

March 4, 2008

MEMORANDUM TO: AFPB File

FROM: Alex Klein, Chief */RA/*
Fire Protection Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

SUBJECT: CLOSE-OUT OF NATIONAL FIRE PROTECTION ASSOCIATION
STANDARD 805 (NFPA 805) FREQUENTLY ASKED QUESTION (FAQ)
06-0011, III.G.3 TRANSITION

The NRC staff has reviewed FAQ 06-0011, Revision 2. FAQ 06-0011, Revision 2 was proposed by the transition team at the D. C. Cook nuclear plant (the authors) to provide guidance on how to transition those fire areas where potential fire damage dictates the use of either an Alternative Shutdown strategy or a Dedicated Shutdown strategy in accordance with Title 10 of the Code of Federal Regulations (CFR) Part 50 (10 CFR 50) Appendix R, Section III.G.3 (or Regulatory Position C.5.b.(3) of Branch Technical Position CMEB 9.5-1, "Fire Protection Program" of NUREG-0800, Revision 3). These fire areas will hereafter be referred to as "III.G.3 fire areas".

Industry Proposal

The authors of FAQ 06-0011, revision 2 are proposing that the following items be included in the industry document developed to provide guidance to perform the NFPA 805 transition process, Nuclear Energy Institute document NEI 04-02, "Guidance for Implementing a Performance-Based, Risk-Informed Fire Protection Program Under 10 CFR 50.48(c)" (NEI 04-02) (The NRC staff has summarized the authors proposal using the following 6 bullets):

1. III.G.3 fire areas will be transitioned using the performance-based approach in accordance with NFPA 805 Section 4.2.4, "Performance-Based Approach," using as success criteria the nuclear safety goals, objectives and performance criteria in NPFA 805 Chapter 1.
2. Deterministic methods may be used to simplify the transition of III.G.3 fire areas.
3. The risk associated with the use of recovery actions will be evaluated in accordance with NFPA 805 Section 4.2.4, "Performance-Based Approach." Deterministic methods used to simplify the transition can not be used to avoid evaluation of recovery action risk.
4. For a fire area that is fully compliant to the existing deterministic III.G.3 regulations a plant change evaluation would not be required.

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5. A fire area that is fully compliant to the existing deterministic III.G.3 regulations is “deemed to satisfy” the defense-in-depth and safety margin requirements.
6. If no changes are made to the compliance strategy for a fully compliant III.G.3 fire area, no uncertainty analysis would be required per *10 CFR 50.48(c)(2)(iv)*.

NRC Staff Evaluation

The NRC staff (the staff) has evaluated the FAQ 06-0011, Revision 2 proposals with respect to regulatory compliance and technical adequacy.

The authors propose in Item 1 that transition of III.G.3 fire areas use the NFPA 805 performance-based approach. The staff position is that use of the performance-based approach is required for two reasons. First, the deterministic requirements of NFPA 805 as presented in Section 4.2.3 do not include alternative or dedicated shutdown strategies. III.G.3 fire areas, by definition, are those where protection of systems whose function is required for hot shutdown does not satisfy the requirements of sections III.G.1 or III.G.2. This results in the inability to utilize the deterministic approach for III.G.3 fire areas.

Second, alternative or dedicated shutdown strategies require the use of operator manual actions outside the Main Control Room (MCR) to operate safe shutdown equipment. These operator manual actions outside the MCR are considered “recovery actions” within the context of NFPA 805. NFPA 805 Section 4.2.3.1 states “Use of recovery actions to demonstrate availability of a success path for the nuclear safety performance criteria automatically shall imply the use of the performance-based approach outlined in 4.2.4.” Since alternative or dedicated shutdown strategies require the use of recovery actions, NFPA 805 requires the performance-based approach to be used.

NFPA 805 Section 2.4.2 requires that the methodology for performing a Nuclear Safety Capability Assessment utilize the nuclear safety performance criteria in NFPA 805 Chapter 1 as the success criteria for the analysis. The proposal to utilize the nuclear safety goals, objectives and performance criteria in NFPA 805 Chapter 1 is consistent with these requirements.

The staff found that Item 1 is consistent with NFPA 805 requirements and is therefore acceptable.

The authors propose in Item 2 that transition of III.G.3 fire areas using the performance-based approach may use deterministic methods to simplify the analysis. The use of deterministic methods while using the performance-based approach has been addressed in NFPA 805. NFPA 805 Section 4.2.2 states: “The performance-based approach shall be permitted to utilize deterministic methods for simplifying assumptions within the fire area.”

The staff found that Item 2 is also consistent with NFPA 805 requirements and is therefore acceptable.

The authors propose in Item 3 that the risk associated with the use of recovery actions will be evaluated in accordance with NFPA 805 Section 4.2.4, “Performance-Based Approach.”

