FAQ Number 06-0008 **FAQ Revision** 8

FAQ Title Alternative Method for Fire Protection Engineering Analyses

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☒ 805 TF ☒ 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 codes, standards, and listings referenced 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 2.3, 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:

Proposed resolution of FAQ and the basis for the proposal:

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.

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 deviations from the codes, standards, and listings referenced 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, 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 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 Process Not Applicable: These NFPA 805 Chapter 3 sections do not have referenced codes, standards, or listings. Therefore, the 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	Referenced Code / Standard / Listing
3.1	General		X	
3.2	Fire Protection Plan		X	

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable	Referenced Code / Standard / Listing
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		**3.3.1.2** (2) NFPA 701 (5) NFPA 30 (6) "applicable NFPA codes and standards" **3.3.1.2.1** NFPA 51B NFPA 241
3.3.2	Structural	X		**3.3.2** NFPA 220
3.3.3	Interior Finishes	X		**3.3.3** NFPA 101
3.3.4	Insulation Materials		X	
3.3.5	Electrical	X		**3.3.5.1** …electrical wiring shall be listed for plenum use.." (Note 1)
3.3.6	Roofs	X		NFPA 256
3.3.7	Bulk Flammable Gas Storage	X		**3.3.7.1** NFPA 50A
3.3.8	Bulk Storage of Flammable and Combustible Liquids	X		NFPA 30
3.3.9	Transformers		X	
3.3.10	Hot Pipes and Surfaces		X	

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable	Referenced Code / Standard / Listing
3.3.11	Electrical Equipment		X	
3.3.12	Reactor Coolant Pumps		X	
3.4	Industrial Fire Brigade	See sub-sections		
3.4.1	On-Site Fire Fighting Capability	X		**(a)(1), (2), and (3)** NFPA 600 NFPA 1500 NFPA 1582
3.4.2	Pre-Fire Plans		X	
3.4.3	Training and Drills	X		**(a)(1)** NFPA 600 NFPA 1500
3.4.4	Fire Fighting Equipment	X		"….with the applicable NFPA standards."
3.4.5	Off-Site Fire Department Interface		X	
3.4.6	Communications		X	
3.5	Water Supply	X		**3.5.1(b)** NFPA 13 NFPA 15 **3.5.2** NFPA 22 **3.5.3** NFPA 20 **3.5.10** NFPA 24 **3.5.13** ANSI B31.1 **3.5.15** NFPA 24

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable	Referenced Code / Standard / Listing
3.6	Standpipe and Hose Stations	X		**3.6.1** NFPA 14 **3.6.3** "Listed electrically safe fixed fog nozzles…"
3.7	Fire Extinguishers	X		NFPA 10
3.8	Fire Alarm and Detection Systems			See sub-sections
3.8.1	Fire Alarm	X		NFPA 72
3.8.2	Detection	X		NFPA 72
3.9	Automatic and Manual Water-Based Fire Suppression Systems	X		**3.9.1** NFPA 13 NFPA 15 NFPA 750 NFPA 16
3.10.	Gaseous Fire Suppression Systems	X		**3.10.1** NFPA 12 NFPA 12A NFPA 2001
3.11	Passive Fire Protection Features	See sub-sections		
3.11.1	Building Separation (Note 2)	X		NFPA 80A
3.11.2	Fire Barriers	X		NFPA 251 ASTM E 119
3.11.3	Fire Barrier Penetrations	X		"…listed fire-rated door assemblies or listed fire rated fire dampers…" (1) NFPA 80 (2) NFPA 90A (3) NFPA 101

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable	Referenced Code / Standard / Listing
3.11.4	Through Penetration Fire Stops	X		"….with a fire test protocol acceptable to the AHJ or be protected by a listed fire-rated device…."
3.11.5	Electrical Raceway Fire Barrier Systems (ERFBS)		X	(Note 3)

Note 1 – Flame propagation tests/standards for electrical cable construction are addressed by FAQ 06-0022.
Note 2 – Section 3.11.1 of NFPA 805 also contains an exception for performance-based analysis.
Note 3 – Generic Letter 86-10, Supplement 1 is not considered a referenced code, standard, or listing referenced in NFPA 805 for the purposes of this method. However, Section 3.11.5 of NFPA 805 is conditional based on NFPA 805 Chapter 4 and performance-based methods are allowed for this section, see Clarification section below.

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 based on the change process in NFPA 805 (NEI 04-02 Section 5.3). 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 features 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 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 C.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.

