

From: "JAMAR, Brandon" <btj@nei.org>
To: "Charles Moulton" <CEM4@nrc.gov>
Date: Thu, Jul 12, 2007 12:27 PM
Subject: FAQs for submittal - 7/12/07

Chuck,

The following FAQs are attached for NRC submittal: FAQ 07-0032, Rev. 0 and 07-0033, Rev. 0. Please let me know if you have any questions or problems with this transmittal.

Thank you,

Brandon Jamar

NEI

btj@nei.org <mailto:btj@nei.org>

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CC: "Sunil Weerakkody" <SDW1@nrc.gov>, "Paul Lain" <PWL@nrc.gov>

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Subject: FAQs for submittal - 7/12/07
Creation Date 7/12/2007 12:26:35 PM
From: "JAMAR, Brandon" <btj@nei.org>

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Recipients

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TWGWPO01.HQGWDO01
CEM4 (Charles Moulton)
PWL CC (Paul Lain)

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FAQ 07-0033 R0.pdf	31912	
Mime.822	97711	

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Expiration Date: None
Priority: Standard
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Return Notification: None

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Attachment 1:

FAQ Number 07-0032

FAQ Revision 0

FAQ Title Clarification of 10 CFR 50.48(c), 50.48(a), and GDC 3

Plant: Harris

Date: May 16, 2007

Contact: Alan Holder

Phone: 919.546.3372

Email: Alan.Holder@pgnmail.com

Distribution: *(NEI Internal Use)*

☒ 805 TF ☐ FPWG ☐ RATF ☐ RIRWG ☐ BWROG ☐ PWROG

Purpose of FAQ:

The purpose of this FAQ is to clarify that satisfying 10 CFR 50.48(c) will satisfy 10 CFR 50.48(a) and GDC3.

Is this Interpretation of guidance? Yes / ☐ No

Proposed new guidance not in NEI 04-02? ☐ Yes / No

Details:

NEI 04-02 guidance needing interpretation (include section, paragraph, and line numbers as applicable):

During the Pilot Observation meetings discussions have been held regarding how requirements for 10 CFR 50.48(a) and GDC 3 are met by implementing NFPA 805 (10 CFR 50.48(c)). Specifically:

- 10 CFR 50.48(a) uses the terms “limit fire damage to structures, systems, or components important to safety so that the capability to shut down the plant safely is ensured”
- GDC 3 uses the terms “Structures, systems, and components important to safety”.
- 10 CFR 50.48(c) uses the term “Important to Nuclear Safety”

NEI 04-02 contains an overview of the 10 CFR 50.48 (c) in Section 2.1 but does not clearly explain how meeting 10 CFR 50.48(c) satisfies 10 CFR 50.48(a) and GDC 3. This guidance needs to be provided to ensure that it is clearly understood that post-transition fire protection systems, features and components are required to meet the ‘nuclear safety performance criteria’.

Circumstances requiring guidance interpretation or new guidance:

The request to clarify how transitioning to a 10 CFR 50.48 (c) licensing basis satisfies 10 CFR 50.48 (a) and General Design Criteria 3 has been requested by the Transitioning Plants.

Detail contentious points if licensee and NRC have not reached consensus on the facts and circumstances:

None.

Potentially relevant existing FAQ numbers:

Response Section:**Proposed resolution of FAQ and the basis for the proposal:**

Federal Register Notice 69 FR 33536 provides the necessary clarification. This information should be included in Section 2.2.2 of NEI 04-02 and in Appendix H (LAR submittal).

If appropriate, provide proposed rewording of guidance for inclusion in the next Revision:

See attached:

2.2.2 Relationship to Other Fire Protection Requirements

NFPA 805 is codified as 10 CFR 50.48(c). The new rule was placed deliberately in this location to show how it relates to existing fire protection requirements. The new rule establishes alternative requirements that a licensee may voluntarily adopt instead of continuing to comply with its current fire protection licensing basis. A fire protection program that complies with 10 CFR 50.48 (c), NFPA 805, as adopted by the NRC, is an acceptable alternative to compliance with either 10 CFR 50.48(b) (for plants licensed to operate before January 1, 1979 “Appendix R Plants”), or existing plant fire protection license conditions (10 CFR 50.48(c)(3)(i)) for plants licensed to operate after January 1, 1979 (Post-Appendix R Plants). For plants that have shut down and submitted the certifications required by 10 CFR 50.82(a)(1), compliance with NFPA 805 may be adopted as an acceptable method for complying with 10 CFR 50.48(f).

2.2.3 ~~Alternative Requirements in the New Rule~~

The new rule does not supersede the requirements of GDC 3 or 10 CFR 50.48(a). The new rule provides actions that may be taken to establish compliance with 10 CFR 50.48(a), which requires each operating nuclear power plant to have a fire protection program plan that satisfies General Design Criterion 3 (GDC 3), as well as specific requirements in that section. The NRC in 69 FR 33536 provides the following clarification:

“NFPA 805 does not supersede the requirements of GDC 3, 10 CFR 50.48(a), or 10 CFR 50.48(f). Those regulatory requirements continue to apply to licensees that adopt NFPA 805. However, under NFPA 805, the means by which GDC 3 or 10 CFR 50.48(a) requirements may be met is different than under 10 CFR 50.48(b). Specifically, whereas GDC 3 refers to SSCs important to safety, NFPA 805 identifies fire protection systems and features required to meet the Chapter 1 performance criteria through the methodology in Chapter 4 of NFPA 805. Also, under NFPA 805, the 10 CFR 50.48(a)(2)(iii) requirement to limit fire damage to SSCs important to safety so that the capability to safely shut down the plant is ensured is satisfied by meeting the performance criteria in Section 1.5.1 of NFPA 805. The Section 1.5.1 criteria include provisions for ensuring that reactivity control, inventory and pressure control, decay heat removal, vital auxiliaries, and process monitoring are achieved and maintained.

This methodology specifies a process to identify the fire protection systems and features required to achieve the nuclear safety performance criteria in Section 1.5 of NFPA 805. Once a determination has been made that a fire protection system or feature is required to achieve the performance criteria of Section 1.5, its design and must meet any applicable requirements of NFPA 805, Chapter 3. Having identified the required fire protection systems and features, the licensee selects either a deterministic or performance-based approach to demonstrate that the performance criteria are satisfied. This process satisfies the GDC 3 requirement to design and locate SSCs important to safety to minimize the probability and effects of fires and explosions.”

The transition process described in 10 CFR 50.48(c)(3)(ii) provides, in pertinent parts, that a licensee intending to adopt the new rule must, among other things, “modify the fire protection

Markup of NEI 04-02 Revision 1

plan required by paragraph (a) of that section to reflect the licensee's decision to comply with NFPA 805." Therefore, to the extent that the contents of the existing fire protection program plan required by 10 CFR 50.48(a) are inconsistent with NFPA 805, the fire protection program plan must be modified to achieve compliance with the requirements in NFPA 805.

A comparison of the current requirements in Appendix R with the comparable requirements in Section 3 of NFPA 805 shows that the two sets of requirements are consistent in many respects. However, there are differences. Among them are the elimination of specific requirements for: (1) emergency lighting; (2) an alternative shutdown capability; and (3) cold shutdown. These topics are addressed in the transition of the nuclear safety performance criteria (Appendix B-2).

H.2 Template: License Amendment Request to Authorize Adoption of NFPA 805 with Optional Provision for Alternative Methods and Analytical Approaches

[Date]

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Subject: **[Facility Name]**
[Facility Docket numbers]
License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants, 2001 Edition)

Pursuant to Title, Code of Federal Regulations (CFR), Part 50, Section 90 (10 CFR 50.90), **[Facility Name]** proposes to amend Appendix A, Technical Specifications (Tech Specs), for Facility Operating Licenses **[License Numbers]** for **[Facility Name]**. **[Identify the Technical Specifications that need to be amended (including changes to the bases).]** This amendment is needed to support the adoption of NFPA 805 Performance-Based Standard for Fire Protection, 2001 Edition in accordance with 10 CFR 50.48(c) [as a method of satisfying 10 CFR 50.48\(a\) and General Design Criterion 3](#). The proposed License Amendment Request (LAR) revises the licensing basis associated with the Fire Protection Program.

The following process was used to determine that these are the only Technical Specifications that require amendment. **[Describe the process.]**

In addition, **[Facility Name]** also requests that the license be amended to remove the following superseded license conditions **[identify license conditions to be superseded]** and replace them with the following suggested license condition authorizing the use of NFPA 805. The following process was used to identify all of the license conditions that require removal.

[Describe the process used to ensure completeness of the set of license conditions that require removal.]

As a separate but related matter, **[Facility Name]** has identified the following unnecessary or superseded orders and exemptions that are required to be revoked. **[Identify orders and exemptions]**. The following process was conducted to identify all of the orders and exemptions that are required to be revoked. **[Describe the process used to ensure completeness of the set of orders and exemptions that are required to be revoked.]**

[Optional provisions for alternative methods and analytical approaches.] Alternative methods and analytical approaches have been used to demonstrate compliance with certain requirements in NFPA 805. The following table lists those requirements and the alternative

Markup of NEI 04-02 Revision 1

method and analytical approach applied to each. A detailed analyses demonstrating how an alternative method and analytical approach demonstrates compliance for each such requirement is provided in the attachments.

Implementation of this amendment to the **[Facility Name]** operating license and Tech Specs will impact the **[Facility Name]** UFSAR. As a result of implementing this LAR, it will be necessary to revise various sections of the **[Facility Name]** UFSAR. Necessary changes will be made in accordance with 10 CFR 50.71(e).

Plant modifications are/are not necessary to support the adoption of NFPA 805.

- [For the modifications anticipated, provide a brief description of the modifications].

[Facility Name] plans to implement this/these modification(s) by the dates shown in the following updated transition schedule. **[Insert update of schedule provided in letter of intent]** Approval of this proposed LAR is requested by **[month, day, year]** to support this transition schedule.

Implementation of these changes will not result in an undue risk to the health and safety of the public.

Attachments:

Detailed Analyses of Compliance Using Alternative Methods and Analytical Approaches
No Significant Hazards Consideration
Environmental Impact Assessment

Attachment 2:

FAQ Number 07-0033

FAQ Revision 0

FAQ Title Engineering Analyses

Plant: Harris

Date: 6/14/07

Contact: Alan Holder

Phone: 919-546-3372

Email: alan.holder@pgnmail.com

Distribution: (NEI Internal Use)

☒ 805 TF ☐ FPWG ☐ RATF ☐ RIRWG ☐ BWROG ☐ PWROG

Purpose of FAQ:

Provide guidance on the transition of existing engineering equivalency evaluations.

Is this Interpretation of guidance? ☒ Yes / No

Proposed new guidance not in NEI 04-02? ☒ Yes / No

Details:

NEI 04-02 guidance needing interpretation (include section, paragraph, and line numbers as applicable):

Sections 4.3.1, 4.3.2, Appendix B

Circumstances requiring guidance interpretation or new guidance:

NEI 04-02 (Reference 2.4) Section 4.1.1 states in part:

“The extent to which the pre-transitional fire protection licensing basis can be incorporated into the new NFPA 805 licensing basis is determined by the extent to which the fire protection CLB can be shown to comply with the requirements in NFPA 805. However, exceptions are permitted for the following licensee specific deviations from NFPA 805 requirements:

- *Alternatives from the fundamental fire protection program attributes of NFPA 805 Chapter 3 [NFPA 805 Chapter 3 Section 3.1] previously reviewed and approved by the NRC.*
- *Exemptions/deviations from 10 CFR 50 Appendix R / NUREG 0800 [NFPA 805 Figure 2.2] previously reviewed and approved by the NRC. Note the licensee will review these exemptions/deviations during the transition process to ensure the basis for acceptability is still valid.*
- *Existing Engineering Equivalency Evaluations [NFPA 805 Figure 2.2]. Note the licensee will review these equivalency evaluations during the transition process to ensure the quality level and the basis for acceptability is still valid.”*

NEI 04-02 (Reference 2.4) Section 4.3.1 states:

“It is important that the “previously approved alternatives” be clearly determined in order to understand the level of review and potential upgrades necessary to meet the requirements in Chapter 3 of NFPA 805. Fire protection program features and systems, although previously reviewed and approved by the NRC, may have been changed since initial NRC approval. Such changes are part of the Current Licensing Basis (CLB) if they have been made in accordance with the correct application of the guidelines of Generic Letter 86-10, an evaluation of plant changes under the requirements of 10 CFR 50.59, or the fire protection standard license condition (NEI 02-03). The fire protection standard license condition allows changes to the “approved fire protection program without prior approval of the Commission if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.” Where the changes from the original NRC review and approval have been made appropriately using an approved change process, the changes are considered an acceptable part of the CLB. Licensees may rely on these changes to claim compliance but the NRC may inspect those changes and conclude that they do not comply with NFPA 805. However, they are not considered previously approved by the NRC for the purposes of superseding requirements in Chapter 3.”

Guidance needs to be provided to document the criteria against which the existing engineering equivalency evaluations will be reviewed.

Detail contentious points if licensee and NRC have not reached consensus on the facts and circumstances:

N/A

Potentially relevant existing FAQ numbers:

FAQ 06-0008 provides a process for post-transition engineering analyses.

Response Section:

Proposed resolution of FAQ and the basis for the proposal:

Engineering evaluations that have been made in accordance with an appropriate application of the guidelines of Generic Letter 86-10, and evaluated under the requirements of 10 CFR 50.59, or the fire protection standard license condition (Fire Protection Program Regulatory Reviews), are acceptable for transition to the new fire protection licensing basis. These engineering evaluations are not considered a “change” for the purposes of a transition change evaluation. These evaluations may be associated with fire protection systems and features addressed in NFPA 805, Chapter 3.

If appropriate, provide proposed rewording of guidance for inclusion in the next Revision:

Section 4.3.1 of NEI 04-02, Revision 1, last sentence (page 27). Insert underlined information.

Guidance on performing and documenting the fundamental element review is provided in Appendix B-1 of this document. A sample table showing NFPA 805 requirements, fundamental program and design elements, items for review, method of compliance, and licensing basis references are also shown in Appendix B.1 of this document. [Guidance on determining the acceptability of existing engineering equivalency evaluations is provided in Appendix B.3 of this document.](#)

Section 4.3.2 of NEI 04-02, Revision 1, last sentence (page 29). Insert underlined information.

Where the licensing basis is unclear or silent on fire area compliances, care should be taken to establish a licensing basis going forward. Guidance on performing and documenting the NFPA 805 Chapter 4 reviews is provided in the tables in Appendix B.2 of this guidance. [Guidance on determining the acceptability of existing engineering equivalency evaluations is provided in Appendix B.3 of this document.](#)

Insert new section B.3 to Appendix B of NEI 04-02:

B.3 Existing Engineering Equivalency Evaluations – Acceptability Determination

For the purposes of this transition, Engineering Equivalency Evaluations are those evaluations that demonstrate a fire protection system or feature is adequate for the hazard. In other words, the feature /system cannot be evaluated as ‘rated’ or ‘compliant’. For example a penetration seal engineering equivalency evaluation that determines the seal is ‘rated’ would not be included in the EEEE review of this procedure. However, if the evaluation takes into consideration combustible loading, other suppression/detection features, location of safe shutdown equipment, etc., and makes a claim that the seal is ‘adequate for the hazard’ then this evaluation would be considered in the scope of this instruction.

NEI 02-03, Appendix A, provides guidance for the preparation and development of engineering evaluations to determine if changes result in a deviations from applicable regulatory requirements, guidance documents, or the fire protection licensing basis are acceptable. The guidance may also be utilized to evaluate deviations from applicable NFPA codes. The guidance in NEI 02-03 is consistent with the information contained in Generic Letter 86-10. The evaluation criteria and considerations in Appendix A to NEI 02-03 should be utilized in the decision-making process regarding the adequacy of engineering evaluations for transition. These

FAQ Title Engineering Analyses

criteria and considerations should also be utilized in upgrading engineering evaluations or performing additional engineering evaluations prior to transition.

The following process should be used to determine if an existing engineering equivalency is adequate to transition:

- The engineering evaluation should not be based solely on quantitative risk evaluations.
- The engineering evaluation should be qualitative, and avoid performance based justifications.
- The engineering evaluation should be an appropriate use of the engineering evaluation process (e.g., for a pre-1979 plant, judging that 15 feet of separation between redundant trains with suppression and detection meets 10 CFR 50, Appendix R, Section III.G.2.b is not appropriate, since an exemption would be required.)
- The engineering evaluation has been evaluated against the criteria in the pre-transition standard fire protection license condition, 10 CFR 50.59, or plant specific process used to determine the impact of the change/condition on the ability to achieve and maintain post-fire safe shutdown.
- The engineering evaluations should be judged to be of acceptable quality. A recommended quality standard for engineering evaluations is based upon ASME NQA-1. ASME NQA-1 requires that design analyses meet minimum requirements. Design analyses shall be:
 - Legible and in a form suitable for reproduction, filing, and retrieving.
 - Provide analysis sufficiently detailed as to purpose, method, assumptions, design input, references and units, such that a person technically qualified in the subject can review and understand the analysis and verify the adequacy of the results without recourse to the originator.
 - ASME NQA-1 applies these requirements to safety-related and augmented quality design analyses. Fire Protection is typically "augmented quality", so engineering evaluations would be subject to these requirements.
- The engineering evaluation should reflect the current plant configuration or clearly bound changing plant conditions.