The authors also propose, based on the wording in the FAQ, that deterministic methods used to simplify the transition can not be used to avoid evaluation of recovery action risk (the FAQ clearly states that recovery action risk must be evaluated with no qualifiers regarding deterministic methods). The staff found that proposal 3 is consistent with NFPA 805 and is therefore acceptable.

The authors propose in Item 4 that a plant change evaluation would not be required for a fire area that is fully compliant to the existing III.G.3 deterministic regulations. NFPA 805 sections 2.2.9 and 2.4.4 state that a plant change evaluation is required when there is a change to a previously approved fire protection program element. If a fire area is currently compliant with the deterministic requirements of the existing licensing basis, for the purposes of NFPA 805 transition, it is considered previously approved. A plant change evaluation would only be needed if some aspect of the compliance to the existing deterministic rules was not acceptable.

NFPA 805 does require the licensee to perform sufficient engineering analyses to demonstrate that the nuclear safety performance criteria are met for the fire area. NFPA 805 also requires that the risk associated with the use of recovery actions must be evaluated.

The staff found that if a fire area is fully compliant to the appropriate alternative or dedicated shutdown requirements, a plant change evaluation would not be required. The staff also found that the requirement to demonstrate the ability to meet the nuclear safety performance criteria and to evaluate the risk associated with recovery actions adds confidence that the fully compliant area provides sufficient protection to the public health and safety. The NRC staff therefore finds Item 4 acceptable.

The authors propose in Item 5 that a fire area that is fully compliant to the existing deterministic III.G.3 regulations is “deemed to satisfy” the defense-in-depth and safety margin requirements. NFPA 805 Section 4.1 states that “Deterministic requirements shall be “deemed to satisfy” the performance criteria and require no further engineering analysis. If a fire area is currently compliant with the deterministic requirements of the existing licensing basis, for the purposes of NFPA 805 transition, it is considered previously approved. By meeting the existing deterministic requirements, it is “deemed to satisfy” the defense-in-depth and safety margin requirements in NFPA 805.

The staff found that based on the fact that a fire area was deemed to be compliant to the existing deterministic requirements, it is considered previously approved and therefore, “deemed to satisfy” the defense-in-depth and safety margin requirement in NFPA 805. The NRC staff therefore finds Item 5 acceptable.

The authors propose in Item 6 that if no changes are made to the compliance strategy for a fire area that is fully compliant to III.G.3, no uncertainty analysis would be required per *10 CFR 50.48(c)(2)(iv)*.

If a fire area is currently compliant with the deterministic requirements of the existing licensing basis, for the purposes of NFPA 805 transition, it is considered previously approved. The method of compliance under the existing licensing basis is deterministic. Based on the

exception taken to NFPA 805 in *10 CFR 50.48(c)(2)(iv)*, the licensee does not need to perform an uncertainty analysis since the previously approved configuration meets the existing deterministic requirements.

The staff found that based on the fact that a fire area was deemed to be compliant to the existing deterministic requirements, it is considered previously approved. Since the previously approved methodology is deterministic, the exception taken to NFPA 805 in *10 CFR 50.48(c)(2)(iv)* applies and no uncertainty analysis would be required. The NRC staff therefore found Item 6 to be acceptable.

The staff has reviewed the proposed changes to NEI 04-02 as presented in FAQ 06-0011, Revision 2 and finds that nothing in this FAQ would prevent continued endorsement of NEI 04-02. In accordance with RIS 2007-19, the guidance in this FAQ is acceptable for use by licensees in transition. The final endorsement of this FAQ will be addressed by the next revision to Regulatory Guide 1.205.

See the enclosure to this memorandum for a chronological history of this FAQ.

References:

For details regarding this FAQ, please see the following:

- FAQ 06-0011, Revision 0 (09/28/06) (ADAMS accession number ML062890271)
- NRC Staff Response to FAQ 06-0011, Revision 0, (11/28/2006) (ADAMS accession number ML063350442)
- FAQ 06-0011, Revision 1 (02/15/07) (ADAMS accession number ML070510505)
- NRC Staff Response to FAQ 06-0011, Revision 1 (08/22/07) (ADAMS accession number ML07240024)
- FAQ 06-0011, Revision 2 (09/20/07) (ADAMS accession number ML072740248)
- NEI 04-02, Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c), Revision 1, (ADAMS accession number ML052590476)
- NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition (available through the Public Document Room or NFPA)
- Regulatory Guide 1.205, Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants (ADAMS accession number ML061100174)
- NRC Regulatory Information 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 (ADAMS accession number ML071590227)

exception taken to NFPA 805 in *10 CFR 50.48(c)(2)(iv)*, the licensee does not need to perform an uncertainty analysis since the previously approved configuration meets the existing deterministic requirements.

The staff found that based on the fact that a fire area was deemed to be compliant to the existing deterministic requirements, it is considered previously approved. Since the previously approved methodology is deterministic, the exception taken to NFPA 805 in *10 CFR 50.48(c)(2)(iv)* applies and no uncertainty analysis would be required. The NRC staff therefore found Item 6 to be acceptable.