10 CFR 50.48(c)(2)(vii) Requirement	Method of Accomplishment
(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.

CLARIFICATION

Certain fire protection systems and features have performance requirements that are conditional upon NFPA 805 Chapter 4 requirements. These systems and features are:

- Fire Alarm and Detection Systems [NFPA 805 Section 3.8]
- Automatic and Manual Water-Based Fire Suppression Systems [NFPA 805 Section 3.9]
- Gaseous Fire Suppression Systems [NFPA 805 Section 3.10]
- Passive Fire Protection Features [NFPA 805 Section 3.11]

For these systems and features, the performance requirements are established by the deterministic and/or performance-based analyses used in demonstrating how the NFPA 805 Chapter 4 performance criteria are met. Fire Protection Engineering Analyses may be used to demonstrate how these systems and features meet the NFPA 805 Chapter 4 criteria (e.g., coverage/performance of a detection / suppression system, ability of fire barriers to withstand expected fire hazards, etc.). These Fire Protection Engineering Analyses, however, are allowed under 10 CFR 50.48(c) and do not require specific permission under 10 CFR 50.48(c)(2)(vii), "Performance-Based Methods".

CONCLUSION

This 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 method 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]

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, standards, and listings referenced 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 NFPA codes, standards, and listings referenced 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 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 codes, standards, and listings referenced 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 codes, standards, and listings referenced 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 codes, standards, and listings referenced 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.)

~~NFPA 805 Section 1.7 Equivalency states that "Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance,~~

~~effectiveness, durability and safety over those prescribed by this standard. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency." Licensees can deviate from the NFPA standards referenced in NFPA 805 Chapter 3 without NRC approval if allowed by the code of record, so long as the evaluated condition is in accordance with the terms of the code of record or if the code does not dictate the specific issue (e.g., adequacy of coverage of suppression and detection systems). In addition to the performance-based methods outlined in NFPA 805, the NRC will provide guidance on Analytical methods and tools and methods acceptable for use in NFPA 805 applications in the Regulatory Guide for the adoption of 10 CFR 50.48. Therefore approval will be required for:~~

- ~~Changes that have been evaluated using performance-based methods other than the 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 codes, standards, and listings referenced 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.~~out NRC approval if allowed by the code of record, so long as the evaluated condition is in accordance with the terms of the code of record (e.g., "Nothing in this standard is intended to restrict new technologies or alternate arrangements, providing the level of safety prescribed by the standard is not lowered." Excerpt from 1985 edition of NFPA 13) or if the code does not dictate the specific issue (e.g., adequacy of coverage of suppression and detection systems).~~

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.
- ~~Changing the surveillance frequency of a fire protection feature or system based on NFPA standard as long as the underlying basis for the NFPA standard frequency is the same. This does not require a license amendment because the surveillance frequency would satisfy that specified in the current edition of NFPA codes for providing reasonable assurance that the system or component is maintained in an operable condition~~.
- 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:

- ~~Revision of concentration of an agent to a value less than that required by the respective code or previously approved value.~~
- 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

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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.

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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.~~Changes that deviate from the NFPA standards referenced in NFPA 805 Chapter 3 can be made without NRC approval if allowed by the code of record (so long as the evaluated condition is in accordance with the terms of the code of record) or if the code does not dictate the specific issue (e.g., adequacy of coverage of suppression and detection systems). Ensure documentation for determination of acceptability is included and meets NEI 04-02 requirements for documentation.~~ (See Attachment 2)
   - o ☐ Yes Document conclusions, complete remaining sections.
   - o ☐ No License Amendment Request must be processed for NRC approval. Complete remaining sections.

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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 codes, standards, and listings referenced 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."

~~In general, deviations from Chapter 3 must be submitted for NRC approval per the Rule. However, licensees can deviate from the NFPA standards referenced in Chapter 3 without NRC approval if allowed by the code of record and the changed condition is in accordance with the terms of the code of record (e.g., many earlier editions of NFPA Codes included the following statement: "Nothing in this standard is intended to restrict new technologies or alternate arrangements, providing the level of safety prescribed by the standard is not lowered." - From 1985 edition of NFPA 13) or if the code (including NFPA 805, Chapter 3) does not dictate the specific issue (e.g., suppression system or detection system coverage).~~ 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.
- ~~Changing the surveillance frequency for a fire protection feature, as long as the new frequency is bounded by the NFPA code of record (and does not increase CDF or LERF), providing reasonable assurance that the system or component is maintained in an operable condition.~~
- 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

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 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 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", to allow 10 CFR 50.48(c) licensees to establish a process that enables them to make changes to Chapter 3 of NFPA 805, as long as those changes only affect the referenced codes, standards and listings, such as Underwriters Laboratory, Inc. or Factory Mutual listings. 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 under this license amendment will undergo the same evaluation process 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 referenced codes, standards, 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

Licensees will propose an 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 deviations from the codes, standards, and listings referenced 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 and the NFPA 805 change process is used."