The engineering evaluation results will require judgment. The results of the transition evaluation should be formally documented as part of the transition report. This documentation should consist of a listing of each evaluation (document reference, revision no., related fire areas, etc.) and the results of the adequacy review. Existing engineering evaluations that will be transitioned to the new licensing basis and are determined to be inadequate can be:

- Updated to an acceptable level before transition and transitioned over to the new licensing basis.
- Evaluated during the transition process as part of the change evaluation process. (Note: Depending upon the significance of the adequacy determination, the item under consideration may need to be addressed via the corrective action process and/or may require compensatory measures.)

Chuck,

Does the NRC have anything planned for either closure or comments to FAQs for tomorrow's meeting? Any advance notice, or material would be greatly appreciated.

Thanks!

Brandon

Brandon T. Jamar

Project Manager, Engineering

Nuclear Energy Institute

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Creation Date 7/18/2007 1:39:17 PM
From: "JAMAR, Brandon" <btj@nei.org>

Created By: btj@nei.org

Recipients

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Expiration Date: None
Priority: Standard
ReplyRequested: No
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Junk Mail settings when this message was delivered

Junk Mail handling disabled by User
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Block List is not enabled

Brandon,

I expect to have the Office of Research report on FAQ 22 ready, and expect a decision on closure of FAQ 25 by COB. I have a meeting this afternoon to sort some of this out and will send an e-mail update as soon as I know more.

Chuck

>>> "JAMAR, Brandon" <btj@nei.org> 7/18/2007 1:39 PM >>>
Chuck,

Does the NRC have anything planned for either closure or comments to FAQs for tomorrow's meeting? Any advance notice, or material would be greatly appreciated.

Thanks!

Brandon

Brandon T. Jamar

Project Manager, Engineering

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From: Charles Moulton

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nrc.gov TWGWPO04.HQGWDO01 1:45:15 PM SDW1 CC (Sunil Weerakkody) 7:59:56 AM	Delivered	7/18/2007
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Security:

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Brandon,

Here is the staff's comment on FAQ 22, as well as two other handouts for today's meeting. please distribute them to the Task Force. We are finalizing comments on FAQ 8, and I will send that along as soon as I have it. We also plan on closing FAQ 25.

Thanks,

Chuck

Charles Moulton
Fire Protection Engineer
NRR/DRA/AFPB
Phone: 415-2751
Mailstop: O11A11

>>> "JAMAR, Brandon" <btj@nei.org> 7/18/2007 1:39 PM >>>
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Thanks!

Brandon

Brandon T. Jamar

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Attachment 1:

FAQ 06-0022

The proposed FAQ concerns the acceptability of electrical cable fire tests to the NRC.

- Attached is a report from the NRC's Office of Research concerning cable fire propagation tests.

The staff's comment is as follows:

Modify the FAQ to bring it in line with the attached report, noting particularly, the report's test-based methodology as opposed to the standard-based methodology of the original revision of the FAQ.

Response to NRR FAQ 06-0022
Guidance on Standards and Flame Propagation Tests

Prepared by:
Felix E. Gonzalez and Jason Dreisbach
US NRC RES Fire Research Branch
June 21, 2007

Prepared for:
US NRC NRR Fire Protection Branch

Response to NRR FAQ 06-0022

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Low Intensity Test Methods.....	10
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Purpose

The purpose of this report is to provide a response to your question concerning flame propagation (spread) tests for electrical cables. This report will evaluate current flame propagation tests to the IEEE 383-1974 Standard. This standard was selected as the baseline since it has been previously referenced as the US NRC minimum test standard and acceptance criteria for cable flame propagation tests.

References

US Nuclear Regulatory Commission Documents

1. Regulatory Guide 1.189 "Fire Protection for Nuclear Power Plants"; March 2007; Rev 1.
2. NUREG-0800 "Standard Review Plan Sec 9.5.1: Fire Protection System"; October 2003; Rev 4, (Formerly NUREG-75/087 March 1979).
3. "Guidelines for Fire Protection for Nuclear Power Plants"; Branch Technical Position ASB 9.5-1; May 1976.
4. "Guidelines for Fire Protection for Nuclear Power Plants"; Branch Technical Position ASB 9.5-1; Rev 1; March 1978.
5. "Recommended Fire Protection Policy and Program Actions" (GL 85-01); October 26, 1984.
6. "NRC Positions on Certain Requirements of Appendix R to 10CFR50" (GL 83-33); October 1983.

Internet & Cable Companies Resources

7. "Anixter Wire & Cable Handbook"; Wire & Cable Group Anixter Inc; 3rd Ed; 1996.
8. "Fire Tests"; Anixter File F-3; Wire & Cable Group Anixter Inc; Aug 2000.
9. "UL Wire & Cable Flammability Testing"; Underwriters Laboratories Inc; www.ul.com/fire/wire.html
10. "Vertical Cable Tray Flame Tests"; Nexans Canada Inc; www.nexans.ca/egy/tecdoc/9.htm
11. "Belden Standards Reference Guide"; Belden Inc; www.belden.com
12. "UL Flame Test Descriptions"; Huber Suhner Group; www.hubersuhner.com
13. "Cable Flame Tests"; Houston Wire & Cable Company; www.houwire.com
14. "Cable Fire Tests"; Presentation by Marcelo M. Hirscher; GBH International; www.fire.tc.faa.gov and <http://155.178.136.36/ppt/materials/CableFireTests.ppt>
15. "Plenum Cable: Proven Safety & Performance"; Presentation by Carson W.G. and Zicherman J.B.; The Vinyl Institute; <http://www.vinylinfo.org/>

Industry Standards

16. "NFPA 805: Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants"; 2001 Ed.
17. Cable Test Standards: (See Table 1).

Table 1:
Cable Standards and Respective Flame Tests

Test Title (Test type)	Standard Organization and Number	Standard Title
FT-6 / Flame Travel Test (horizontal)	NFPA 262	Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces (2007 Ed)
	CSA 22.2 No. 0.3	Test Methods for Electrical Wires and Cables (Jan2005)
Fire Test (Riser/vertical)	UL 1666	Test for Flame Propagation Height of electrical and Optical-Fiber Cables Installed Vertically in Shafts (4 th Ed Nov 2000 Revisions thru Jul2002)
FT-4 / Vertical Flame Test (vertical)	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords (4 th Ed Oct 2001 Revisions thru Aug2006)
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables (2 nd Ed Feb1997 Revisions thru Nov2000)
	UL 83	Thermoplastic-Insulated Wires and Cables (13 th Ed Nov2003 Revisions thru Apr2006)
	UL 44	Thermoset-Insulated Wires and Cables (16 th Ed July2005 Revisions thru Nov2005)
	CSA 22.2 No. 0.3	Test Methods for Electrical Wires and Cables (Jan2005)
	IEEE 1202-1991	IEEE Standard for Flame Testing of Cables for Use in Cable Tray in Industrial and Commercial Occupancies (1991)
Flame test qualification (vertical)	IEEE 383-2003	IEEE Standard for Qualifying Class 1E Electric Cables and Field Splices for Nuclear Power Generating Stations (2003; Revision of IEEE 383-1974)
Vertical Cable Tray Flame Test (vertical)	ICEA T-29-520	Conducting Vertical Cable Tray Flame Tests with Theoretical Heat Input Rate of 210000 Btu/hr (Sep 1986)
Vertical Flame Spread (vertical)	IEC 60332-3-21	Tests on Electric Cables Under Fire Conditions Parts 3-21 to 23: Test for Vertical Flame Spread of Vertically-Mounted Bunched Wires or Cables: Category A (F/R), A & B (Oct2000)
	IEC 60332-3-22	
	IEC 60332-3-23	
Vertical Tray Flame Test (vertical)	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords (4 th Ed Oct2001 Revisions thru Aug2006)
	UL 83	Thermoplastic-Insulated Wires and Cables (13 th Ed Nov2003 Revisions thru Apr2006)
	UL 44	Thermoset-Insulated Wires and Cables (16 th Ed July2005 Revisions thru Nov2005)
	UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables (2 nd Ed Feb1997 Revisions thru Nov2000)
Vertical Cable Tray Flame Test (vertical)	ICEA T-30-520	Guide for Conducting Vertical Cable Tray Flame Tests with Theoretical Heat Input of 70000 Btu/hr (Sep1986)
Flame test (vertical)	IEEE 383-1974	IEEE Standard for Type Test of Class 1E Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations (1974)
Flame test (vertical)	IEEE 817-1993	IEEE Standard Test Procedure for Flame-Retardant Coatings Applied to Insulated Cables in Cable Trays (1993)
Vertical Flame Spread (vertical)	IEC 60332-3-24	Tests on Electric Cables Under Fire Conditions Parts 3-21 to 23: Test for Vertical Flame Spread of Vertically-Mounted Bunched Wires or Cables: Category C (Oct2000)
Vertical Flame Propagation (vertical)	IEC 60332-1-2	Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame (2004-07)

Vertical Flame Propagation (vertical)	IEC 60332-1-3	Test for vertical flame propagation for a single insulated wire or cable - Procedure for determination of flaming droplets/particles (2004-07)
VW-1 Vertical Wire Flame Test (vertical)	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords (4 th Ed Oct 2001 Revisions thru Aug2006)
	UL 83	Thermoplastic-Insulated Wires and Cables (13 th Ed Nov2003 Revisions thru Apr2006)
	UL 44	Thermoset-Insulated Wires and Cables (16 th Ed July2005 Revisions thru Nov2005)
	CSA 22.2 No. 0.3	Test Methods for Electrical Wires and Cables (Jan2005)
FT-1 Vertical Flame Test (vertical)	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords (4 th Ed Oct 2001 Revisions thru Aug2006)
	UL 83	Thermoplastic-Insulated Wires and Cables (13 th Ed Nov2003 Revisions thru Apr2006)
	UL 44	Thermoset-Insulated Wires and Cables (16 th Ed July2005 Revisions thru Nov2005)
	CSA 22.2 No. 0.3	Test Methods for Electrical Wires and Cables (Jan2005)
Flame test (vertical)	IPCEA S-61-402	Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (Oct1994)
FT-2 Horizontal Flame Test (horizontal)	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords (4 th Ed Oct 2001 Revisions thru Aug2006)
	UL 83	Thermoplastic-Insulated Wires and Cables (13 th Ed Nov2003 Revisions thru Apr2006)
	UL 44	Thermoset-Insulated Wires and Cables (16 th Ed July2005 Revisions thru Nov2005)
	CSA 22.2 No. 0.3	Test Methods for Electrical Wires and Cables (Jan2005)
Standard Test Method for Flame Spread (vertical)	ASTM D5537-03	Standard Test Method for Heat Release, Flame Spread, Smoke Obscuration, and Mass Loss testing of Insulating Materials Contained in electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration (Dec2003)
Fire Propagation Test	FM 3972	Test Standard for Cable Fire Propagation (Mar1994)

***Note: A reference hard copy of each standard should be available in the US NRC Technical Library and RES Fire Team.**

Abbreviations & Definitions:

AHJ: Authority Having Jurisdiction

ASTM: American Society for Testing and Materials

CSA: Canadian Standards Association

ICEA: Insulated Cable Engineers Association

IEC: International Electrotechnical Commission

IEEE: Institute of Electrical and Electronics Engineers

FM: Factory Mutual Global

NFPA: National Fire Protection Association

TC: Thermocouple

UL: Underwriters Laboratories

US NRC: United States Nuclear Regulatory Commission

Heat exposure or burner heat output: theoretical heat release rate of the burner.

Heat exposed time (het): total time the flame is applied to the sample

adl/het: (adl) divided by (het)

Max average damage length (adl): max or acceptable damage length of the test

Discussion & Analysis

Several NRC documents, cited in this section, include the requirements for flame propagation for existing or new electrical cables. In general, these documents refer to the IEEE 383-1974 and/or IEEE 1202-1991 flame tests as the NRC accepted test standards for flame propagation. Below is a list of NRC related documents that cite IEEE 383-1974 test as minimum acceptance requirements for flame propagation. Even though these documents may apply to Nuclear Power Plants constructed during different time periods, the standard flame propagation tests accepted to the US NRC are still basically the same.

NFPA 805 (2001 Edition) section 3.3.5.3 states that “*electric cable construction shall comply with a flame propagation test as acceptable to the AHJ (Authority Having Jurisdiction)*”, which in the US Nuclear Industry, is the United States Nuclear Regulatory Commission (US NRC). Below are the US NRC documents which refer to the flame propagation test acceptable to the AHJ.

NUREG-0800 (Rev 4, Oct 2003) states that “*Electrical cables should meet flame test criteria of IEEE 383 or 1202, or be provided with alternative protection as allowed by the specific plant licensing and/or design basis (See Regulatory Guide 1.189)*”.

Appendix A to Branch Technical Position (BTP) APCS 9.5-1 states that “*electric cable constructions should, as a minimum, pass the flame test in the current IEEE 383*”. It also states that “*for cable installation in operating plants and plants under construction that do not meet the IEEE 383 flame test requirements, all cables must be covered with an approved flame retardant coating and properly derated*”.

Reg Guide 1.189 (Rev 1, Mar 2007) states that “*Electric cable construction should pass the flame test in IEEE Standard 383, “IEEE Standard for Type Test of Class IE Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations” (Ref. 109), or IEEE Standard 1202, “IEEE Standard for Flame Testing of Cables for Use in Cable Trays in Industrial and Commercial Occupancies” (Ref. 110).6 (This does not imply that cables passing either test will not require additional fire protection.) For cable installations in operating plants and plants under construction before July 1, 1976, that do not meet the IEEE Standard 383 flame test requirements, all cables should be covered with an approved flame-retardant coating and properly derated or be protected by automatic suppression. Although cable coatings have been shown to reduce flame spread, coated cables are considered intervening combustibles when determining the protection requirements of Section III.G.2 of Appendix R to 10 CFR Part 50. Coated cables do not have higher damage thresholds and, therefore, are not equivalent to IEEE 383 or IEEE 1202 cables. In addition, coated cables can and do ignite in fires*”.

The data and discussion presented in this report on flame propagation tests compares theoretical burner heat output, heat exposure time, and pass/fail criteria to determine the relative severity of the test standards. Each test was reviewed and compared to the

vertical flame propagation test in the IEEE 383-1974 as a baseline to determine if testing conditions and/or passing criteria are comparable. Tests with lower burner heat outputs than the IEEE 383-1974 standard are very difficult to compare due to the difference in test sample size. These low heat exposure tests will be discussed but will not be directly compared to IEEE 383-1974. Below is a brief discussion of each flame tests starting with the IEEE 383-1974 Flame Propagation Test (Baseline tests) and followed by flame spread tests ranked in decreasing order of severity.

Note: A flame propagation test procedure in one Standard could be included or referenced in another standard. This does not mean the two standards are the same; it means that the standard uses same testing procedure for flame propagation testing. A standard might have other sections which have nothing to do with flame propagation, like smoke and aging test procedures, materials of construction, or markings, among other procedures and requirements. For this reason, the data was organized in terms of flame tests instead of individual Standards. Please refer to Table 3, where tests included in various standards are discussed and commentated.

Test Ranking and Description

IEEE 383-1974 is the baseline test the other tests will be compared. It is a 20kW (70000 BTU/hr) heat exposure, vertical test considered the minimum requirement of the US NRC to pass flame propagation criteria. As in all the 20kW (70000 BTU/hr) tests discussed below, it has a 20 minute exposure time. This test requires cables to self extinguish before reaching top of the tray (8ft [2.44m]) to pass the test.

One of the most severe flame tests is the FT-6 Horizontal Flame Test included in the NFPA 262 (issued by NFPA) and CSA C22.2 No. 0.3 standards. It is a horizontal flame test used for cables in plenum applications. This test uses a burner heat output of 86 kW (294000 BTU/hr). This test has one of the lowest acceptable damage lengths the second highest heat output and uses high air flow in its chamber during testing to increase flame spread. This combination of variables makes it one of the most rigorous tests for a sample to pass. This is currently considered the most severe flame test.

The UL1666 Fire Riser Test is another of the more severe flame tests. It is a vertical test used for cables in riser shaft applications. It has the highest heat output of all the tests (154.5 kW [527500 Btu/hr]), second highest exposure time (30 minutes) and high air flow in its chamber during testing. This test has an acceptable cable damage length of 12 ft (3.66m). Even though the damage criteria is less severe than the IEEE 383-1974 (12 ft vs. 10ft), the higher exposed heat and time makes this test more severe.

The FT-4/Vertical Flame Test, included in standards IEEE 1202-1991, CSA C22.2 No. 0.3, UL 1685, and referenced in UL 1581, UL 44, and UL 83, is the most rigorous of the 20kW (70000 BTU/hr) tests. The testing conditions and equipment in all of the 20kW (70000 BTU/hr) tests are essentially the same. What makes this test the most difficult to pass of the 20kW (70000 BTU/hr) tests is its low acceptable damage length of 4.9ft (1.5m).