The staff has reviewed the proposed changes to NEI 04-02 as presented in FAQ 06-0011, Revision 2 and finds that nothing in this FAQ would prevent continued endorsement of NEI 04-02. In accordance with RIS 2007-19, the guidance in this FAQ is acceptable for use by licensees in transition. The final endorsement of this FAQ will be addressed by the next revision to Regulatory Guide 1.205.

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- NRC Regulatory Information 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 (ADAMS accession number ML071590227)

Enclosure:
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ADAMS Accession Number: ML080300121

NRR-106

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FAQ 06-0011 History

INITIAL FAQ 06-0011 PROPOSAL

The NFWA 805 Transition Team at the D. C. Cook nuclear plant initiated FAQ 06-0011 and processed it through the Nuclear Energy Institute's NFWA 805 Task Force in order to provide additional guidance to licensees regarding transition of those fire areas that currently credit post-fire safe shutdown in accordance with *10 CFR 50 Appendix R, Section III.G.3 and III.L.* FAQ 06-0011, Revision 0 proposed to revise Section B.2.2 of NEI 04-02 to address use of the deterministic approach for fire areas that currently credit Appendix R Section III.G.3 and III.G.L. FAQ 06-0011, Revision 0 cited the flow chart presented in Figure 2.2 of NFWA 805, indicating that deterministic compliance was allowed by the standard. Revision 0 also stated that "...Figure 2.2 of NFWA 805 recognizes the new fire protection licensing basis may include components of the existing plant Fire Protection Program (including approved exemptions/deviations and correctly implemented 10 CFR 50.59 and Fire Protection Regulatory reviews) that can be shown to comply with Chapters 1, 2 and 4. This would be considered compliance with deterministic compliance in NFWA 805 Chapter 4. Otherwise additional Fire Protection Regulatory reviews may be used to demonstrate compliance."

FAQ 06-0011, Revision 0 also pointed out that Regulatory Guide 1.205, Section 2.3 states: "Section 2.2.7 of NFWA 805 describes the application of existing engineering equivalency evaluations (EEEs) when using a deterministic approach during the transition to an NFWA 805 FPP."

NRC STAFF RESPONSE TO FAQ 06-0011, REVISION 0

The NRC staff responded with a comment that alternative and/or dedicated shutdown strategies must transition utilizing a performance-based approach.

The staff stated that fire areas that previously demonstrated compliance to the deterministic rules using alternative/dedicated shutdown strategies would be acceptable as the base-line compliance strategy for the risk-informed, performance-based FPP under NFWA 805. However, inspection of fire areas that credited alternative/dedicated shutdown strategies would utilize the deterministic criteria of Section III.G.3 [detection and suppression] and the success criteria of Section III.L [pressurizer level for Pressurized Water Reactors (PWRs) and Top of Active Fuel (TAF) for Boiling Water Reactors (BWRs)].

The staff also pointed out that licensees transitioning to a performance-based FPP should verify that any recovery actions credited for Chapter 4 compliance are both feasible and reliable. Reliability may be demonstrated using a screening approach.

FAQ 06-0011, REVISION 1

The transition team at D. C. Cook revised the FAQ to state that a combination of performance-based and deterministic approaches should be used to transition alternative/dedicated shutdown strategies. Revision 1 states that deterministic methods can be

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utilized under the performance-based approach as identified in Sections 2.2.e and 4.2.2 of NFPA 805. Revision 1 also states that if no changes are made to the compliance strategy, a risk-informed, performance-based change evaluation is not required since meeting the deterministic requirements has been “deemed to satisfy” both “Defense-in-Depth” and “Safety Margin” requirements. In addition, Revision 1 proposed that if no changes had been made to the compliance strategy, no uncertainty analysis would be necessary.

NRC STAFF RESPONSE TO FAQ 06-0011, REVISION 1

The NRC staff responded by providing a draft revision 2 of the FAQ that stated that the transition of alternative/dedicated shutdown areas should be addressed using the performance-based approach, that deterministic methods could be used to simplify the analysis, that the risk associated with recovery actions should be evaluated, and that the success criteria to be used for these areas should be Section 1 of NFPA 805.

The draft FAQ acknowledged that licensees previously were required to demonstrate that the plant response to a potential fire in an area that credited alternate/dedicated shutdown would meet the performance criteria set in Section III.L of Appendix R. Those same thermal-hydraulic analyses should be adequate to demonstrate compliance to the performance goals, objectives and criteria provided in Section 1 of NFPA 805.

The draft FAQ also stated that exemptions and properly implemented FPP changes must be reviewed to verify that the quality level is acceptable and the basis for acceptability is still valid.

FAQ 06-0011, REVISION 2

The transition team at D. C. Cook incorporated the proposed wording provided by the staff.

The authors addressed all the NRC staff’s comments.