The following table 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 Process Not Applicable: These NFPA 805 Chapter 3 sections do not have referenced codes, standards, and listings. Therefore, the 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	Referenced Code / Standard / Listing
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		**3.3.1.2** (2) NFPA 701 (5) NFPA 30 (6) "applicable NFPA codes and standards" **3.3.1.2.1** NFPA 51B NFPA 241
3.3.2	Structural	X		**3.3.2** NFPA 220
3.3.3	Interior Finishes	X		**3.3.3** NFPA 101
3.3.4	Insulation Materials		X	
3.3.5	Electrical	X		**3.3.5.1** …electrical wiring shall be listed for plenum use.." (Note 1)
3.3.6	Roofs	X		NFPA 256
3.3.7	Bulk Flammable Gas Storage	X		**3.3.7.1** NFPA 50A

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable	Referenced Code / Standard / Listing
3.3.8	Bulk Storage of Flammable and Combustible Liquids	X		NFPA 30
3.3.9	Transformers		X	
3.3.10	Hot Pipes and Surfaces		X	
3.3.11	Electrical Equipment		X	
3.3.12	Reactor Coolant Pumps		X	
3.4	Industrial Fire Brigade	See sub-sections		
3.4.1	On-Site Fire Fighting Capability	X		(a)(1), (2), and (3) NFPA 600 NFPA 1500 NFPA 1582
3.4.2	Pre-Fire Plans		X	
3.4.3	Training and Drills	X		(a)(1) NFPA 600 NFPA 1500
3.4.4	Fire Fighting Equipment	X		"….with the applicable NFPA standards."
3.4.5	Off-Site Fire Department Interface		X	
3.4.6	Communications		X	
3.5	Water Supply	X		**3.5.1(b)** NFPA 13 NFPA 15 **3.5.2** NFPA 22 **3.5.3** NFPA 20 **3.5.10** NFPA 24 **3.5.13** ANSI B31.1 **3.5.15** NFPA 24
3.6	Standpipe and Hose Stations	X		**3.6.1** NFPA 14 **3.6.3** "Listed electrically safe fixed fog nozzles…"
3.7	Fire Extinguishers	X		NFPA 10

Section	Title	FP Eng. Analysis Process Applicable	FP Eng. Analysis Process Not Applicable	Referenced Code / Standard / Listing
3.8	Fire Alarm and Detection Systems			See sub-sections
3.8.1	Fire Alarm	X		NFPA 72
3.8.2	Detection	X		NFPA 72
3.9	Automatic and Manual Water-Based Fire Suppression Systems	X		**3.9.1** NFPA 13 NFPA 15 NFPA 750 NFPA 16
3.10.	Gaseous Fire Suppression Systems	X		**3.10.1** NFPA 12 NFPA 12A NFPA 2001
3.11	Passive Fire Protection Features	See sub-sections		
3.11.1	Building Separation (Note 2)	X		NFPA 80A
3.11.2	Fire Barriers	X		NFPA 251 ASTM E 119
3.11.3	Fire Barrier Penetrations	X		"…listed fire-rated door assemblies or listed fire rated fire dampers…" (1) NFPA 80 (2) NFPA 90A (3) NFPA 101
3.11.4	Through Penetration Fire Stops	X		"….with a fire test protocol acceptable to the AHJ or be protected by a listed fire-rated device…."
3.11.5	Electrical Raceway Fire Barrier Systems (ERFBS)		X	(Note 3)

Note 1 - Flame propagation tests/standards for electrical cable construction are addressed by FAQ 06-0022.
Note 2 - Section 3.11.1 of NFPA 805 also contains an exception for performance-based analysis.
Note 3 – Generic Letter 86-10, Supplement 1 is not considered a referenced code, standard, or listing referenced in NFPA 805 for the purposes of this method. However, Section 3.11.5 of NFPA 805 is conditional based on NFPA 805 Chapter 4 and performance-based methods are allowed for this section, see section L.5 below.

L.3 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. 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 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, performance criteria, defense-in-depth and safety margins are satisfied. By only allowing changes to the 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). Features described in referenced codes, standards and listings may be changed based on an evaluation, using the required methods in the NFPA 805 change process (Section 5.3 of NEI 04-02), which is similar to what 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 and supplemented by RG 1.205 Section C.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.

L.5 Clarification

Certain fire protection systems and features have performance requirements that are conditional upon NFPA 805 Chapter 4 requirements. These systems and features are:

- Fire Alarm and Detection Systems [NFPA 805 Section 3.8]
- Automatic and Manual Water-Based Fire Suppression Systems [NFPA 805 Section 3.9]
- Gaseous Fire Suppression Systems [NFPA 805 Section 3.10]
- Passive Fire Protection Features [NFPA 805 Section 3.11]

For these systems and features, the performance requirements are established by the deterministic and/or performance-based analyses used in demonstrating how the NFPA 805 Chapter 4 performance criteria are met. Fire Protection Engineering Analyses may be used to demonstrate how these systems and features meet the NFPA 805 Chapter 4 criteria (e.g., coverage/performance of a detection / suppression system, ability of fire barriers to withstand expected fire hazards, etc.). These Fire Protection Engineering Analyses, however, are allowed under 10 CFR 50.48(c) and do not require prior NRC approval per10 CFR 50.48(c)(2)(vii), "Performance-Based Methods".

L.6 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, standards, 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, standards, or listings, would have to be submitted for NRC approval on a case by case basis.