The IEEE 383-2003 standard Flame Test qualification cites: *“Cable shall be flame retardant in accordance with the requirements of IEEE Std 1202-1991 or NFPA 262-*

2002. *Switchboard cables, coaxial, twinaxial, and triaxial cables shall as a minimum pass the UL VW-1 flame test.*" This citation is the only direction the IEEE 383-2003 standard gives on cable flame propagation testing. The IEEE organization superseded IEEE 383-1974 standard with IEEE 383-2003 in 2003. Still, the US NRC standards on flame propagation tests are IEEE 383-1974 or IEEE 1202-1991 as cited on the NRC documents previously discussed.

The ICEA T-29-520 (issued by ICEA) standard is essentially the same as the 20kW (70000 BTU/hr) IEEE 383-1974 tests except with a burner heat output of 62kW. In this test the distance acceptance criteria is the same as IEEE 383-1974: 8ft (2.44m). Cables tested using this test will meet or exceed performance of IEEE 383-1974 tested cables, and could have similar cable performance to tests like the FT-4/Vertical Flame Test.

The Vertical Flame Spread test (IEC 60332-3-21, IEC 60332-3-22 and IEC 60332-3-23 [issued by IEC]) uses a burner of 20kW (70000 BTU/hr) heat output. In these tests, the recommended acceptance length of damage is 10.2 ft (3.1m) which is less rigorous than the 8 ft (2.44m) of acceptable damage of the IEEE 383-1974 standard, but the heat exposure time is 40 min which is twice the time exposed in IEEE 383-1974. In order to compare the severity of these IEC's tests with IEEE 383-1974 test, we calculated the maximum average damage length (adl) per heat exposed time (het) (see definitions). Assuming most of the damage will occur during flame application times, we can calculate an average adl/het of 0.4 ft of damage/minute (during the 20 minutes of flame application) for the IEEE 383-1974 test and an average adl/het of 0.255 ft of damage/minute (during the 40 minutes of flame application) for the IEC tests. If we compare these two values, we can observe that any sample which has an average adl/het greater (during flame application) than the calculated should fail the test. In this case, the IEC test will be more rigorous than the IEEE 383-1974.

The Vertical Tray Flame Test (UL 1581, 1685, 83, and 44) and Vertical Cable Tray Flame Test (ICEA T-30-520 [issued by ICEA]) both use a burner with a 20kW (70000 BTU/hr) heat output. These two tests are very similar to the IEEE 383-1974. The three have the same acceptable damage length of 8 ft (2.44m) and require cables to self extinguish before reaching the top of the tray. Also, the heat exposure time is 20 minutes. These tests have minor variations in procedure and equipment used. IEEE 817-1993 Flame Test is mainly used to determine whether cables need to be coated or not. It does not have pass/fail criteria. If cable damage reaches the top of the tray, the cable is recommended to be coated.

The IEC 60332-3-24 standard is very similar to IEEE 383-1974 but has less strict acceptance criteria. This test has the same burner heat output and exposure time as IEEE 383-1974 but has an acceptable damage length of 10.2ft (3.1m) making the test less severe.

Note that the IEC 60332-3-10 standard is the description of the apparatus used in the IEC 60332-3-21, IEC 60332-3-22, IEC 60332-3-23, and IEC 60332-3-24 standards discussed above and not an actual test.

Low Intensity Test Methods

The tests discussed below have burner heat outputs equal to or lower than, 1kW (3400 BTU/hr). It is not prudent to compare these methods to IEEE 383-1974 due to the vast difference in test samples and burner heat outputs. These low heat exposure tests will be discussed for completeness of this report, but will not be directly compared to the IEEE 383-1974 baseline Standard.

Vertical Flame Propagation Tests (IEC 60332-1-2 and IEC 60332-1-3) are both 1kW (3400 BTU/hr) of heat exposure (Burner Heat Output) tests. Both exposure times vary from 1-8 minutes, depending on the sample diameter. IEC 60332-1-2 requires more than 50mm (1.97in) of distance between the lower edge of the top support and the onset of charring and less than 540mm (21.26in) from the lower edge to the top support. IEC 60332-1-3 requires that the filter paper used as indicator does not ignite during the test.

The four 500W (1700 BTU/hr) tests are very similar in terms of heat exposure time and passing criteria. These tests are: the VW-1 Vertical Wire Flame Test (UL 1581 and CSA C22.2 No.0.3, and referenced in UL 83 and UL 44), the FT-1 Vertical Flame Test (UL 1581 and CSA 22.2 No.0.3 and referenced in UL83 and UL44), Flame Test (ICEA S-61-402), and the FT-2 Horizontal Flame Test (UL 1581 and CSA 22.2 No.0.3, and referenced in UL 83, and UL 44). The first three are vertical flame tests and have exposure times of 75 seconds total with different time intervals between heat applications. The three are very similar and require that samples do not burn more than 60 seconds or burn less than 25% of the indicator and/or cotton batting. The FT-2 test is a horizontal test with a heat exposure time of 30 seconds and requires that the cable self-extinguishes and that no flaming particles ignite cotton under specimen.

The ASTM D5537-03 *Standard Test Method for Flame Spread* is used to determine the heat release rate by measuring gas concentrations and flow. It also measures Flame Propagation by blistering and char length. This test does not have any acceptance criteria.

The FM 3972 *Test Standard for Cable Fire Propagation* is used to calculate a Fire Propagation Index to classify cable fire propagation characteristics. In the test procedure, a pilot flame is used to ignite the cables. After that, the flame is extinguished and heaters are used until the cable self-extinguishes. Measurements of the combustion gas concentrations and flow, time, and heat release rate are used to calculate the Fire Propagation Index. This test does not have any acceptance criteria.

The following Standard identified in NRR FAQ 06-0022 could not be found:
IPCEA S-16-81: No title was provided.

Table 2:
Testing conditions and acceptance criteria

Test name(s) (Test type)	Test Standard #	Acceptance Criteria		Test Exposure Conditions	
		Acceptable Damage Length	Other Acceptance Criteria	Burner Heat Output	Exposure Time
FT-6 /Flame Travel Test (horizontal)	NFPA 262	5 ft (1.5m)	Max temperature shall be 542°F (267°C)	86 kW (294000 Btu/hr)	20 min
	CSA 22.2 No. 0.3				
Fire Test (Riser/vertical)	UL 1666	12 ft (3.66m)	Any TC shall not exceed 850°F (454.4°C)	154.5 kW (527500 Btu/hr)	30 min
FT-4 / Vertical Flame Test (vertical)	UL 1581	4.9 ft (1.5m)	N/A	20 kW (70000 Btu/hr)	20 min
	UL 1685				
	UL 83				
	UL 44				
	CSA 22.2 No. 0.3				
	IEEE 1202-1991				
Flame test qualification (vertical)	IEEE 383-2003	Refers user to IEEE 1202-1991 or NFPA 262 flame propagation test procedure.			
Vertical Cable Tray Flame Test (vertical)	ICEA T-29-520	8 ft (2.44m)	Cables that self extinguish pass the test; fail if the flame propagates to the total height of the tray (8 ft (2.44m)).	62 kW (210000 Btu/hr)	20 min
Vertical Flame Spread (vertical)	IEC 60332-3-21	10.2 ft (3.1m)	N/A	20 kW (70000 Btu/hr)	40 min
	IEC 60332-3-22				
	IEC 60332-3-23				
Vertical Tray Flame Test (vertical)	UL 1581	8 ft (2.44m)	Requires cable to self extinguish before reaching top of the tray.	20 kW (70000 Btu/hr)	20 min
	UL 83				
	UL 44				
	UL 1685				
Vertical Cable Tray Flame Test (vertical)	ICEA T-30-520	8 ft (2.44m)	Cable damage shall not extend to the top of the tray (8 ft (2.44m))	20 kW (70000 Btu/hr)	20 min
Flame test (vertical)	IEEE 383-1974	8 ft (2.44m)	Cables that self extinguish pass the test; fail if the flame propagates to the total height of the tray (8 ft (2.44m)).	20 kW (70000 Btu/hr)	20 min
Flame test (vertical)	IEEE 817-1993	N/A	When flame is removed the cable needs to self-extinguish. Uncoated cables that burn to the top of the tray are suitable for testing coatings.	20 kW (70000 Btu/hr)	20 min
Vertical Flame Spread (vertical)	IEC 60332-3-24	10.2 ft (3.1m)	N/A	20 kW (70000 Btu/hr)	20 min
Vertical Flame Propagation (vertical)	IEC 60332-1-2	N/A	Requires more than 50 mm (1.97in) of distance between the lower edge of the top support and the onset of charring and less than 540mm (21.26in) from the lower edge to the top support.	1 kW (3400 Btu/hr)	1-8 min (depends on sample diameter)
Vertical Flame Propagation (vertical)	IEC 60332-1-3	N/A	Requires that the filter paper does not ignites during the test.	1 kW (3400 Btu/hr)	1-8 min (depends on sample diameter)

VW-1 Vertical Wire Flame Test (vertical)	UL 1581	N/A	If sample burns for more than 60 sec the sample fails the test. If 25% or more of the cotton batting or indicator flag burns the cable fails test.	500 W (1700 Btu/hr)	75 sec (flame applied 5 times of 15 sec with time intervals of no more than 60 sec)
	UL 83				
	UL 44				
	CSA 22.2 No. 0.3				
FT-1 Vertical Flame Test (vertical)	UL 1581	N/A	If sample burns for more than 60 sec the sample fails the test. If 25% or more of the indicator flag burns the cable fails test.	500 W (1700 Btu/hr)	75 sec (flame applied 5 times of 15 sec with time intervals of no more than 60 sec)
	UL 83				
	UL 44				
	CSA 22.2 No. 0.3				
Flame test (vertical)	IPCEA S-61-402	N/A	If sample burns for more than 60 sec (after fifth flame application) or if 25% of the indicator has burned the sample fails test.	500 W (1700 Btu/hr)	75 sec (flame is applied 5 times of 15 sec with around 15 sec intervals between applications)
FT-2 Horizontal Flame Test (horizontal)	UL 1581	N/A	No flaming particles shall drop from the specimen causing the cotton under the specimen to ignite and the cable should self-extinguish.	500 W (1700 Btu/hr)	30 sec
	UL 83				
	UL 44				
	CSA 22.2 No. 0.3				
Standard Test Method for Flame Spread (vertical)	ASTM D5537-03	N/A	N/A	20 kW (70000 Btu/hr)	20 min
Fire Propagation Test (vertical)	FM 3972	N/A	Until cables self-extinguish	50 kW (175000 Btu/hr) *(heater output)	

Table 3:
Comments on Flame Propagation Tests included in more than one standard

Test name (Test type)	Cable Standard #	Comments
FT-6 / Flame Travel Test (horizontal)	NFPA 262	This standard includes procedure and requirements of the FT-6 / Horizontal Flame Travel Test
	CSA 22.2 No. 0.3 sec 4.11.6 & App A	This Standard refers (sends) user to use FT-6 / Horizontal Flame Travel Test procedure in NFPA 262 standard
FT-4 / Vertical Flame Test (vertical)	IEEE 1202-1991	These standards include procedure and requirements of the FT-4 / Vertical Flame Test
	CSA 22.2 No. 0.3 sec 4.11.4 & App A	
	UL 1685 sec 12-19	
	UL 44 sec 5.14.6 & 8.14.6	These Standards refers (sends) user to use FT-4 / IEEE1202 Vertical Tray Flame Test procedure in UL 1685 or CSA 22.2 No. 0.3 standards
	UL 83 sec 5.12.5, 5.12.6.3 & 8.12.5	
	UL 1581 sec 1164	
Flame test qualification (vertical)	IEEE 383-2003	This standard refers (sends) user to use Flame Tests procedure of NFPA 262 (horizontal flame test) or IEEE 1202-1991 (vertical flame test) standards
Vertical Flame Spread (vertical)	IEC 60332-3-21	These tests follow the same procedure and apparatus on IEC 60332-3-10 Standard but the requirements apply to different category cables A (F/R), B and C.
	IEC 60332-3-22	
	IEC 60332-3-23	
Vertical Tray Flame Test (vertical)	UL 1685 sec 4-11	This standard include procedure and requirements of the Vertical Tray Flame Test (also called UL Flame Exposure)
	UL 44 sec 5.14.5 & 8.14.5	
	UL 83 sec 5.12.6.2 & 8.12.6.1	
	UL 1581 sec 1160	This Standard refers (sends) user to use Vertical Tray Flame Test in UL 1685 standard
VW-1 Vertical Wire Flame Test (vertical)	UL 1581 sec 1080	This standard includes procedure and requirements of the VW-1 Vertical Wire Flame Test
	CSA 22.2 No. 0.3 sec 4.11.7 & App A & D	
	UL 44 sec 5.14.4 & 8.14.4	This Standard refers (sends) user to use VW-1 Vertical Wire Flame Test in UL 1581 or CSA 22.2 No. 0.3 standards
	UL 83 sec 8.12.1 & 8.12.3	
FT-1 Vertical Flame Test (vertical)	UL 1581 sec 1060	This standard includes procedure and requirements of the FT-1 Vertical Flame Test
	CSA 22.2 No. 0.3 sec 4.11.1 & App A	
	UL 44 sec 5.14.3 & 8.14.3	This Standard refers (sends) user to use FT-1 Vertical Flame Test in UL 1581 or CSA 22.2 No. 0.3 standards
	UL 83 sec 8.12.2	
FT-2 Horizontal Flame Test (horizontal)	UL 1581 sec 1100	This standard includes procedure and requirements of the FT-2 Horizontal Flame Test
	CSA 22.2 No. 0.3 sec 4.11.2 & App A	
	UL 44 sec 5.14.1 & 8.14.1	This Standard refers (sends) user to use FT-2 Horizontal Flame Test in UL 1581 or CSA 22.2 No. 0.3 standards
	UL 83 sec 8.12.3.2	

Summary of Results

The following tables provide a summary of the testing methods that are more severe than IEEE 1202-1991 (Table 4) or more severe than IEEE 383-1974 (Table 5).

The flame propagation tests in Table 4 have more rigorous acceptance criteria than IEEE 1202-1991. Cables tested by any of these methods should have similar or better flame propagation resistance than if tested by the IEEE 1202-1991 test method.

Table 4:
More Severe Tests (Standards) than IEEE 1202-1991

Test name (Test type)	Cable Standard #
FT-6 / Flame Travel Test (horizontal)	NFPA 262
	CSA 22.2 No. 0.3
Fire Test (Riser/vertical)	UL 1666
FT-4 / Vertical Flame Test (vertical)	UL 1581
	UL 1685
	UL 83
	UL 44
	CSA 22.2 No. 0.3
	IEEE 1202-1991
Flame test qualification (vertical)	IEEE 383-2003

The flame propagation tests in Table 4 also have more rigorous acceptance criteria than IEEE 383-1991. Cables tested by any of these methods should have similar or better flame propagation resistance than if tested by IEEE 383-1974 test method. Note that all test standards in Table 4 are also included in Table 5, since IEEE 1202-1991 is a more rigorous test method than IEEE 383-1974.

Table 5:
More Severe Tests (Standards) than IEEE 383-1974

Test name (Test type)	Cable Standard #
FT-6 / Flame Travel Test (horizontal)	NFPA 262
	CSA 22.2 No. 0.3
Fire Test (Riser/vertical)	UL 1666
FT-4 / Vertical Flame Test (vertical)	UL 1581
	UL 1685
	UL 83
	UL 44
	CSA 22.2 No. 0.3
	IEEE 1202-1991
Flame test qualification (vertical)	IEEE 383-2003
Vertical Cable Tray Flame Test (vertical)	ICEA T-29-520
Vertical Flame Spread (vertical)	IEC 60332-3-21
	IEC 60332-3-22
	IEC 60332-3-23
Vertical Tray Flame Test (vertical)	UL 1581
	UL 83
	UL 44
	UL 1685
Vertical Cable Tray Flame Test (vertical)	ICEA T-30-520
Flame test (vertical)	IEEE 383-1974

Conclusion

Electrical cables tested in accordance with, and meeting the flame propagation acceptance criteria of one or more of the Test Standards listed in Table 5 should be considered to perform equal to, or better than if they were tested to in IEEE 383-1974. Low burner heat output tests discussed in this report are not recommended to be accepted due to the impractical nature of comparing these small scale screening test requirements (e.g. low thermal exposure, sample size, time exposure and acceptance criteria) to the US NRC minimum accepted test methods and acceptance criteria of larger scale IEEE 383-1974.

