaluation criteria and compliance with the fire protection requirements of 10 CFR 50.48(a) and NFPA 805. The plant change evaluation process includes an integrated assessment of the acceptability of the change in risk, defense in depth, and safety margins, regardless of the methods or approaches used to evaluate the change.

Under NFPA 805, Section 1.2, fire protection defense in depth is achieved when an adequate balance of each of the following elements is provided:

- a. preventing fires from starting;
- b. rapidly detecting fires and controlling and extinguishing promptly those fires that do occur, thereby limiting fire damage; and
- c. providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed.

Nuclear safety defense in depth is achieved when a reasonable balance is preserved among prevention of core damage, prevention of containment failure, and mitigation of consequences. Therefore, consistency with the defense in depth philosophy for fire protection and nuclear safety is maintained if the following acceptance guidelines, or their equivalent, are met:

- a. Overreliance on programmatic activities to compensate for weaknesses in plant design is avoided.
- b. System redundancy, independence, and diversity are preserved, commensurate with the expected frequency of challenges, consequences of failure of the system, and associated uncertainties.
- c. Defenses against potential common-cause failures are preserved, and the potential introduction of new common-cause failure mechanisms is assessed.

- d. The independence of fission product barriers is not degraded.
- e. Defenses against human errors are preserved.
- f. The intent of the GDC in Appendix A to 10 CFR Part 50 is preserved.

3.2.3 *NRC Approval of Fire Protection Program Changes*

The following FPP changes are examples of changes that must be submitted for NRC review and approval through a license amendment request before implementation:

- a. changes that do not meet the acceptance criteria of the approved license condition;
- b. changes to the fundamental FPP elements and design requirements of Chapter 3 of NFPA 805, including any request to use performance-based methods for these elements as permitted under 10 CFR 50.48(c)(2)(vii);
- c. changes that have been evaluated using risk-informed or performance-based alternatives to compliance with NFPA 805, where the alternatives have not been approved for use by a license amendment, as required by 10 CFR 50.48(c)(4); and
- d. combined changes where any part would not meet the risk acceptance criteria of the approved license condition.

3.2.4 *Plant Changes Without Prior NRC Approval*

The sample standard license condition in Regulatory Position 3.1 sets forth criteria for making changes to the approved NFPA 805 FPP without prior NRC approval. The risk acceptance criteria for plant changes provided in this sample standard license condition are acceptable to the NRC.

Where permitted by the approved fire protection license condition, licensees of plants that have a fire PRA that is in accordance with Regulatory Position 4.3 may make changes without prior NRC review and approval. The types of plant changes that may be approved without prior NRC review and approval will be limited to those for which the risk assessment methods are adequate to demonstrate that any increase in risk will continue to meet the risk acceptance criteria. Risk assessment methods are adequate if the method used to estimate the change has been previously reviewed and approved by the NRC and the PRA meets the guidance in Regulatory Position 4.3. Licensees must also maintain appropriate levels of defense in depth and adequate safety margins.

3.2.5 *Combined Changes and Cumulative Risk of 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. Licensees should evaluate the cumulative risk in accordance with Section 3.3.2 of Regulatory Guide 1.174 (Ref. 13).

When a licensee first adopts NFPA 805, the cumulative change in risk is the total risk from all changes made during the transition (see Regulatory Position 2.2.4). After the transition to NFPA 805, the cumulative risk of subsequent FPP changes is the change in risk compared to the post-transition

baseline risk (see Regulatory Position 2.2.4). Licensees should only include changes associated with the FPP in the cumulative risk evaluation. In the sample license condition in Regulatory Position 3.1, the NRC chose risk acceptance criteria low enough to provide reasonable assurance that the effect of self-approved changes on cumulative risk would be acceptable. However, when licensees request FPP changes that they may not self-approve after the transition to NFPA 805, their license amendment requests should address the cumulative impact of all previous FPP changes since adopting NFPA 805.

Section 2.4.4.1 of NFPA 805 further states that, if more than one plant change is combined into a group for the purposes of evaluating acceptable risk, each individual change shall be evaluated along with the evaluation of the combined change. Any risk increases may be combined with risk decreases when estimating the total risk change. Licensees should address combined changes in accordance with the guidance in Regulatory Positions 2.1.1 and 2.1.2 of Regulatory Guide 1.174.