Attachment 2:

FAQs

FAQ #	Rev.	ADAMS #
06-0001	0	ML061440419
06-0002	0	ML061440420
	1	ML063170357
	2	ML063350515
06-0003	0	ML061440422
	1	ML063170355
06-0004	0	ML061440430
06-0005	0	ML062350095
	1	ML063180544
06-0006	0	ML062350109
	1	ML063170360
	2	ML063540308
06-0007	0	ML062350121
	1	ML070030325
	2	ML070510442
	3	ML071550408
06-0008	0	ML062860250
	1	ML070510499
	2	ML070800007
	3	ML071020160
	Att.	ML071020169
	4	ML071080099
	5	ML071340180
06-0011	0	ML062890271
	1	ML070510505
06-0012	0	ML062860255
	1	ML063170362
	2	ML070850610
	3	ML071380228
	4	ML071570260
06-0016	0	ML070030348
	1	ML071020174
06-0017	0	ML070030383
	1	ML071350432
	2	ML071570255
06-0018	0	ML070030427
	1	ML071020181
06-0019	0	ML070030437
	1	ML071340184
06-0020	0	ML070030443
	1	ML071340188
06-0021	0	ML070030457
	1	ML071340192
06-0022	0	ML070030459

06-0023	0	ML070030470
06-0024	0	ML070030472
06-0025	0	ML070030476
	1	ML071340194
06-0026	0	ML070030480
06-0027	0	ML071380236
06-0028	0	ML070030489
	1	ML071340195
	2	ML071550415
07-0031	0	ML071380238
07-0032	0	ML071930378
07-0033	0	ML071930379
07-0035	0	ML071650151

Attachment 3:

FAQ Meeting Notices and Summaries

Month	Doc.	ADAMS #
July	MN	ML061870560
	MS	ML062080126
August	MN	ML062200116
	MS	ML062400278
September	MN	ML062510281
	MS	ML062900031
October	MN	ML062850488
	MS	ML063350031
November	MN	ML063120170
	MS	ML063410377
December	MN	ML063390132
	MS	ML070220420
January	MN	ML070040380
	MS	ML070360630
February	MN	ML070290267
	MS	ML070640531
March	MN	ML070640417
	MS	ML071090164
April	MN	ML070920255
	MS	ML071420174
May	MN	ML071220176
	MS	ML071510425
June	MN	ML071440064
	MS	ML071940375
July	MN	ML071830089

Brandon,

Comments on FAQ 8 handout of the meeting; both RL/SO and with all changes accepted.

Chuck

Charles Moulton
Fire Protection Engineer
NRR/DRA/AFPB
Phone: 415-2751
Mailstop: O11A11

>>> "JAMAR, Brandon" <btj@nei.org> 7/18/2007 1:39 PM >>>
Chuck,

Does the NRC have anything planned for either closure or comments to FAQs for tomorrow's meeting? Any advance notice, or material would be greatly appreciated.

Thanks!

Brandon

Brandon T. Jamar
Project Manager, Engineering

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nuclear. clean air energy.

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Mail Envelope Properties (469F7A87.D49 : 12 : 9706)

Subject: Re: NFPA 805 - FAQ updates
Creation Date 7/19/2007 10:51:51 AM
From: Charles Moulton

Created By: CEM4@nrc.gov

Recipients	Action	Date & Time
nei.org 10:52:19 AM btj (Brandon JAMAR) jhr CC (Jim RILEY)	Transferred	7/19/2007

nrc.gov TWGWPO04.HQGWDO01 10:51:54 AM SDW1 CC (Sunil Weerakkody)	Delivered	7/19/2007
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Post Office	Delivered	Route
TWGWPO04.HQGWDO01	7/19/2007 10:51:54 AM nrc.gov	nei.org

Files	Size	Date & Time
MESSAGE	3462	7/19/2007 10:51:51 AM
AFPB Staff Comments on FAQ 8R5.pdf	1215416	7/19/2007
10:44:32 AM		
AFPB Staff Comments on FAQ 8R5 (changes accepted).pdf	960962	7/19/2007 10:48:3

Options

Auto Delete: No
Expiration Date: None
Notify Recipients: Yes
Priority: Standard
ReplyRequested: No
Return Notification: None

Concealed Subject: No
Security: Standard

To Be Delivered: Immediate
Status Tracking: Delivered & Opened

Attachment 1:

Plant: Harris
Contact: Jeff Ertman

Date: 5/2/07
Phone: 919-546-3681
Email: jeffrey.ertman@pgnmail.com

Distribution: *(NEI Internal Use)*

X 805TF X FPWG ☐ RATF ☐ RIRWG ☐ BWROG ☐ PWROG

Purpose of FAQ:

The purpose of FAQ 06-0008 is to provide a ~~process~~/method for the use of fire protection engineering analyses post-transition to address NFPA 805 Chapter 3 requirements. Currently, licensees may self approve these evaluations under the existing fire protection license conditions. The ~~process~~/method discussed in this FAQ will be submitted for approval as part of the transition license amendment request (LAR). The ~~process~~/method to be submitted in the LAR is to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
- for deviations from the NFPA codes, standards and listings for rated components in NFPA 805.

Post-transition, licensees will use this ~~process~~/method to self approve acceptable fire protection engineering analyses.

Is this Interpretation of guidance? ☒ Yes / No

Proposed new guidance not in NEI 04-02? ☒ Yes / No

Details:

NEI 04-02 guidance needing interpretation (include section, paragraph, and line numbers as applicable):

Sections 2.2, 2.3, 2.4, 4.3.1, 4.6.1, 5.3.2, Appendix H, and Appendix I of NEI 04-02 Revision 1.

Circumstances requiring guidance interpretation or new guidance:

Risk-informed, performance-based fire protection engineering analyses are an acceptable alternative to the deterministic approaches in NFPA 805 Chapter 4. ~~Some sections of Chapter 3 are conditional based upon Chapter 4 requirements; therefore, risk informed, performance-based methods are allowed for those sections under NFPA 805 / 10 CFR 50.48 (c).~~ Risk-informed, performance-based fire protection engineering analyses may also be needed to document the acceptability of fire protection systems and features addressed in NFPA 805 Chapter 3 sections ~~that are not conditional based upon Chapter 4 requirements~~. Current licensing basis allows flexibility to use performance-based technical

analysis per Generic Letter 86-10. An approach using these types of analyses is needed to allow this flexibility following transition to NFPA 805.

DRAFT

Detail contentious points if licensee and NRC have not reached consensus on the facts and circumstances:

The fire protection program elements and minimum design requirements of NFPA 805 Chapter 3 may be subject to the performance-based methods permitted elsewhere in NFPA 805 per 10 CFR 50.48(c)(2)(vii), as long as the appropriate regulatory processes (i.e., a license amendment request) are utilized.

A process for a 10 CFR 50.48(c)(2)(vii) License Amendment Request has not yet been agreed upon.

Potentially relevant existing FAQ numbers:

FAQ 06-0004 includes a process for defining fire protection systems and features required to meet NFPA 805 Chapter 3 criteria.

Response Section:

Proposed resolution of FAQ and the basis for the proposal:

~~A high-level purpose of NFPA 805, as implemented under the endorsement of 10 CFR 50.48(c), is to clarify how licensees may use the flexibility afforded by 10 CFR 50.48(c)(2)(vii) to develop a process to maintain the current flexibility available to licensees under Generic Letter (GL) 86-10 evaluations.~~

BACKGROUND

~~The rulemaking performed to implement 10 CFR 50.48(c) identified the need to be able to utilize performance-based methods on the fundamental fire protection program elements and design requirements in Chapter 3. To address this need, 10 CFR 50.48(c) included a provision that allows licensees to use performance-based methods on Chapter 3 attributes, upon receipt of NRC approval.~~

~~Prior to transition, under the standard license condition of GL 86-10, licensees are allowed to make certain types of changes without prior NRC approval as long as the changes do not adversely affect the plant's ability to achieve and maintain safe shutdown in the event of a fire.~~

~~10 CFR 50.48(c) requires licensees to submit 10 CFR 50.90 license amendment requests for any changes to Chapter 3 features of NFPA 805, unless they have been previously approved by the NRC. Under the standard license condition of GL 86-10, licensees are allowed to make certain types of changes without prior NRC approval as long as the changes do not adversely affect the plant's ability to safely shutdown in the event of a fire.~~

~~To apply this process/method, licensees must send the proposed process/methods outlined in this FAQ to the NRC for approval. Then, they may use the approved processes/methods without prior approval for specific applications, as long as the~~

~~application is within the bounds of NRC approval of the proposed methods/processes. Approval of a license amendment for the use of this process would constitute a “previously approved alternative” as discussed in NFPA 805 Section 3.1.~~

~~The licensees’ process/methodology must request an amendment under 10 CFR 50.90, using the flexibility available under 10 CFR 50.48(c)(2)(vii), “Performance-Based Methods”, to allow 10 CFR 50.48(c) licensees to establish a process that enables them to make changes to features required by Chapter 3 of NFPA 805, as long as those changes only affect the referenced codes, standards and listings, such as NFPA, Underwriters Laboratory, Inc. or Factory Mutual listings (Note that referenced codes and standards refer to the “code of record” as defined in section 1.8 of NFPA 805. A licensee’s code of record may be different than those referenced in NFPA 805). Under the proposal the licensee will commit to a process to evaluate deviations from secondary codes and listings required by NFPA 805 Chapter 3. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).~~

~~Therefore, application of this process/method requires two steps. First, the process/methods and bounds of the process must be submitted to the NRC for approval. Second, following approval by the NRC, all plant specific changes made under this license amendment will undergo the same evaluation process as part of 10 CFR 50.48(c)(2)(vii). This second step, application of the process/method, will not require NRC approval. This process/method would not apply to NFPA 805 Chapter 3 changes that do not relate to either NFPA codes or listings or changes that are not conditional based on NFPA 805 Chapter 4. These types of changes would continue to require individual 10 CFR 50.90 license amendment requests addressing the specific deviation.~~

PROCESS

This FAQ proposes to utilize the NFPA 805 Change Evaluation process as defined in NEI 04-02 (including consideration of Defense-in-Depth and Safety Margins), as the process for determining acceptability for changes to NFPA 805 Chapter 3 requirements that are implemented through referenced codes, standards and listings.

To apply this method, licensees must send the proposed methods outlined in this FAQ (the Change Evaluation process defined in NEI 04-02) to the NRC for approval. Then, they may use the approved method without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods. Approval of a license amendment for the use of this process would constitute a “previously approved alternative” as discussed in NFPA 805 Section 3.1.

The licensee must request an amendment under 10 CFR 50.90, using the flexibility available under 10 CFR 50.48(c)(2)(vii), “Performance-Based Methods”. Once approved, the license amendment would allow licensees to make changes to NFPA 805 Chapter 3 requirements, as long as those changes only affect the referenced codes, standards and listings, such as NFPA, Underwriters Laboratory, Inc. or Factory Mutual listings (Note that

referenced codes, standards and listings refer to the “code of record” as defined in section 1.8 of NFPA 805. A licensee’s code of record may be different than those referenced in NFPA 805). Under the proposal the licensee will commit to a process to evaluate deviations from referenced codes, standards and listings required by NFPA 805 Chapter 3. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

Therefore, application of this method requires two steps. First, the methods and bounds of the process must be submitted to the NRC for approval. Second, following approval by the NRC, all plant specific changes made using the method proposed and approved under this license amendment will undergo the same evaluation process as required by 10 CFR 50.48(c)(2)(vii). This second step, application of the method, will not require NRC approval.

This method would not apply to NFPA 805 Chapter 3 changes that do not refer to codes, standards or listings. These types of changes would continue to require individual 10 CFR 50.90 license amendment requests addressing the specific deviation.

Proposed addition to the post-NFPA transition fire protection standard license condition (Section C.3.1 of Regulatory Guide 1.205):

~~“Licensees may perform change evaluations for fundamental fire protection program and design elements of NFPA 805 Chapter 3 that are conditional based on NFPA 805 Chapter 4 requirements.”~~

Licensees may **also** perform change evaluations for deviations from the **NFPA codes, standards and listings referenced in NFPA 805 Chapter 3 for rated components mentioned in NFPA 805**, without a 10 CFR 50.90 submittal, as long as the specific requirement for the feature is not included in NFPA 805 Chapter 3 **itself**, and the NFPA 805 change process is used.”

The following provides the sections of NFPA 805 that will utilize this **process/method**. ~~Sections that are addressed conditionally by Chapter 4 performance-based process are also identified for completeness.~~

Column Heading Definition:

Fire Protection Engineering Analysis Process Applicable: Sections of NFPA 805 Chapter 3 containing referenced codes, standards and listings. Note the “Applicability” would only apply to the referenced codes, standards and listings contained within these sections, and the process could not be used to change the NFPA 805 Chapter 3 specific requirements.

~~**Chapter 4 Conditional Section:** These NFPA 805 Chapter 3 sections are conditional based upon NFPA 805 Chapter 4 requirements. The requested use of fire protection engineering evaluations for these sections are not limited to referenced codes and listings.~~

DRAFT

Fire Protection Engineering Analysis and Chapter 4 Not Applicable: These NFPA 805 Chapter 3 sections do not have ~~NFPA 805 Chapter 4 conditions and~~ do not have referenced codes, ~~standards~~ and listings. Therefore, the ~~process~~/method associated with this FAQ is not applicable and would be outside the scope of the associated LAR.

Section	Title	FP Eng. Analysis Process Applicable	Chapter 4 Conditional Section	FP Eng. Analysis Process and Chapter 4 Not Applicable
3.1	General			X
3.2	Fire Protection Plan			X
3.2.1	Intent			X
3.2.2	Management Policy Direction and Responsibility			X
3.2.3	Procedures			X
3.3	Prevention			X
3.3.1	Fire Prevention for Operational Activities	X		
3.3.2	Structural	X		
3.3.3	Interior Finishes	X		
3.3.4	Insulation Materials			X
3.3.5	Electrical			X
3.3.6	Roofs	X		
3.3.7	Bulk Flammable Gas Storage	X		
3.3.8	Bulk Storage of Flammable and Combustible Liquids	X		
3.3.9	Transformers			X
3.3.10	Hot Pipes and Surfaces			X
3.3.11	Electrical Equipment (Note 1)			X
3.3.12	Reactor Coolant Pumps (Note 1)			X
3.4	Industrial Fire Brigade			
3.4.1	On-Site Fire Fighting Capability	X		
3.4.2	Pre-Fire Plans			X

Section	Title	FP Eng. Analysis Process Applicable	Chapter 4 Conditional Section	FP Eng. Analysis Process and Chapter 4 Not Applicable
3.4.3	Training and Drills	X		
3.4.4	Fire Fighting Equipment	X		
3.4.5	Off-Site Fire Department Interface			X
3.4.6	Communications			X
3.5	Water Supply	X		
3.6	Standpipe and Hose Stations	X		
3.7	Fire Extinguishers	X		
3.8	Fire Alarm and Detection Systems		X	
3.8.1	Fire Alarm		X	
3.8.2	Detection		X	
3.9	Automatic and Manual Water-Based Fire Suppression Systems		X	
3.10	Gaseous Fire Suppression Systems		X	
3.11	Passive Fire Protection Features		X	
3.11.1	Building Separation (Note 3)			X
3.11.2	Fire Barriers		X	
3.11.3	Fire Barrier Penetrations		X	
3.11.4	Through Penetration Fire Stops (Note 2)		X	
3.11.5	Electrical Raceway Fire Barrier Systems (ERFBS)		X	

~~Note 1 – Separate FAQs will be used to clarify the applicability of engineering analyses to the requirements of Section 3.3.11 and 3.3.12 of NFPA 805.~~

~~Note 2 – Through penetration fire stops referenced in Section 3.11.4 of NFPA 805 are considered conditional based upon NFPA 805 Chapter 4 requirements, since they are integral to fire barriers (Section 3.11.2)~~

Note 3 – Section 3.11.1 of NFPA 805 contains an exception for performance-based analysis. The process in this FAQ is not applicable.

EXAMPLE

Section 3.6.1 of NFPA 805 requires a hose system to be installed per NFPA 14. Using this process/method, a hose system must be available and have access to “all power block buildings,” and must also be a Class III standpipe, but may deviate from other specific requirements of NFPA 14 **if the deviation is evaluated and found to be acceptable using this methodology**. These deviations must not contradict other text in Chapter 3 of NFPA 805. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

JUSTIFICATION

Since this ~~process~~/method will be approved by the NRC as part of the 10 CFR 50.90 submittal, it will meet the legal requirement of 10 CFR 50.48(c)(2)(vii). The basis for the change evaluation to be included in the 10 CFR 50.90 submittal will be that each individual change will be evaluated against the NFPA 805 change process (NFPA 805 performance goals / objectives / criteria, defense-in-depth and safety margins evaluation), and providing this flexibility does not adversely impact the features required by Chapter 3 of NFPA 805 to ensure the NFPA 805 performance goals, performance objectives, and performance criteria are satisfied. By only allowing changes to NFPA 805 Chapter **34 conditional sections and the secondary referenced codes, standards and listings**, the changes are bounded. All features required by Chapter 3 will continue to be required (unless specifically addressed separately from this process in an LAR). **NFPA 805 Chapter 3 features addressed by Secondary referenced codes, standards and listings features** may be changed based on an evaluation, using the required methods **described in this FAQ (once reviewed and approved by the NRC in the license amendment)** in a similar manner as is currently allowed under the Generic Letter 86-10 license condition, without prior NRC approval.

The method will ensure that the following requirements are met:

10 CFR 50.48(c)(2)(vii) Requirement	Method of Accomplishment
(a) The required NFPA 805 performance goals, performance objectives, and performance criteria are satisfied.	The fire protection engineering analysis process includes the assessment of impact on NFPA 805 performance goals, performance objectives, and performance criteria are satisfied. Impact will be assessed per risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J and supplemented by RG 1.205 Section 3.2.
(b) Safety margins are maintained.	Maintaining safety margins will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J and supplemented by RG 1.205 Section C.3.2.
(c) Fire protection defense-in-depth is maintained.	Maintaining fire protection defense-in-depth will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J

and supplemented by RG 1.205 Section C.3.2.

~~The LAR will contain the following information per Regulatory Guide 1.205 Section C.3.2.3:~~

RG 1.205 Guidance	Method of Accomplishment
(a) detailed description of the alternative risk-informed, performance-based method	The process is not considered an "alternative method". Existing risk-informed, performance-based methods will be applied, but for a limited scope of NFPA 805 Chapter 3 sections: <ul style="list-style-type: none"> When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and For deviations from the NFPA codes and listings for rated components mentioned in NFPA 805.
(b) 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	Risk-informed, performance-based fire protection engineering analyses will be allowed to be applied <ul style="list-style-type: none"> When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and For deviations from the NFPA codes and listings for rated components mentioned in NFPA 805
(c) 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	Acceptance criteria for changes will use the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J (and supplemented by RG 1.205 Section 3.2).
(d) for PSA-based methodologies, an explanation of how the PSA is of sufficient technical adequacy for evaluation of the changes to which it will be applied	Technical adequacy of the PSA used in the risk-informed, performance-based approach will be in accordance with RG 1.205.
(e) for PSA-based methodologies, a description of the peer review and how the review findings have been addressed	Peer review of the PSA used in the risk-informed, performance-based approach will be in accordance with RG 1.205.

CONCLUSION

This ~~process~~/method will permit a risk-informed, performance-based approach to evaluate Fire Protection Program changes to features required by NFPA 805 Chapter 3 within the bounds of ~~secondary~~ referenced codes, standards and listings ~~or changes that are conditional based on NFPA 805 Chapter 4~~. Following NRC approval of a 10 CFR 50.90 license amendment, this ~~process~~/methodology will permit licensees to evaluate Chapter 3 fire protection features in referenced codes standards and listings without prior NRC approval. Other NFPA 805 Chapter 3 issues not involving NFPA codes, standards or listings ~~or changes that are not conditional based on NFPA 805 Chapter 4~~, would have to be submitted for NRC approval on a case by case basis.

If appropriate, provide proposed rewording of guidance for inclusion in the next Revision:

[See attached proposed revision to NEI 04-02]

DRAFT

Section 2.2, page 7, 3rd paragraph:

- **Performance-Based Methods, § 50.48(c)(2)(vii)** - The prohibition in Section 3.1 of NFPA 805 that does not permit the use of performance-based methods for the Chapter 3 fundamental fire protection program elements and minimum design criteria is not endorsed. The NRC takes this exception in order to provide licensees greater flexibility in meeting the fire protection program elements and minimum design requirements of Chapter 3 by the use of performance-based methods (including the use of risk-informed methods) described in the NFPA 805 standard. Licensees who wish to deviate from Chapter 3 requirements must submit a license amendment request for NRC approval.

Refer to Appendix L for a ~~process~~/method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:-

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
 - for deviations from the ~~referenced~~ NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.

Section 2.3, page 9, 2nd paragraph:

“Compliance with Chapter 3 of NFPA 805 may be demonstrated by showing that the specific requirements are met either directly or by the use of alternative methods and analytical approaches. Alternative methods and analytical approaches must be accepted by the NRC in a license amendment per 10 CFR 50.48(c)(4). Contrary to Section 3.1 of NFPA 805, performance-based methods may be used. (See 10 CFR 50.48(c)(2)(vii)). Note licensees contemplating applying for permission to use an alternative method or analytical approach could pursue a generic approval process with other utilities and/or NEI. See Section 2.4 of this document.

Refer to Appendix L for a process/method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:-

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
- ~~F~~for deviations from the ~~referenced~~ NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 4.1.1, page 21, 1st paragraph:

“For areas of the fire protection program that are not in compliance with NFPA 805, Chapter 3, the licensee may utilize the alternate performance-based methods as long as the method is

NRC Response to FAQ 06-0008, Revision 5 [HXB] {7/19/2007}
Appendix L – Alternative Method for Engineering Analyses

approved by the NRC in a License Amendment. The NRC has taken exception to NFPA 805, Section 3.1 (See 10 CFR 50.48.c (2)(vii)).

Refer to Appendix L for a process/method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
- ~~F~~for deviations from the ~~referenced~~ NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 4.3.1, page 27, add new paragraph to this section at the end

Refer to Appendix L for a process/method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
- ~~F~~for deviations from the ~~referenced~~ NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 4.6.1, page 34 insert new paragraph before last sentence “A sample LAR.....”

Refer to Appendix L for a process/method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
- ~~F~~for deviations from the ~~referenced~~ NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 5.3.1, page 43

“.....Under the risk-informed, performance-based regulatory framework, Fire Protection Program changes will be made without prior NRC approval, except where required by:

- 10 CFR 50.59,
- Other regulatory processes (i.e., Technical Specifications),
- 10CFR 50.48(c) (certain changes to Chapter 3 requirements or Nuclear Safety Changes that do not meet the acceptance criteria of NFPA Section 2.4.4.)
- Changes that have been evaluated using performance-based methods other than those acceptable to the AHJ
- Changes that have been evaluated using performance-based methods other than the approaches in NFPA 805 (i.e., fire modeling and risk evaluation)

Except as noted, in general changes that have been previously approved by the NRC or that do not deviate from a specific NFPA 805 requirement related to systems, methods, or devices need not be submitted for AHJ approval.....”

Section 5.3.2, page 46, starting with 7th paragraph:

“Additional consideration should be given to changes to Fundamental Program Elements and Minimum Design Requirements. 10 CFR 50.48(c)(2)(vii) allows licensees to use performance-based methods to demonstrate compliance with NFPA 805 Chapter 3 requirements. However, these alternate methods must be approved via the license amendment process (10 CFR 50.48(c)(4)).

Refer to Appendix L for a process/method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
- ~~F~~for deviations from the ~~referenced~~ NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.

Most changes to the Fundamental Program Elements and Minimum Design Requirements should not require a License Amendment request, since they are evaluations that demonstrate compliance with requirements of Chapter 3 of NFPA 805. Licensees can deviate from the NFPA standards referenced in NFPA 805 Chapter 3 within the bounds discussed in Appendix L.

Examples of changes that would not require a License Amendment are:

- Replacing a fire rated component (e.g., penetration seal, door, wrap, etc.) with a different component/material having the same or greater fire rating. This does not require a license amendment because it meets the appropriate code.
- Evaluating a blocked sprinkler head(s) for adequate coverage in the area. Chapter 3 of NFPA 805 and the referenced code do not dictate where a sprinkler system should be installed. Therefore the adequacy of the coverage should be evaluated with respect to the nuclear safety component(s) the sprinkler system is protecting.
- Evaluating a broken/missing hanger on a fire suppression system. The acceptability of this deviation can be evaluated to show that the support of the system is still adequate with the broken/missing hanger and is therefore equivalent to a code compliant system as allowed by the code of record.

Conversely, examples of changes that would require a License Amendment are:

- Reducing the number of fire brigade members required on-site to below five.
- Elimination of the Fire Prevention Program at the plant

NFPA 805 Section 4.1, states that, “Deterministic requirements shall be “deemed to satisfy” the performance criteria and require no further engineering analysis.” Chapter 4 of NFPA 805 provides the requirements for the baseline evaluation of the fire protection program’s ability to achieve the performance criteria outlined in Section 1.5 of NFPA 805. The ‘deemed to satisfy’ with out additional engineering analysis does not imply that a Plant Change Evaluation would not be performed. For example if a licensee was changing its current licensing basis in a fire area to a ‘deterministic method’, that change would require a ‘Plant Change Evaluation’. Note the Defense in Depth and Safety Margin portion of the “Plant Change Evaluation” would be satisfied by the fact that a ‘deterministic’ option was chosen for compliance (See Sections 2.4.4.2 and 2.4.4.3 of NFPA 805).”

Appendix I, page I-2 (note: changes are shown to approved FAQ 06-0002, rather than rev. 1 of NEI 04-02).

FIRE PROTECTION PROGRAM FUNDAMENTAL ELEMENT / MINIMUM DESIGN REQUIREMENT CHANGE QUESTIONS

Considering the proposed change, answer the following questions, including a reference to the applicable regulatory, licensing basis, or NFPA document(s), and a brief description of why the proposed change does or does not satisfy the referenced document(s).

3. Does the proposed change involve an **NFPA 805 Chapter 3** requirement as defined in [Insert appropriate document reference]? For those fire protection program changes that involve a Nuclear Safety Compliance Strategy requirement or a Radioactive Release requirement, ensure the effect of the change is evaluated in Appendix I, Sections 1.0 and 2.0, respectively.

- ☐ Yes – Proceed to Question 3.a.
- ☐ No – Document basis and proceed to Question 2

- a. Is the change editorial or trivial in nature? (See Attachment 1)

- o ☐ Yes Document basis and stop.
- o ☐ No Proceed to Question 3.b.

- b. Does the change meet NFPA 805 Chapter 3 requirements or the previously approved Alternative as defined in [Insert appropriate document reference]?

Previously approved alternatives include fire protection engineering analyses that are allowed based upon an approved license amendment described in NEI 04-02, Appendix L. (See Attachment 2)

- o ☐ Yes Document conclusions, complete remaining sections.
- o ☐ No License Amendment Request must be processed for NRC approval. Complete remaining sections.

Appendix I – Attachment 2, page I-8

“Refer to Appendix L for a process/method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements:

- ~~When the Chapter 3 requirements are conditional based upon NFPA 805 Chapter 4; and~~
 - ~~E~~for deviations from the ~~referenced~~ NFPA codes and listings for rated components in NFPA 805.
- Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.

The following are examples of changes that do not require NRC approval:

- Replacing a fire rated component (e.g., fire rated penetration seal, fire door, fire rated wrap, etc.) with a different component having the same or greater fire rating.
 - Use of fire hoses manufactured from a different material.
 - Use of a valve assembly supplied by a different manufacturer for a suppression system.
 - Changes to Fire Brigade Training requirements that do not affect performance.
 - Evaluating a blocked sprinkler head(s) for adequate coverage in the area. Chapter 3 of NFPA 805 and the referenced code do not dictate where a sprinkler system should be installed. Therefore the adequacy of the coverage should be evaluated with respect to the nuclear safety component(s) the sprinkler system is protecting.”
-

PLACEHOLDER FOR A DESCRIPTION OF NRC POSITION ON THIS FAQ.

L.1 Background

10 CFR 50.48(c) requires licensees to submit 10 CFR 50.90 license amendment requests for any changes to Chapter 3 features of NFPA 805, unless they have been previously approved by the NRC. Under the standard license condition of GL 86-10, licensees are allowed to make certain types of changes without prior NRC approval as long as the changes do not adversely affect the plant's ability to safely shutdown in the event of a fire.

To apply this ~~process~~/method, licensees must send the proposed ~~process~~/methods outlined in this Appendix to the NRC for approval. Then, they may use the approved ~~processes~~/methods without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/~~processes~~. Approval of a license amendment for the use of this process would constitute a "previously approved alternative" as discussed in NFPA 805 Section 3.1.

The licensees' ~~process~~/methodology must request an amendment under 10 CFR 50.90, using the flexibility available under 10 CFR 50.48(c)(2)(vii), "Performance-Based Methods", to allow 10 CFR 50.48(c) licensees to establish a process that enables them to make changes to features required by Chapter 3 of NFPA 805, as long as those changes only affect the referenced codes, standards and listings, such as NFPA, Underwriters Laboratory, Inc. or Factory Mutual listings (Note that referenced codes and standards refer to the "code of record" as defined in section 1.8 of NFPA-805. A licensee's code of record may be different than those referenced in NFPA-805). Under the proposal the licensee will commit to a process to evaluate deviations from ~~secondary referenced~~ codes and listings required by NFPA 805 Chapter 3. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

Therefore, application of this ~~process~~/method requires two steps. First, the ~~process~~/methods and bounds of the process must be submitted to the NRC for approval. Second, following approval by the NRC, all plant specific changes made under this license amendment will undergo the same evaluation process as ~~required by part of~~ 10 CFR 50.48(c)(2)(vii). This second step, application of the ~~process~~/method, will not require NRC approval.

This ~~process~~/method would not apply to NFPA 805 Chapter 3 changes that do not relate to either NFPA codes or listings ~~or changes that are not conditional based on NFPA 805 Chapter 4~~. These types of changes would continue to require individual 10 CFR 50.90 license amendment requests addressing the specific deviation.

L.2 Process

Proposed addition to the post-NFPA transition fire protection standard license condition (Section C.3.1 of Regulatory Guide 1.205:

~~“Licensees may perform change evaluations for fundamental fire protection program and design elements of NFPA 805 Chapter 3 that are conditional based on NFPA 805 Chapter 4 requirements.”~~

“Licensees may ~~also~~ perform change evaluations for deviations from the ~~referenced NFPA~~ codes and listings for rated components mentioned in NFPA 805, without a 10 CFR 50.90 submittal, ~~as long as the specific requirement for the feature is not included in NFPA 805 Chapter 3 itself~~, and the NFPA 805 change process is used.”

The following table provides the sections of NFPA 805 that will utilize this process/method. ~~Sections that are addressed conditionally by Chapter 4 performance-based process are also identified for completeness.~~

Column Heading Definition:

Fire Protection Engineering Analysis Process Applicable: Sections of NFPA 805 Chapter 3 containing referenced codes and listings. Note the “Applicability” would only apply to the referenced codes and listings contained within these sections, and the process could not be used to change the NFPA 805 Chapter 3 specific requirements.

~~**Chapter 4 Conditional Section:** These NFPA 805 Chapter 3 sections are conditional based upon NFPA 805 Chapter 4 requirements. The requested use of fire protection engineering evaluations for these sections are not limited to referenced codes and listings.~~

Fire Protection Engineering Analysis ~~and Chapter 4~~ Not Applicable: These NFPA 805 Chapter 3 sections do not have ~~NFPA 805 Chapter 4 conditions and do not have~~ referenced codes and listings. Therefore, the process/method associated with this Appendix is not applicable and would be outside the scope of the associated LAR.

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable
3.1	General		X
3.2	Fire Protection Plan		X
3.2.1	Intent		X
3.2.2	Management Policy Direction and Responsibility		X
3.2.3	Procedures		X
3.3	Prevention		X
3.3.1	Fire Prevention for Operational Activities	X	
3.3.2	Structural	X	
3.3.3	Interior Finishes	X	

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable
3.3.4	Insulation Materials		X
3.3.5	Electrical		X
3.3.6	Roofs	X	
3.3.7	Bulk Flammable Gas Storage	X	
3.3.8	Bulk Storage of Flammable and Combustible Liquids	X	
3.3.9	Transformers		X
3.3.10	Hot Pipes and Surfaces		X
3.3.11	Electrical Equipment (Note 1)		X
3.3.12	Reactor Coolant Pumps (Note 1)		X
3.4	Industrial Fire Brigade		
3.4.1	On-Site Fire Fighting Capability	X	
3.4.2	Pre-Fire Plans		X
3.4.3	Training and Drills	X	
3.4.4	Fire Fighting Equipment	X	
3.4.5	Off-Site Fire Department Interface		X
3.4.6	Communications		X
3.5	Water Supply	X	
3.6	Standpipe and Hose Stations	X	
3.7	Fire Extinguishers	X	
3.11.1	Building Separation (See Note)		X

Note – Section 3.11.1 of NFPA 805 contains an exception for performance-based analysis. The process in this FAQ is not applicable.

L.3 Example

Section 3.6.1 of NFPA 805 requires a hose system to be installed per NFPA 14. Using this process/method, a hose system must be available and have access to “all power block buildings,” and must also be a Class III standpipe, but may deviate from other specific requirements of NFPA 14 if the deviation is evaluated and found to be acceptable using this methodology. These deviations must not contradict other text in Chapter 3 of NFPA 805. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

L.4 Justification

Since this ~~process~~/method will be approved by the NRC as part of the 10 CFR 50.90 submittal, it will meet the legal requirement of 10 CFR 50.48(c)(2)(vii). The basis for the change evaluation being included in the 10 CFR 50.90 submittal will be that each individual change will be evaluated against the NFPA 805 change process (NFPA 805 performance goals / objectives

/criteria, defense-in-depth and safety margins evaluation), and providing this flexibility does not adversely impact the features required by Chapter 3 of NFPA 805 to ensure the NFPA 805 performance goals, performance objectives, and performance criteria are satisfied. By only allowing changes to the **referenced** codes and listings, the changes are bounded. All features required by Chapter 3 will continue to be required (unless specifically addressed separately from this process in an LAR). NFPA-805 Chapter 3 features addressed by referenced codes and standards may be changed based on an evaluation, using the required methods described in this appendix (once reviewed and approved by the NRC in the license amendment) in a similar manner that was previously allowed under the Generic Letter 86-10 license condition, without prior NRC approval.