3.3 Circuit Analysis

3.3.1 *Identifying and Evaluating Risk-Significant Circuits*

The industry guidance document NEI 00-01, Revision 1, “Guidance for Post-Fire Safe Shutdown Circuit Analysis” (Ref. 17), used in conjunction with NFPA 805 and this regulatory guide, provides one acceptable approach to circuit analysis for a plant implementing an FPP under 10 CFR 50.48(c). Where the deterministic requirements in Chapter 4 of NFPA 805 are not met for the protection of required circuits, circuit analysis assumptions regarding the number of spurious actuations, the manner in which they occur (e.g., sequentially or simultaneously), and the time between spurious actuations should be supported by engineering analysis, test results, or both that are accepted by the NRC. Aspects of circuit protection that do not conform to the deterministic requirements in Chapter 4 of NFPA 805 and were not previously approved by the NRC in accordance with Regulatory Position 2.3.2 may be evaluated using the plant change process in NFPA 805.

NEI 04-02, Section B.2.1, provides one acceptable approach for identifying and screening multiple spurious actuations when analyzing the post-fire safe-shutdown circuits. Licensees should use the plant change evaluation described in Regulatory Position 3.2.2 for unscreened spurious actuations.

The nuclear safety capability circuit analysis should address both the possible equipment damage caused by spurious actuation and the inability to restore equipment operability, including the types of failures described in the NRC’s Information Notice (IN) 92-18, “Potential for Loss of Remote Shutdown Capability During a Control Room Fire,” issued February 1992 (Ref. 18), and Regulatory Guide 1.106, Revision 1, “Thermal Overload Protection for Electric Motors on Motor-Operated Valves,” issued March 1977 (Ref. 19). The type of failure described in IN 92-18 is an example of a failure mechanism that may not have been considered during the post-fire safe-shutdown analysis. Protecting against this one type of failure does not preclude the requirement to address other possible fire-induced failure mechanisms.

3.3.2 *High/Low Pressure Interface*

Section 1.6.31 of NFPA 805 defines High-Low Pressure Interface as follows: “Reactor coolant boundary valves whose spurious opening could potentially rupture downstream piping on an interfacing system or could cause a loss of inventory that could not be mitigated in sufficient time to achieve the nuclear safety performance criteria.”

The first half of this definition is deterministic because it is based purely on the potential for rupture of downstream piping on an interfacing system. The NRC staff has determined that one acceptable approach to addressing the first half of this definition is using the guidance provided in Appendix C of NEI 00-01 regarding High/Low Pressure Interfaces.

The second half of the definition is performance-based since it involves analysis to determine whether or not a given loss of inventory could challenge the ability to meet the nuclear safety performance criteria. The analyses performed in accordance with NFPA 805, Section 4.2.4, to demonstrate the ability to meet the nuclear safety performance criteria are sufficient to address the second half of the definition. This part of the definition only applies to fire areas that are addressed using the performance-based approach since a fire area that is compliant to the deterministic rules in NFPA 805, Section 4.2.3, will not experience an inventory loss due to fire damage (at least one valve in each inventory loss pathway should be free of fire damage).

4. NFPA 805 Analytical Methods and Tools

4.1 General

NFPA 805, Section 2.7.3, has requirements for the quality of engineering analyses and associated methods that the licensee applies to demonstrate compliance with the nuclear safety and radioactive release performance criteria.

4.2 Fire Models

Licensees are required to document, in their license amendment requests, that the fire models and methods meet the NRC requirements. The NRC's Office of Nuclear Regulatory Research (RES) and the Electric Power Research Institute (EPRI) have documented the V&V process for parts of five fire models in NUREG-1824/EPRI 1011999, "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications" (Ref. 20), using ASTM E1355-05a (Ref. 9). The specific fire models documented are (1) NUREG-1805, "Fire Dynamics Tools (FDTs) (Ref. 21); (2) Fire-Induced Vulnerability Evaluation (FIVE), Revision 1 (Ref. 22); (3) the Consolidated Model of Fire Growth and Smoke Transport (CFAST) of the National Institute of Standards and Technology (NIST) (Ref. 23); (4) the Electricité de France MAGIC code (Ref. 24); and (5) the NIST Fire Dynamics Simulator (FDS), (Refs. 25 and 26). Use of these models to perform the performance-based evaluations in NFPA 805, Section 4.2.4, is acceptable to the NRC if each model used is shown to have been appropriately applied within the range of its applicability and V&V.

Licensees may also propose the use of other fire models; however, licensees are responsible for providing evidence of acceptable V&V of these fire models using the ASTM E1355-05a standard. The V&V documents for licensee-proposed fire models should be submitted with the license amendment request for NRC review. A license amendment request may use other fire models, documented in topical reports, which the NRC has previously reviewed and found acceptable, if the licensee can demonstrate that the model has been used within the range of its applicability and V&V.

Appendix C to NFPA 805 and Appendix D to NEI 04-02 contain discussions that may be useful to licensees in determining which fire models to use and applying those fire models within their limitations; however, the NRC only endorses the fire models, methodologies, data, and examples in those appendices to the extent that they have been (or can be) adequately verified and validated or to the extent that they are demonstrated appropriate for the specific application.