The method will ensure that the following requirements are met:

10 CFR 50.48(c)(2)(vii) Requirement	Method of Accomplishment
(a) The required NFPA 805 performance goals, performance objectives, and performance criteria are satisfied.	The fire protection engineering analysis process includes the assessment of impact on NFPA 805 performance goals, performance objectives, and performance criteria are satisfied. Impact will be assessed per risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section 3.2.
(b) Safety margins are maintained.	Maintaining safety margins will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section C.3.2.
(c) Fire protection defense-in-depth is maintained.	Maintaining fire protection defense-in-depth will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section C.3.2.

L.5 Conclusion

This ~~process~~/method will permit a risk-informed, performance-based approach to evaluate Fire Protection Program changes to NFPA-805 Chapter 3 ~~features requirements~~ within the bounds of ~~secondary referenced~~ codes and listings ~~or changes that are conditional based on NFPA-805 Chapter 4~~. Following NRC approval of a 10 CFR 50.90 license amendment, this ~~process~~/methodology will permit licensees to evaluate fire protection features without prior NRC approval. Other NFPA-805 Chapter 3 issues, not involving ~~NFPA~~ codes or listings ~~or changes that are not conditional based on NFPA-805 Chapter 4~~, would have to be submitted for NRC approval on a case by case basis.

Attachment 2:

Plant: Harris
Contact: Jeff Ertman

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Distribution: *(NEI Internal Use)*

☒ 805TF ☒ FPWG ☐ RATF ☐ RIRWG ☐ BWROG ☐ PWROG

Purpose of FAQ:

The purpose of FAQ 06-0008 is to provide a method for the use of fire protection engineering analyses post-transition to address NFPA 805 Chapter 3 requirements. Currently, licensees may self approve these evaluations under the existing fire protection license conditions. The method discussed in this FAQ will be submitted for approval as part of the transition license amendment request (LAR). The method to be submitted in the LAR is to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced codes, standards and listings for rated components in NFPA 805.

Post-transition, licensees will use this method to self approve acceptable fire protection engineering analyses.

Is this Interpretation of guidance? ☒ Yes / No

Proposed new guidance not in NEI 04-02? ☒ Yes / No

Details:

NEI 04-02 guidance needing interpretation (include section, paragraph, and line numbers as applicable):

Sections 2.2, 2.3, 2.4, 4.3.1, 4.6.1, 5.3.2, Appendix H, and Appendix I of NEI 04-02 Revision 1.

Circumstances requiring guidance interpretation or new guidance:

Risk-informed, performance-based fire protection engineering analyses are an acceptable alternative to the deterministic approaches in NFPA 805 Chapter 4. Risk-informed, performance-based fire protection engineering analyses may also be needed to document the acceptability of fire protection systems and features addressed in NFPA 805 Chapter 3 sections. Current licensing basis allows flexibility to use performance-based technical analysis per Generic Letter 86-10. An approach using these types of analyses is needed to allow this flexibility following transition to NFPA 805.

Detail contentious points if licensee and NRC have not reached consensus on the facts and circumstances:

The fire protection program elements and minimum design requirements of NFPA 805 Chapter 3 may be subject to the performance-based methods permitted elsewhere in NFPA 805 per 10 CFR 50.48(c)(2)(vii), as long as the appropriate regulatory processes (i.e., a license amendment request) are utilized.

A process for a 10 CFR 50.48(c)(2)(vii) License Amendment Request has not yet been agreed upon.

Potentially relevant existing FAQ numbers:

FAQ 06-0004 includes a process for defining fire protection systems and features required to meet NFPA 805 Chapter 3 criteria.

Response Section:

BACKGROUND

The rulemaking performed to implement 10 CFR 50.48(c) identified the need to be able to utilize performance-based methods on the fundamental fire protection program elements and design requirements in Chapter 3. To address this need, 10 CFR 50.48(c) included a provision that allows licensees to use performance-based methods on Chapter 3 attributes, upon receipt of NRC approval.

Prior to transition, under the standard license condition of GL 86-10, licensees are allowed to make certain types of changes without prior NRC approval as long as the changes do not adversely affect the plant's ability to achieve and maintain safe shutdown in the event of a fire.

Proposed resolution of FAQ and the basis for the proposal:

PROCESS

This FAQ proposes to utilize the NFPA 805 Change Evaluation process as defined in NEI 04-02 (including consideration of Defense-in-Depth and Safety Margins), as the process for determining acceptability for changes to NFPA 805 Chapter 3 requirements that are implemented through referenced codes, standards and listings.

To apply this method, licensees must send the proposed methods outlined in this FAQ (the Change Evaluation process defined in NEI 04-02) to the NRC for approval. Then, they may use the approved method without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods. Approval of a license amendment for the use of this process would constitute a "previously approved alternative" as discussed in NFPA 805 Section 3.1.

The licensee must request an amendment under 10 CFR 50.90, using the flexibility available under 10 CFR 50.48(c)(2)(vii), "Performance-Based Methods". Once approved, the license amendment would allow licensees to make changes to NFPA 805 Chapter 3 requirements, as long as those changes only affect the referenced codes, standards and listings, such as NFPA, Underwriters Laboratory, Inc. or Factory Mutual listings (Note that referenced codes, standards and listings refer to the "code of record" as defined in section 1.8 of NFPA 805. A licensee's code of record may be different than those referenced in NFPA 805). Under the proposal the licensee will commit to a process to evaluate deviations from referenced codes, standards and listings required by NFPA 805 Chapter 3. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

Therefore, application of this method requires two steps. First, the methods and bounds of the process must be submitted to the NRC for approval. Second, following approval by the NRC, all plant specific changes made using the method proposed and approved under this license amendment will undergo the same evaluation process as required by 10 CFR 50.48(c)(2)(vii). This second step, application of the method, will not require NRC approval.

This method would not apply to NFPA 805 Chapter 3 changes that do not refer to codes, standards or listings. These types of changes would continue to require individual 10 CFR 50.90 license amendment requests addressing the specific deviation.

Proposed addition to the post-NFPA transition fire protection standard license condition (Section C.3.1 of Regulatory Guide 1.205):

"Licensees may also perform change evaluations for deviations from the codes, standards and listings referenced in NFPA 805 Chapter 3, without a 10 CFR 50.90 submittal, as long as the specific requirement for the feature is not included in NFPA 805 Chapter 3, and the NFPA 805 change process is used."

The following provides the sections of NFPA 805 that will utilize this method.

Column Heading Definition:

Fire Protection Engineering Analysis Process Applicable: Sections of NFPA 805 Chapter 3 containing referenced codes, standards and listings. Note the "Applicability" would only apply to the referenced codes, standards and listings contained within these sections, and the process could not be used to change the NFPA 805 Chapter 3 specific requirements.

Fire Protection Engineering Analysis Not Applicable: These NFPA 805 Chapter 3 sections do not have referenced codes, standards and listings. Therefore, the process/method associated with this FAQ is not applicable and would be outside the scope of the associated LAR.

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable
3.1	General		X
3.2	Fire Protection Plan		X
3.2.1	Intent		X
3.2.2	Management Policy Direction and Responsibility		X
3.2.3	Procedures		X
3.3	Prevention		X
3.3.1	Fire Prevention for Operational Activities	X	
3.3.2	Structural	X	
3.3.3	Interior Finishes	X	
3.3.4	Insulation Materials		X
3.3.5	Electrical		X
3.3.6	Roofs	X	
3.3.7	Bulk Flammable Gas Storage	X	
3.3.8	Bulk Storage of Flammable and Combustible Liquids	X	
3.3.9	Transformers		X
3.3.10	Hot Pipes and Surfaces		X
3.3.11	Electrical Equipment (Note 1)		X
3.3.12	Reactor Coolant Pumps (Note 1)		X
3.4	Industrial Fire Brigade		
3.4.1	On-Site Fire Fighting Capability	X	
3.4.2	Pre-Fire Plans		X

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process and Chapter 4 Not Applicable
3.4.3	Training and Drills	X	
3.4.4	Fire Fighting Equipment	X	
3.4.5	Off-Site Fire Department Interface		X
3.4.6	Communications		X
3.5	Water Supply	X	
3.6	Standpipe and Hose Stations	X	
3.7	Fire Extinguishers	X	
3.11.1	Building Separation (Note)		X

Note – Section 3.11.1 of NFPA 805 contains an exception for performance-based analysis. The process in this FAQ is not applicable.

EXAMPLE

Section 3.6.1 of NFPA 805 requires a hose system to be installed per NFPA 14. Using this method, a hose system must be available and have access to “all power block buildings,” and must also be a Class III standpipe, but may deviate from other specific requirements of NFPA 14 if the deviation is evaluated and found to be acceptable using this methodology. These deviations must not contradict other text in Chapter 3 of NFPA 805. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

JUSTIFICATION

Since this method will be approved by the NRC as part of the 10 CFR 50.90 submittal, it will meet the legal requirement of 10 CFR 50.48(c)(2)(vii). The basis for the change evaluation to be included in the 10 CFR 50.90 submittal will be that each individual change will be evaluated against the NFPA 805 change process (NFPA 805 performance goals / objectives / criteria, defense-in-depth and safety margins evaluation), and providing this flexibility does not adversely impact the features required by Chapter 3 of NFPA 805 to ensure the NFPA 805 performance goals, performance objectives, and performance criteria are satisfied. By only allowing changes to NFPA 805 Chapter 3 referenced codes, standards and listings, the changes are bounded. All features required by Chapter 3 will continue to be required (unless specifically addressed separately from this process in an LAR). NFPA 805 Chapter 3 requirements addressed by referenced codes, standards and listings may be changed based on an evaluation, using the required methods described in this FAQ (once reviewed and approved by the NRC in the license amendment) in a similar manner as is currently allowed under the Generic Letter 86-10 license condition, without prior NRC approval.

The method will ensure that the following requirements are met:

10 CFR 50.48(c)(2)(vii) Requirement	Method of Accomplishment
(a) The required NFPA 805 performance goals, performance objectives, and performance criteria are satisfied.	The fire protection engineering analysis process includes the assessment of impact on NFPA 805 performance goals, performance objectives, and performance criteria. Impact will be assessed per risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section 3.2.
(b) Safety margins are maintained.	Maintaining safety margins will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section C.3.2.
(c) Fire protection defense-in-depth is maintained.	Maintaining fire protection defense-in-depth will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section C.3.2.

CONCLUSION

This process/method will permit a risk-informed, performance-based approach to evaluate Fire Protection Program changes to features required by NFPA 805 Chapter 3 within the bounds of referenced codes, standards and listings. Following NRC approval of a 10 CFR 50.90 license amendment, this methodology will permit licensees to evaluate Chapter 3 fire protection features in referenced codes, standards and listings without prior NRC approval. Other NFPA 805 Chapter 3 issues not involving codes, standards or listings, would have to be submitted for NRC approval on a case by case basis.

If appropriate, provide proposed rewording of guidance for inclusion in the next Revision:

[See attached proposed revision to NEI 04-02]

DRAFT

Appendix L – Alternative Method for Engineering Analyses

Section 2.2, page 7, 3rd paragraph:

- **Performance-Based Methods, § 50.48(c)(2)(vii)** - The prohibition in Section 3.1 of NFPA 805 that does not permit the use of performance-based methods for the Chapter 3 fundamental fire protection program elements and minimum design criteria is not endorsed. The NRC takes this exception in order to provide licensees greater flexibility in meeting the fire protection program elements and minimum design requirements of Chapter 3 by the use of performance-based methods (including the use of risk-informed methods) described in the NFPA 805 standard. Licensees who wish to deviate from Chapter 3 requirements must submit a license amendment request for NRC approval.

Refer to Appendix L for a method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.

Section 2.3, page 9, 2nd paragraph:

“Compliance with Chapter 3 of NFPA 805 may be demonstrated by showing that the specific requirements are met either directly or by the use of alternative methods and analytical approaches. Alternative methods and analytical approaches must be accepted by the NRC in a license amendment per 10 CFR 50.48(c)(4). Contrary to Section 3.1 of NFPA 805, performance-based methods may be used. (See 10 CFR 50.48(c)(2)(vii)). Note licensees contemplating applying for permission to use an alternative method or analytical approach could pursue a generic approval process with other utilities and/or NEI. See Section 2.4 of this document.

Refer to Appendix L for a method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 4.1.1, page 21, 1st paragraph:

“For areas of the fire protection program that are not in compliance with NFPA 805, Chapter 3, the licensee may utilize the alternate performance-based methods as long as the method is

Appendix L – Alternative Method for Engineering Analyses

approved by the NRC in a License Amendment. The NRC has taken exception to NFPA 805, Section 3.1 (See 10 CFR 50.48.c (2)(vii)).

Refer to Appendix L for a method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 4.3.1, page 27, add new paragraph to this section at the end

Refer to Appendix L for a method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 4.6.1, page 34 insert new paragraph before last sentence “A sample LAR.....”

Refer to Appendix L for a method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.”

Section 5.3.1, page 43

“.....Under the risk-informed, performance-based regulatory framework, Fire Protection Program changes will be made without prior NRC approval, except where required by:

Appendix L – Alternative Method for Engineering Analyses

- 10 CFR 50.59,
- Other regulatory processes (i.e., Technical Specifications),
- 10CFR 50.48(c) (certain changes to Chapter 3 requirements or Nuclear Safety Changes that do not meet the acceptance criteria of NFPA Section 2.4.4.)
- Changes that have been evaluated using performance-based methods other than those acceptable to the AHJ
- Changes that have been evaluated using performance-based methods other than the approaches in NFPA 805 (i.e., fire modeling and risk evaluation)

Except as noted, in general changes that have been previously approved by the NRC or that do not deviate from a specific NFPA 805 requirement related to systems, methods, or devices need not be submitted for AHJ approval.....”

Section 5.3.2, page 46, starting with 7th paragraph:

“Additional consideration should be given to changes to Fundamental Program Elements and Minimum Design Requirements. 10 CFR 50.48(c)(2)(vii) allows licensees to use performance-based methods to demonstrate compliance with NFPA 805 Chapter 3 requirements. However, these alternate methods must be approved via the license amendment process (10 CFR 50.48(c)(4)).

Refer to Appendix L for a method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.

Most changes to the Fundamental Program Elements and Minimum Design Requirements should not require a License Amendment request, since they are evaluations that demonstrate compliance with requirements of Chapter 3 of NFPA 805. Licensees can deviate from the NFPA standards referenced in NFPA 805 Chapter 3 within the bounds discussed in Appendix L.

Examples of changes that would not require a License Amendment are:

- Replacing a fire rated component (e.g., penetration seal, door, wrap, etc.) with a different component/material having the same or greater fire rating. This does not require a license amendment because it meets the appropriate code.
- Evaluating a blocked sprinkler head(s) for adequate coverage in the area. Chapter 3 of NFPA 805 and the referenced code do not dictate where a sprinkler system should be installed. Therefore the adequacy of the coverage should be evaluated with respect to the nuclear safety component(s) the sprinkler system is protecting.
- Evaluating a broken/missing hanger on a fire suppression system. The acceptability of this deviation can be evaluated to show that the support of the system is still adequate with the broken/missing hanger and is therefore equivalent to a code compliant system as allowed by the code of record.

Conversely, examples of changes that would require a License Amendment are:

- Reducing the number of fire brigade members required on-site to below five.
- Elimination of the Fire Prevention Program at the plant

Appendix L – Alternative Method for Engineering Analyses

NFPA 805 Section 4.1, states that, “Deterministic requirements shall be “deemed to satisfy” the performance criteria and require no further engineering analysis.” Chapter 4 of NFPA 805 provides the requirements for the baseline evaluation of the fire protection program’s ability to achieve the performance criteria outlined in Section 1.5 of NFPA 805. The ‘deemed to satisfy’ with out additional engineering analysis does not imply that a Plant Change Evaluation would not be performed. For example if a licensee was changing its current licensing basis in a fire area to a ‘deterministic method’, that change would require a ‘Plant Change Evaluation’. Note the Defense in Depth and Safety Margin portion of the “Plant Change Evaluation” would be satisfied by the fact that a ‘deterministic’ option was chosen for compliance (See Sections 2.4.4.2 and 2.4.4.3 of NFPA 805).”

Appendix L – Alternative Method for Engineering Analyses

Appendix I, page I-2 (note: changes are shown to approved FAQ 06-0002, rather than rev. 1 of NEI 04-02).

FIRE PROTECTION PROGRAM FUNDAMENTAL ELEMENT / MINIMUM DESIGN REQUIREMENT CHANGE QUESTIONS

Considering the proposed change, answer the following questions, including a reference to the applicable regulatory, licensing basis, or NFPA document(s), and a brief description of why the proposed change does or does not satisfy the referenced document(s).

3. Does the proposed change involve an **NFPA 805 Chapter 3** requirement as defined in **[Insert appropriate document reference]**? For those fire protection program changes that involve a Nuclear Safety Compliance Strategy requirement or a Radioactive Release requirement, ensure the effect of the change is evaluated in Appendix I, Sections 1.0 and 2.0, respectively.

- ☐ Yes – Proceed to Question 3.a.
- ☐ No – Document basis and proceed to Question 2

- a. Is the change editorial or trivial in nature? (See Attachment 1)

- o ☐ Yes Document basis and stop.
- o ☐ No Proceed to Question 3.b.

- b. Does the change meet NFPA 805 Chapter 3 requirements or the previously approved Alternative as defined in [Insert appropriate document reference]?

Previously approved alternatives include fire protection engineering analyses that are allowed based upon an approved license amendment described in NEI 04-02, Appendix L. (See Attachment 2)

- o ☐ Yes Document conclusions, complete remaining sections.
- o ☐ No License Amendment Request must be processed for NRC approval. Complete remaining sections.

Appendix L – Alternative Method for Engineering Analyses

Appendix I – Attachment 2, page I-8

Refer to Appendix L for a method to be submitted in the transition LAR to allow fire protection engineering analyses to address NFPA 805 Chapter 3 requirements for deviations from the referenced NFPA codes and listings for rated components in NFPA 805.

Approval of a license amendment for the use of this process would constitute a “previously approved alternative” that would allow the use of this process without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods/processes.

The following are examples of changes that do not require NRC approval:

- Replacing a fire rated component (e.g., fire rated penetration seal, fire door, fire rated wrap, etc.) with a different component having the same or greater fire rating.
 - Use of fire hoses manufactured from a different material.
 - Use of a valve assembly supplied by a different manufacturer for a suppression system.
 - Changes to Fire Brigade Training requirements that do not affect performance.
 - Evaluating a blocked sprinkler head(s) for adequate coverage in the area. Chapter 3 of NFPA 805 and the referenced code do not dictate where a sprinkler system should be installed. Therefore the adequacy of the coverage should be evaluated with respect to the nuclear safety component(s) the sprinkler system is protecting.”
-

Appendix L – Alternative Method for Engineering Analyses
PLACEHOLDER FOR A DESCRIPTION OF NRC POSITION ON THIS FAQ.

L.1 Background

10 CFR 50.48(c) requires licensees to submit 10 CFR 50.90 license amendment requests for any changes to Chapter 3 features of NFPA 805, unless they have been previously approved by the NRC. Under the standard license condition of GL 86-10, licensees are allowed to make certain types of changes without prior NRC approval as long as the changes do not adversely affect the plant's ability to safely shutdown in the event of a fire.

To apply this method, licensees must send the proposed methods outlined in this Appendix to the NRC for approval. Then, they may use the approved methods without prior approval for specific applications, as long as the application is within the bounds of NRC approval of the proposed methods. Approval of a license amendment for the use of this process would constitute a "previously approved alternative" as discussed in NFPA 805 Section 3.1.

The licensees' methodology must request an amendment under 10 CFR 50.90, using the flexibility available under 10 CFR 50.48(c)(2)(vii), "Performance-Based Methods", to allow 10 CFR 50.48(c) licensees to establish a process that enables them to make changes to features required by Chapter 3 of NFPA 805, as long as those changes only affect the referenced codes, standards and listings, such as NFPA, Underwriters Laboratory, Inc. or Factory Mutual listings (Note that referenced codes and standards refer to the "code of record" as defined in section 1.8 of NFPA-805. A licensee's code of record may be different than those referenced in NFPA-805). Under the proposal the licensee will commit to a process to evaluate deviations from referenced codes and listings required by NFPA 805 Chapter 3. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

Therefore, application of this method requires two steps. First, the methods and bounds of the process must be submitted to the NRC for approval. Second, following approval by the NRC, all plant specific changes made under this license amendment will undergo the same evaluation process as required by 10 CFR 50.48(c)(2)(vii). This second step, application of the method, will not require NRC approval.

This method would not apply to NFPA 805 Chapter 3 changes that do not relate to either NFPA codes or listings.

These types of changes would continue to require individual 10 CFR 50.90 license amendment requests addressing the specific deviation.

L.2 Process

Proposed addition to the post-NFPA transition fire protection standard license condition (Section C.3.1 of Regulatory Guide 1.205:

Appendix L – Alternative Method for Engineering Analyses

“Licensees may perform change evaluations for deviations from the referenced codes and listings for rated components mentioned in NFPA 805, without a 10 CFR 50.90 submittal, and the NFPA 805 change process is used.”

The following table provides the sections of NFPA 805 that will utilize this process/method.

Column Heading Definition:

Fire Protection Engineering Analysis Process Applicable: Sections of NFPA 805 Chapter 3 containing referenced codes and listings. Note the “Applicability” would only apply to the referenced codes and listings contained within these sections, and the process could not be used to change the NFPA 805 Chapter 3 specific requirements.

Fire Protection Engineering Analysis Not Applicable: These NFPA 805 Chapter 3 sections do not have referenced codes and listings. Therefore, the process/method associated with this Appendix is not applicable and would be outside the scope of the associated LAR.

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable
3.1	General		X
3.2	Fire Protection Plan		X
3.2.1	Intent		X
3.2.2	Management Policy Direction and Responsibility		X
3.2.3	Procedures		X
3.3	Prevention		X
3.3.1	Fire Prevention for Operational Activities	X	
3.3.2	Structural	X	
3.3.3	Interior Finishes	X	

Appendix L – Alternative Method for Engineering Analyses

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable
3.3.4	Insulation Materials		X
3.3.5	Electrical		X
3.3.6	Roofs	X	
3.3.7	Bulk Flammable Gas Storage	X	
3.3.8	Bulk Storage of Flammable and Combustible Liquids	X	
3.3.9	Transformers		X
3.3.10	Hot Pipes and Surfaces		X
3.3.11	Electrical Equipment (Note 1)		X
3.3.12	Reactor Coolant Pumps (Note 1)		X
3.4	Industrial Fire Brigade		
3.4.1	On-Site Fire Fighting Capability	X	
3.4.2	Pre-Fire Plans		X
3.4.3	Training and Drills	X	
3.4.4	Fire Fighting Equipment	X	
3.4.5	Off-Site Fire Department Interface		X
3.4.6	Communications		X
3.5	Water Supply	X	
3.6	Standpipe and Hose Stations	X	
3.7	Fire Extinguishers	X	
3.11.1	Building Separation (See Note)		X

Note – Section 3.11.1 of NFPA 805 contains an exception for performance-based analysis. The process in this FAQ is not applicable.

L.3 Example

Section 3.6.1 of NFPA 805 requires a hose system to be installed per NFPA 14. Using this process/method, a hose system must be available and have access to “all power block buildings,” and must also be a Class III standpipe, but may deviate from other specific requirements of NFPA 14 if the deviation is evaluated and found to be acceptable using this methodology. These deviations must not contradict other text in Chapter 3 of NFPA 805. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria are satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

L.4 Justification

Since this method will be approved by the NRC as part of the 10 CFR 50.90 submittal, it will meet the legal requirement of 10 CFR 50.48(c)(2)(vii). The basis for the change evaluation being included in the 10 CFR 50.90 submittal will be that each individual change will be evaluated against the NFPA 805 change process (NFPA 805 performance goals / objectives

Appendix L – Alternative Method for Engineering Analyses

/criteria, defense-in-depth and safety margins evaluation), and providing this flexibility does not adversely impact the features required by Chapter 3 of NFPA 805 to ensure the NFPA 805 performance goals, performance objectives, and performance criteria are satisfied. By only allowing changes to the referenced codes and listings, the changes are bounded. All features required by Chapter 3 will continue to be required (unless specifically addressed separately from this process in an LAR). NFPA-805 Chapter 3 features addressed by referenced codes and standards may be changed based on an evaluation, using the required methods described in this appendix (once reviewed and approved by the NRC in the license amendment) in a similar manner that was previously allowed under the Generic Letter 86-10 license condition, without prior NRC approval.

The method will ensure that the following requirements are met:

Appendix L – Alternative Method for Engineering Analyses

10 CFR 50.48(c)(2)(vii) Requirement	Method of Accomplishment
(a) The required NFPA 805 performance goals, performance objectives, and performance criteria are satisfied.	The fire protection engineering analysis process includes the assessment of impact on NFPA 805 performance goals, performance objectives, and performance criteria are satisfied. Impact will be assessed per risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section 3.2.
(b) Safety margins are maintained.	Maintaining safety margins will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section C.3.2.
(c) Fire protection defense-in-depth is maintained.	Maintaining fire protection defense-in-depth will be ensured using the risk-informed, performance-based change process in NEI 04-02 Chapter 5 and Appendices I and J as endorsed by RG 1.205 Section C.3.2.

Appendix L – Alternative Method for Engineering Analyses

L.5 Conclusion

This method will permit a risk-informed, performance-based approach to evaluate Fire Protection Program changes to NFPA-805 Chapter 3 requirements within the bounds of referenced codes and listings. Following NRC approval of a 10 CFR 50.90 license amendment, this methodology will permit licensees to evaluate fire protection features without prior NRC approval. Other NFPA-805 Chapter 3 issues, not involving codes or listings, would have to be submitted for NRC approval on a case by case basis.

DRAFT

Chuck -

When you get a chance please forward the NRC reviewer assignments to me so I can include on FAQ Log

thanks

Liz

Elizabeth Kleinsorg

Managing Partner

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text messaging <<mailto:7046515548@vtext.com>> [7046515548@vtext.com](tel:7046515548)

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Group Extranet (Fire Protection Documents)

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Subject: NRC Reviewer Assignments
Creation Date 7/19/2007 6:27:45 PM
From: "Liz Kleinsorg" <ekleinsorg@haifire.com>

Created By: ekleinsorg@haifire.com

Recipients

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Mime.822	7075	

Options

Expiration Date: None
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ReplyRequested: No
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Junk Mail Handling Evaluation Results

Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered

Junk Mail handling disabled by User

Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled

Liz,

Here is the matrix of FP lead assignments as of this moment.

Chuck

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>>> "Liz Kleinsorg" <ekleinsorg@haifire.com> 7/19/2007 6:27 PM >>>

Chuck -

When you get a chance please forward the NRC reviewer assignments to me so I can include on FAQ Log

thanks

Liz

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haifire.com 8:38:36 AM ekleinsorg (Liz Kleinsorg)	Transferred	7/20/2007

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Attachment 1:

FAQ Number	AFPB Technical Leads
06-0001	Bob Radlinski
06-0002	Bob Radlinski
06-0003	Bob Radlinski
06-0004	Dan Frumkin
06-0005	Harry Barrett
06-0006	Thinh Dinh
06-0007	Chuck Moulton
06-0008	Harry Barrett
06-0011	Harry Barrett
06-0012	Phil Qualls
06-0016	Naeem Iqbal
06-0017	Ray Gallucci
06-0018	Ray Gallucci
06-0019	Thinh Dinh
06-0020	Thinh Dinh
06-0021	Thinh Dinh
06-0022	Chuck Moulton
06-0023	Naeem Iqbal
06-0024	Daniele Oudinot
06-0025	Peter Barbadoro
06-0026	Daniele Oudinot
06-0027	Harry Barrett
06-0028	Daniele Oudinot
07-0031	Ray Gallucci
07-0032	Harry Barrett
07-0033	Dan Frumkin
07-0035	Thinh Dinh

Chuck,

Please find the attached FAQ Log for July. If you have any questions please let me know.

Thank you,

Brandon

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Project Manager, Engineering

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Attachment 1:

FAQ #	Revision	Name	Summary	Actions and Notes	Priority	Submitter		Reviewer	Status			ML #	Approval	
						Plant	Licensee Contact		NEI TF	NRC	Submittal Date		Tentative	Memo
06-0001	0	Alternate method for Engineering Evaluations	Add in clarification that fire affected train manual actions are 'allowed' and therefore do not require evaluation.	NRC rejected the statements regarding SER approval without Exemptions Tentatively approved. Superseded by FAQ 06-0012	Closed	Harris Nuclear Plant	Ertman		Submitted to NRC	Closed	Rev 0 - 4/25/2006	ML061440419	WITHDRAWN 12/14/06 ML063480169	WITHDRAWN 12/14/06 ML063480169
06-0002	1c	NEI 04-02 Section 5.3.3 and App. I, Order of Questions for Change Analysis Screening	Change Figure 5-1, text, and Appendix I to ask the Chapter 4 questions before Chapter 3 questions. NRC added 'included required recovery actions to text of 5.3.3 and added 'including Human actions' to Question 4.e of Change Analysis Form Task Force agrees to first request. Task force is evaluating the addition of NRC rejected the statements regarding SER approval without Exemptions Committed to revise based on RIS 2006-10 and NRC Public Meeting June 9, 2006. See RIS 2006-12 'human actions' to the risk screening questions. - tentatively approved - will resubmit 10/26/06		Closed	Harris Nuclear Plant	Ertman	Gallucci	Submitted to NRC	Closed	Rev 0 - 04/25/2006 Rev 1 - 10/26/2006 Rev 2 - 01/04/2007	ML061440420 ML063170357 ML063350515	CLOSED 01/04/07 ML070030276	APPROVED 01/04/07 ML070030276
06-0003	1b	Change Analysis Screening	Change 'greater than minimal' to 'potentially greater than minimal'		Closed	Harris Nuclear Plant	Ertman	Radlinski	Submitted to NRC	Closed	Rev 0 - 04/25/2006 Rev 1 - 10/26/2006	ML061440422 ML063170355	CLOSED 01/04/07 ML070030242	APPROVED 01/04/07 ML070030242
06-0004	0	Clarify NFPA 805 Chapter 4 and 3 relationship for 'required' FP systems/features	How fire protection systems and features transition is highly dependent on how they are 'required' to meet the nuclear safety criteria of Chapter 4.	Note NRC was using NEI 04-02 Revision 2H figures and not figures in FAQ 06-0004 NRC to re-review in appropriate context & provide status on 10/26/06 Received NRC comments 11/29/06. Resubmitted to NRC and returned with comments. Currently under TF review.	M	HNP	Began Miskiewicz	Frumkin	TF to resubmit in conjunction w/ B.3 tables	Comments provided on R0	Rev 0 - 05/12/2006	ML061440430		
06-0005	1	Guidance on FPP-related changes	NEI 04-02 does not provide guidance what should be considered a FPP-related change or not. Since failure to obtain NRC pre-approval for using risk reductions from a non-FPP related change would be contrary to the guidance in RG 1.205, additional guidance should be provided to clarify what is considered a FPP-related change once NFPA 805 is implemented.	FAQ has been revised. Resubmit to NRC 11/30/06 - waiting for NRC response as of June 07 NRC tentatively scheduling comments for July meeting	H	HNP	Ertman	Barrett	TF waiting for NRC comments	Plan to comment	Rev 0 - 08/24/2006 Rev 1 - 11/30/2006	ML062350095 ML063180544		
06-0006	2	High-low pressure interface definition and NEI 00-01/NFPA 805 discrepancies	Definition of High-Low Pressure Interface is not consistent between NFPA 805 and NEI 00-01. Need to provide clarification.	Received NRC comments on R1, R2 Resubmit 12/19/06 - Definition change per NRC request. Closure process has begun. Draft closure letter was commented on by TF. NRC accepted TF clarification.	Closed	Duke	Barrett	Dinh		Draft closure letter issued	Rev 0 - 08/22/2006 Rev 1 - 10/26/2006 Rev 2 - 12/19/2006	ML062350109 ML063170360 ML063540308	CLOSED 03/12/07 ML070030117	APPROVED 03/12/07 ML070030117
06-0007	3	NFPA 805 Chapter 3 Requirements for Fire Brigades	Need clarification on when NFPA 600 or NFPA 1500 apply. Also clarify if requirements apply to interior structural fire fighting brigade.	FAQ to be revised to mark up NEI 04-02 to show the addition of an appendix for NFPA 805 clarifications. NRC R2 comments by May 07	Closed	HNP	Holder	Moulton	R3 submitted to NRC	Comments provided on R2	Rev 0 - 08/22/2006 Rev 1 - 12/19/2006 Rev 2 - 02/15/2007 Rev 3 - 05/21/2007	ML062350121 ML070030325 ML070510442 ML071550408	CLOSED 6/21/07 ML071940375	