4.3 Fire Probabilistic Risk Assessment

The fire PRA used to perform the risk assessments of NFPA 805, Section 2.4.4 (plant change evaluation), and Section 4.2.4.2 (fire risk evaluation), must be of sufficient technical adequacy to support the application. Regulatory Guide 1.200, “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,” issued January 2007 (Ref. 27), provides applicable guidance for determining the technical adequacy of PRA models. Regulatory Guide 1.200 endorses, with certain clarifications and exceptions, industry consensus PRA standards, as available.

The NRC is in the process of updating Regulatory Guide 1.200 (Revision 2) to endorse Addendum A to the American Society of Mechanical Engineers/American Nuclear Society, “Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications” (ASME/ANS RA-Sa 2009) (“PRA Standard”) (Ref. 28), with clarifications and exceptions. The NRC position is that licensees applying fire PRA models to NFPA 805 risk assessments should use the fire PRA portion of the PRA Standard to assess the technical adequacy of their fire PRA even absent endorsement in Regulatory Guide 1.200. Before it issues Revision 2 of Regulatory Guide 1.200, the NRC staff will address any potential issues with the standard, which may ultimately become exceptions in Regulatory Guide 1.200, during its review of a licensee’s request to implement NFPA 805. A preliminary set of these issues appears in the draft guide DG-1200, issued June 2008 (Ref. 29).

An industry peer review of the fire PRA should be performed as set forth in the PRA Standard. The licensee should submit the documented high-level findings from the fire PRA peer review with the 10 CFR 50.48(c) license amendment request, including the resolution of potentially risk-significant findings. For PRA Standard “supporting requirements” important to the NFPA 805 risk assessments, the NRC position is that Capability Category II is generally acceptable. Licensees should justify use of Capability Category I for specific supporting requirements in their NFPA 805 risk assessments if they contend that it is adequate for the application. During its review of a licensee’s request to implement NFPA 805, the NRC staff may determine that some aspects of the fire PRA require Capability Category III. This will be addressed during the NRC review of the license amendment request.

The NRC and EPRI have documented a comprehensive methodology for conducting a fire PRA in NUREG/CR-6850/EPRI 1011989, “EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities” (Ref. 30). The NRC accepts the use of the fire PRA methods in this document for NFPA 805 risk assessments, including extension of any screening or scoping methods to more detailed plant-specific analyses, when warranted. Licensees should verify that the resulting fire PRA meets the PRA Standard requirements at an acceptable level of quality to support the NFPA 805 risk assessments.

In accordance with Section 2.4.3.3 of NFPA 805, the PRA approach, methods, and data must be acceptable to the NRC. Licensees should demonstrate that the methods used in meeting the NFPA 805 requirements are appropriate for each specific application. These analyses may use screening methods or more complex quantitative PRA methods, depending on the specific conditions of the scenario being evaluated. A licensee that has adopted NFPA 805 may use the PRA methods and quality requirements that the NRC approves for generic use in evaluating FPP changes in risk, without requesting plant specific approval, provided that (1) the plant-specific license condition includes this provision and (2) the NRC generic approval clearly states that the method may be applied without a plant-specific license amendment.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC's plans for using this draft regulatory guide. The NRC does not intend or approve any imposition or backfit in connection with its issuance.

The NRC has issued this draft guide to encourage public participation in its development. The NRC will consider all public comments received in development of the final guidance document. In some cases, applicants or licensees may propose an alternative or use a previously established acceptable alternative method for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with the applicable regulations for license applications, license amendment applications, and amendment requests.

REGULATORY ANALYSIS

The NRC staff did not prepare a separate regulatory analysis for this regulatory guide. The regulatory basis for this guide is the regulatory analysis prepared for the amendments to 10 CFR Part 50, "Voluntary Fire Protection Requirements for Light-Water Reactors; Adoption of NFPA 805 as a Risk-Informed, Performance-Based Alternative," dated June 16, 2004 (69 FR 33536), which examines the costs and benefits of the rule as implemented by this guide. A copy of that regulatory analysis is available for inspection and may be copied (for a fee) at the NRC's Public Document Room, located at One White Flint North, 11555 Rockville Pike, Room O1-F15, Rockville, MD.

This regulatory guide describes one acceptable approach for implementing the requirements of 10 CFR 50.48(c). That regulation sets forth the requirements governing a risk-informed fire protection program in accordance with NFPA 805. A current nuclear power plant licensee may voluntarily choose to comply with § 50.48(c) and the provisions of NFPA 805 as their approach to satisfy the requirements of § 50.48(a) and General Design Criterion 3 as an alternative to their current compliance approach and the licensee's current fire protection program. As of this date, there are no licensees who have been approved by the NRC to implement NFPA 805 under the requirements of § 50.48(c).