FAQ #	Revision	Name	Summary	Actions and Notes	Priority	Submitter		Reviewer	Status			ML #	Approval	
						Plant	Licensee Contact		NEI TF	NRC	Submittal Date		Tentative	Memo
06-0008	5	Alternate method for Engineering Evaluations	Many Generic Letter 86-10 evaluations exist at facilities today. Transition of these existing evaluations is essential for the success of the Pilot Plants. In addition the use of engineering evaluations for Chapter 3 issues post transition needs to be clarified.	Presented 9/28/06 Comments received from NRC on 11/29/06. Clarification call scheduled. Resubmit to NRC by 02/07 R4a comments received and will incorporate NRC recommendations. R5 by early May. NRC stated at last meeting they would be submitting additional comments. Awaiting NRC comments. Last round of staff comments - attempting to resolve by July	H	NEI	Ratchford	Barrett	R6 planned	Comments provided on R5	Rev 0 - 09/20/2006 Rev 1 - 02/15/2007 Rev 2 - 03/20/2007 Rev 3 - 03/30/2007 Rev 3, Att - 03/30/2007 Rev 4 - 04/09/2007 Rev 5a - 05/08/2007	ML062860250 ML070510499 ML070800007 ML071020160 ML071020169 ML071080099 ML071340180		
06-0009		NEI 04-02 Typo Corrections	Editorial changes to NEI 04-02	Will submit with overall revision at end of year.	L	NEI	Kleinsorg							
06-0010		Incorporate Regulatory Guide 1.205 Baseline concept into NEI 04-02	Based on changes to Regulatory Guide 1.205, NEI 04-02 needs to reflect the baseline risk	Projected submittal 3Q 2007	L	HNP	Ertman							
06-0011	1b	Clarify III.G.3 Compliance Transition	Alternative Shutdown is not specifically addressed in NFPA 805.	Approved by Task Force Reviewers. Submitted to NRC 9/28/06. Under NRC review. Comments received from NRC on 11/29/06. Need time for TF review. Rewrite w/consideration for NRC comment #2 - Resubmit Feb. '07. Awaiting NRC closure. Attempting to provide comments by August	H	NEI	Jutras	Barrett	TF waiting for NRC comments on R1b	Comments provided on R0	Rev 0 - 09/28/2006 Rev 1b - 02/15/2007	ML062890271 ML070510505		
06-0012	4	Clarify Manual Action Transition in Appendix B	Some manual actions are either allowed by the current regulation or have been	Submitted to NRC 9/28/06. Resubmit 10/26/06 as combined with FAQ 06-0001 Comments received from NRC on 11/30/06. With TF for review. Revision by May '07. NRC comments on R2b warrant R3. Will have by May 07 Additional internal comments to be included in new FAQ Awaiting NRC final comments/closure.	Closed	NEI	Kleinsorg	Qualls	R4 submitted to NRC	Comments provided on R2b	Rev 0 - 08/17/2006 Rev 1 - 10/26/2006 Rev 2 - 03/22/2007 Rev 3 - 05/17/2007 Rev 4 - 03/22/2007	ML062860255 ML063170362 ML070805010 ML071380229 ML071570260	CLOSED 6/21/07 ML071940375	
06-0013		Clarify Chapter 4 Methodology Transition Process Bases on Pilot Plant Results		Will be presented at 2007 HNP Pilot meeting. Duke to submit end of Second Quarter 2007 Superceded by FAQ 07-0039	L	HNP	Ertman							
06-0014		Cumulative Risk	Regulatory Guide 1.205 requires tracking of changes to assess cumulative risk. NEI 04-02 does not provide guidance on this issue	With FPRA TF for comment - 12/14/06 FAQ by 4Q 2007	L	HNP	Miskiewicz		FPRA TF has action					
06-0015		Guidance on not-red determination	Process for determining if non-compliances found during the transition process are 'not red' needs to be simplified.	Sent to Task Force for review 11/30/06 With FPRA TF for review 12/14/06 Ken Heffner to provide regulatory input to this FAQ by 12/14/06 Amir Afzali to provide PRA screening criteria for 'not red' determination by 12/14/06 Amir Afzali to discuss with PRA Task Force to increase focus Jim Masterlark to provide revision to Task Force. Task Force to decide on withdrawing this FAQ	H	NEI	Masterlark		FPRA TF has action					

FAQ #	Revision	Name	Summary	Actions and Notes	Priority	Submitter		Reviewer	Status			ML #	Approval	
						Plant	Licensee Contact		NEI TF	NRC	Submittal Date		Tentative	Memo
06-0016	1	Ignition Source counting guidance for Electrical Cabinets	Clarification/enhancement of Ignition Source counting guidance for Electrical Cabinets in NUREG/CR-6850, supporting NFPA-805 Fire PRA application.	Presented at November 2006 pilot meeting Submitted to Task Force 11/30/06. Comments from Task Force to initiator by 12/14/06 Submitted to NRC 12/19/06 Preliminary verbal comments provided by NRC. Potential disagreement on the examples provided in the FAQ were discussed by Ray Gallucci of the NRC. Kiang Zee provided feedback that the examples were intended to be taken collectively and were intended to be drawn to scale. Reviewed at 05/17/07 NEI Meeting - Scheduled for closure at public meeting.	Closed	HNP	Miskiewicz	Iqbal	Submitted R1 to NRC	R1 accepted. Closed	Rev 0 - 12/19/2006 Rev 1 - 03/22/2007	ML070030348 ML071020174	CLOSED 5/17/07 ML071510425	
06-0017	2	Ignition Source counting guidance for High Energy Arcing Faults (HEAF)	Clarification/enhancement of Ignition Source counting guidance for High Energy Arcing Faults (HEAF) in NUREG/CR-6850, supporting NFPA-805 Fire PRA application.	Presented at November 2006 pilot meeting Submitted to Task Force 11/30/06. Comments from Task Force to initiator by 12/14/06 Submitted to NRC 12/19/06 Preliminary verbal comments provided by NRC. Preliminary comments indicated a recommending splitting of HEAFs into a low voltage and high voltage bins. In addition, a new frequency is being considered for bus ducts. Reviewed at 06/21/07 NEI Meeting - NRC stated that this FAQ is considered CLOSED.	Closed	HNP	Miskiewicz	Gallucci	Submitted R2 to NRC	Comments provided on R1	Rev 0 - 12/19/2006 Rev 1 - 05/15/2007 Rev 2 - 06/01/2007	ML070030383 ML071350432 ML071570255	CLOSED 6/21/07 ML071940375	
06-0018	1	Ignition Source counting guidance for Main Control Board (MCB)	Clarification/enhancement of Ignition Source counting guidance for Main Control Board (MCB) in NUREG/CR-6850, supporting NFPA-805 Fire PRA application	Presented at November 2006 pilot meeting Submitted to Task Force 11/30/06. Comments from Task Force to initiator by 12/14/06 Submitted to NRC 12/19/06 Preliminary verbal comments provided by NRC. Preliminary comments indicated more focus on counting just "horseshoe" cabinets as MCBs.	Closed	HNP	Miskiewicz	Gallucci	Submitted R1 to NRC	R1 accepted. Closed	Rev 0 - 11/06/2006 Rev 1 - 03/22/2007	ML070030427 ML071020181	CLOSED 5/17/07 ML071510425	
06-0019	1	Define "power block" and "plant"	Define where used in Chapter 3, "power block" and "plant" are intended to mean "areas in which a fire could jeopardize the ability to meet the performance criteria described in section 1.5." 3.3.1.2 Control of Combustible Materials (1)Wood used within the power block shall be listed pressure-impregnated or coated with a listed fire-retardant application. Exception: Cribbing timbers 6 in. by 6 in. (15.2 cm by 15.2 cm) or larger shall not be required to be fire-retardant treated.	Presented to Task Force 11/30/06 Comments from Task Force to initiator by 12/14/06 Submitted to NRC 12/19/06 Comments to be provided by NRC prior to Feb. 2007 meeting. TF will submit new revision by May 2007 NRC concerned about broadness of definition (e.g., Turbine building may not be included in this definition)	H	HNP	Holder	Dinh	R1 submitted to NRC	Comments provided on R0	Rev 0 - 11/30/2006 Rev 1 - 05/08/2007	ML070030437 ML071340184		
06-0020	1	Definition of "applicable"	(6) Controls on use and storage of flammable gases shall be in accordance with applicable NFPA standards.	Presented to Task Force 11/30/06 CLOSED 5/17/07	Closed	HNP	Holder	Dinh	R1 submitted to NRC	Comments provided on R0	Rev 0 - 11/30/2006 Rev 1 - 05/08/2007	ML070030443 ML071340188	CLOSED 5/17/07 ML071510425	

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06-0021	1a	Clarify that air drops are acceptable.	3.3.5.2 - Only metal tray and metal conduits shall be used for electrical raceways. Thin wall metallic tubing shall not be used for power, instrumentation, or control cables. Flexible metallic conduits shall only be used in short lengths to connect components. HNP as well as other plants have exposed cable drops ~ 3' in length.	Presented to Task Force 11/30/06 CLOSED 5/17/07	Closed	HNP	Holder	Dinh	R1 submitted to NRC	Comments provided on R0	Rev 0 - 12/19/2006 Rev 1 - 05/08/2007	ML070030457 ML071340192	CLOSED 5/17/07 ML071510425	
06-0022	0	Identify a list of typical flame propagation tests which are considered acceptable.	3.3.5.3 - Electric cable construction shall comply with a flame propagation test as acceptable to the AHJ.	Presented to Task Force 11/30/06 Comments from Task Force to initiator by 12/14/06 Submitted to NRC 12/19/06 Preliminary verbal comments provided by NRC. Additional info on applicability of test requested by NRC. Received NRC Review (7/19/07). Initiator reviewing - submittal to Task force by 7/27/07	M	ANO	Puckett	Moulton	TF waiting for NRC comments	Plan to comment	Rev 0 - 12/19/2006	ML070030459		
06-0023	0	Grant exception for Diesel Generator Day Tanks located within Diesel Generator Buildings.	3.3.8 Bulk Storage of Flammable and Combustible Liquids - Bulk storage of flammable and combustible liquids shall not be permitted inside structures containing systems, equipment, or components important to nuclear safety. As a minimum, storage and use shall comply with NFPA 30, Flammable and Combustible Liquids Code.	Presented to Task Force 11/30/06 Submitted to NRC 12/19/06 NRC questioned if issue warranted a FAQ since it is part of plant systems WITHDRAWN 5/17/07	L	HNP	Holder	Iqbal	WITHDRAWN 5/17/07	Proposed withdraw	Rev 0 - 12/19/2006	ML070030470	Withdrawn 5/17/07 ML071510425	
06-0024	0	Define what "adequate clearance" is.	3.3.11 Electrical Equipment - Adequate clearance, free of combustible material, shall be maintained around energized electrical equipment. Need to provide a clearer definition of 'adequate clearance'. Could be based on OSHA 3ft requirement.	Presented to Task Force 11/30/06 Submitted to NRC 12/19/06 Preliminary verbal comments provided by NRC. Initiator resubmitted to Task Force planned submittal to NRC first week of July Discussed with Task Force (7/19/07), initiator to resubmit by 8/10/07	M	HNP	Holder	Oudinot	TF reviewing R1, planned submittal	Comments provided on R0	Rev 0 - 12/19/2006	ML070030472		
06-0025	1b	Define minimum acceptable pre-plan scope.	3.4 Industrial Fire Brigade - 3.4.2.1 - The plans shall detail the fire area configuration and fire hazards to be encountered in the fire area, along with any nuclear safety components and fire protection systems and features that are present. Suggest define more clearly what the minimum acceptable pre-plan scope is. Consider use of existing guidance.	Presented to Task Force 11/30/06 R1b updated 4/19 Closed June 21, 2007	Closed	HNP	Holder	Barbadoro	R1 submitted to NRC	Comments provided on R0	Rev 0 - 12/19/2006 Rev 1b - 05/08/2007	ML070030476 ML071340194	CLOSED 6/21/07 ML071940375	
06-0026	0	Clarify NFPA code requirements for gear maintenance	3.4.4 Fire-Fighting Equipment - Protective clothing, respiratory protective equipment, radiation monitoring equipment, personal dosimeters, and fire suppression equipment such as hoses, nozzles, fire extinguishers, and other needed equipment shall be provided for the industrial fire brigade. This equipment shall conform with the applicable NFPA standards. Clarify that intent is for design and purchase of equipment. NFPA code requirements for gear maintenance is not applicable.	Presented to Task Force 11/30/06 Comments from Task Force to initiator by 12/14/06 Submitted to NRC 12/19/06 Preliminary verbal comments provided by NRC. WITHDRAWN 5/17/07	M	HNP	Holder	Oudinot	WITHDRAWN 5/17/07	Proposed withdraw	Rev 0 - 12/19/2006	ML070030480	Withdrawn 5/17/07 ML071510425	

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06-0027	0	Clarify the "where provided" statement.	3.7 Fire Extinguishers - Where provided, fire extinguishers of the appropriate number, size, and type shall be provided in accordance with NFPA 10, Standard for Portable Fire Extinguishers. Extinguishers shall be permitted to be positioned outside of fire areas due to radiological conditions. Part of NFPA 10 is placement / travel distances for extinguishers. The 'where provided' statement needs clarification.	To TF by Feb 07 Not discussed on 1/18/07 Rev 0 sent to NRC on 5/17/07 Awaiting NRC Review and comments	M	ANO	Puckett	Barrett	Submitted R0 to NRC		Rev 0 - 05/17/2007	ML071380236		
06-0028	2	Clarify intent of "familiarization with plant fire prevention procedures, fire reporting, and plant emergency alarms" regarding scope of or depth of the training.	3.3.1.1 General Fire Prevention Activities - (1) Training on fire safety information for all employees and contractors including, as a minimum, familiarization with plant fire prevention procedures, fire reporting, and plant emergency alarms Clarify the intent of 'familiarization'.	Presented to Task Force 11/30/06 Comments from Task Force to initiator by 12/14/06 Submitted to NRC 12/19/06 Not discussed on 1/18/07 Submitted to NRC 5/21/07	Closed	HNP	Holder	Oudinot	R2 submitted to NRC	Comments provided on R1	Rev 0 - 12/19/2006 Rev 1 - 05/08/2007 Rev 2 - 05/21/2007	ML070030489 ML071340195 ML071550415	CLOSED 6/21/07 ML071940375	
06-0029		Clarify zone of influence for NUREG 6850 Task 8.	FDT spreadsheets are used to provide a zone of influence.	Submitted to the task force: 12/19/06 Discuss at January 24, 2007 FPRA meeting Not discussed on 1/18/07 WITHDRAWN 6/21/07	L	HNP	Thompson						Withdrawn 6/21/07 ML071940375	
07-0030		Risk of recovery actions	4.2.4 Clarification of risk impact of recovery actions, to include extension of existing HRA scenarios	FAQ by 3Q 2007	M	HNP	Masterlark							
07-0031	0	Misc Binning Issues	Miscellaneous ignition frequency binning issues. Questions arise during ignition frequency counting, such as: MOV motors, Hydraulic actuators for valves, Transformers	Draft to NEI TF for April 2007. Awaiting NRC review and comments - been sent to Research Submitted to NRC on 7/19/07	M	HNP	Miskiewicz	Gallucci	Submitted R0 to NRC	7/19/2007	Rev 0 - 05/17/2007	ML071380238		
07-0032	0	10CFR 50.48(a) and GDC 3 clarification	Clarify that satisfying 10 CFR 50.48(c) will satisfy 10 CFR50.48(a) and GDC3	Submitted to NRC 7/12/07	M	HNP	Holder	Barrett	Submitted R0 to NRC		Rev 0 - 05/17/2007	ML071930378		
07-0033	0	Review of Existing Engineering Equivalency Evaluations	Discuss how EEEE will be reviewed and summarized for transition	Submitted to NRC 7/12/07	M	HNP	Holder	Frumkin	Submitted R0 to NRC		Rev 0 - 07/12/2007	ML071930379		
07-0034		Determination of non-vented Cabinets	Clarification of guidance for determining if an electrical cabinet can be dispositioned as non-vented	Draft to NEI TF for May 2007 FAQ submitted by June Afzali to PRA Task Force by 8/3. Due to NFPA 805 TF by 8/13. To NRC by 8/23.	M	HNP	Miskiewicz	TF reviewing						
07-0035	0	Bus Duct counting guidance for High Energy Arcing Faults	Split from FAQ 06-0017 - Bus duct	July 13 meeting between industry (PRA Task Force) and NRC Task Force Internal to Task Force - definitions of Sealed cabinet versus non-vented cabinet Task 11 versus Task 6 NRC to discuss in panel meeting on 8/17/07	M	HNP	Miskiewicz	Dinh	Submitted R0 to NRC		Rev 0 - 06/01/2007	ML071650151		
07-0036		Define compliance categories for Table B-1	NEI 04-02 update to include lessons learned on Table B-1 process	FAQ sent to task force for review (7/16/07) Present to NRC 7/19/07	H	HNP	Holder		Submitted R0 to NRC					
07-0037		Environmental considerations for equipment	Provide guidance regarding environmental considerations of other equipment in the fire affected area	Draft FAQ for August 2007 TF Meeting Task Force withdraws FAQ since issue is already addressed in NUREG/CR 6850 Section H.2 (page H-10)	M	HNP	Holder							
07-0038		Lessons learned for OMA, MSO and FPRA	Incorporate pilot lessons learned for preemptive manual actions, MSO expert panel and Fire PRA processes into NEI 04-02	Draft FAQ for August 2007 TF Meeting	H	HNP	Began							

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07-0039		Provide update of NEI 04-02 B-2 and B-3 Processes	NEI 04-02 update to include lessons learned on Table B-2 and B-3 processes	Draft FAQ for August 2007 TF Meeting	H	HNP	Ratchford							