The regulatory guide represents a new staff position for compliance with § 50.48(c) and NFPA-805. Accordingly, the staff evaluated the regulatory guide to determine whether issuance of the regulatory guide constitutes "backfitting," as defined in 10 CFR 50.109(a)(1). The staff believes that issuance of the regulatory guide would not constitute backfitting. There are two reasons for the staff's conclusion. First, the regulatory guide provides non-binding guidance as to one acceptable way of complying with the requirements of § 50.48(c). Applicants that seek to transition to NFPA 805 are free to choose alternative approaches for complying with the requirements of § 50.48(c) and NFPA 805. Second, the regulatory guide can only apply to current and future applicants seeking approval to use NFPA 805. The Backfit Rule, 10 CFR 50.109 does not protect current or future applicants from regulatory changes (except in situations set forth in § 50.109(a)(1) which are not applicable here).

Inasmuch as the issuance of this regulatory guide does not constitute backfitting, the staff has not prepared a backfitting analysis or documented evaluation in support of the issuance of the regulatory guide.

GLOSSARY

NFPA 805, Section 1.6, contains definitions applicable to the terminology used in the standard. Regulatory Guide 1.189 also contains a substantial list of definitions of fire protection terminology applicable to nuclear power generating stations. Where potential differences or conflicts exist between definitions in NFPA 805 and other fire protection regulatory documents, and where these definitions are important to the licensing basis, the licensee's documentation should clearly identify the definition that is being applied.

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2. NFPA 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants," 2001 Edition, National Fire Protection Association, Quincy, MA.
3. 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, DC.
4. 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," U.S. Nuclear Regulatory Commission, Washington, DC.
5. 69 FR 33536, "Voluntary Fire Protection Requirements for Light Water Reactors; Adoption of NFPA 805 as a Risk-Informed, Performance-Based Alternative," *Federal Register*, Volume 69, Number 115, pp. 33536–33550, Washington, DC, June 16, 2004.
6. NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Revision 2, Nuclear Energy Institute, Washington, DC, April 2008 (ADAMS Accession No. ML081130174)
7. SECY-98-058, "Development of a Risk-Informed, Performance-Based Regulation for Fire Protection at Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, DC, March 26, 1998. (ADAMS Accession No. ML003753120)
8. SECY-00-0009, "Rulemaking Plan, Reactor Fire Protection Risk-Informed, Performance-Based Rulemaking," U.S. Nuclear Regulatory Commission, Washington, DC, January 13, 2000. (ADAMS Accession No. ML003671923)
9. ASTM E1355-05a, "Standard Guide for Evaluating the Predictive Capability of Deterministic Fire Models," American Society for Testing and Materials, West Conshohocken, PA, 2005.
10. 10 CFR, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, DC.
11. 10 CFR 50.54, "Conditions of Licenses," U.S. Nuclear Regulatory Commission, Washington, DC.
12. 10 CFR, Part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," U.S. Nuclear Regulatory Commission, Washington, DC.
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14. GL 86-10, "Implementation of Fire Protection Requirements," U.S. Nuclear Regulatory Commission, Washington, DC, April 24, 1986, available electronically through the NRC's public Web site, at <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/gen-letters/1986/gl86010.html>.

15. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 9.5.1, "Fire Protection Program," Revision 5, U.S. Nuclear Regulatory Commission, Washington, DC, March 2007(ADAMS Accession No. ML063190014)
16. Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants," Revision 1, U.S. Nuclear Regulatory Commission, Washington, DC, March 2007. (ADAMS Accession No. ML070370183)
17. NEI 00-01, "Guidance for Post-Fire Safe-Shutdown Circuit Analysis," Revision 1, Nuclear Energy Institute, Washington, DC, January 2005 (ADAMS Accession No. ML050310295)
18. Information Notice IN 92-18, "Potential for Loss of Remote Shutdown Capability During a Control Room Fire," U.S. Nuclear Regulatory Commission, Washington, DC, February 1992, available electronically through the NRC's public Web site, at <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1992/in92018.html>.
19. Regulatory Guide 1.106, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves," Revision 1, U.S. Nuclear Regulatory Commission, Washington, DC, March 1977 (ADAMS Accession No. ML003740323)
20. NUREG-1824/EPRI 1011999, "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications – Final Report," U.S. Nuclear Regulatory Commission, Washington, DC, May 2007. (ADAMS Accession No. ML071650546)
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30. NUREG/CR-6850/EPRI 1011989, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," Volume 1: Summary and Overview, Volume 2: Detailed Methodology, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC, September 2005. (ADAMS Accession No. ML052580118, ML052580075)