

Plant: Harris

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805TF FPWG RATF RIRWG BWROG PWROG

Purpose of FAQ:

The purpose of FAQ 06-0008 is to provide clarification on the use of fire protection engineering analyses post-transition. Currently, licensees may self approve these evaluations under the existing fire protection license condition.

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):

Section 5.3.2, page 46

Circumstances requiring guidance interpretation or new guidance:

The Current Licensing Basis (CLB) allows the flexibility to use performance-based technical analysis in accordance with Generic Letter 86-10 to demonstrate compliance with deterministic fire protection rules.

Existing guidance documents do not fully explain how and when Fire Protection Engineering Evaluations (FPEEs) can be used once the Fire Protection Program (FPP) has transitioned to a risk-informed, performance-based FPP in accordance with 10 CFR 50.48(c) and NFPA 805.

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

NFPA 805 section 3.1 states that the fire protection program elements and minimum design requirements of Chapter 3, "shall not be subject to the performance-based methods permitted elsewhere in this standard."

The fundamental fire protection program elements and 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 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 07-0033 provides guidance for evaluating existing FPEEs to determine which ones must be submitted for NRC approval in a license amendment request during transition.

Response Section:

Proposed resolution of FAQ and the basis for the proposal:

BACKGROUND

Prior to the completion of transition, those licensees that have adopted the standard fire protection license condition 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. The method used to perform these changes was originally described in Generic Letter 86-10. The method has been referred to using several different names: Generic Letter 86-10 Evaluation, Fire Protection Engineering Evaluation, Fire Protection Engineering Equivalency Evaluation, etc. For the purposes of this FAQ, these evaluations will be called Fire Protection Engineering Evaluations.

Licensees transitioning to a risk-informed, performance-based FPP in accordance with 10 CFR 50.48(c) and NFPA 805 have found that there is a continuing need to be able to use FPEEs to address minor deviations from the fire protection requirements.

METHOD

For use in evaluating changes to the FPP post-transition, Fire Protection Engineering Evaluations (FPEEs) will be broken down into three categories. The first is essentially an engineering equivalency evaluation that demonstrates that a given situation (component, system, procedure, physical arrangement, etc.) is functionally equivalent to the corresponding code/listing requirement and is therefore considered to be "compliant". The second demonstrates that a given situation (component, system, procedure, physical arrangement, etc.) is "adequate for the hazard." The third is called the "bounding analysis approach."

Functional Equivalency

Under NFPA 805 rules, FPEEs of the first type may continue to be used to demonstrate compliance to the fundamental program and design elements of NFPA 805 Chapter 3 and the requirements of NFPA 805 Chapter 4 (utilizing the deterministic approach of Section 4.2.3 or the performance-based approach of Section 4.2.4) since they demonstrate that a given situation meets the requirements of the governing fire protection code/listing.

Adequate for the Hazard

FPEEs of the second type may also be used, with specific limitations, to demonstrate compliance to the requirements of NFPA 805.

Certain fire protection systems and features have requirements that are conditional upon the results of analyses performed in accordance with NFPA 805 Chapters 1, 2 and 4 to demonstrate the ability to meet the nuclear safety performance criteria. 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]

In addition although the following Sections of NFPA 805 do not specifically refer to Chapter 4, they are also conditional upon the results of analyses performed in accordance with NFPA 805 Chapters 1, 2 and 4 to demonstrate the ability to meet the nuclear safety performance criteria. These systems and features are:

- Structural [NFPA 805 Section 3.3.2]
- Interior Finishes [NFPA 805 Section 3.3.3]
- Roofs [NFPA 805 Section 3.3.6]
- Separation of fire pumps by rated fire barriers [NFPA 805 Section 3.5.5]
- Hydrants and hose house spacing. [NFPA 805 Section 3.5.15]
- Standpipe and Hose Stations placement [NFPA 805 Section 3.6]
- Fire Extinguishers placement [NFPA 805 Section 3.7]

When using the performance-based approach in accordance with NFPA 805 Section 4.2.4, the performance requirements that these systems and features must meet are established by the analyses performed in accordance with NFPA 805 Chapters 1, 2 and 4 to demonstrate the ability to meet the nuclear safety performance criteria. FPEEs may be used to establish the performance requirements that these systems and features must meet (e.g., coverage of a detection / suppression system, ability of fire barriers to withstand expected fire hazards for a specific duration, etc.).

NFPA 805 Section 2.4 states:

“Engineering analysis is an acceptable means of evaluating a fire protection program against performance criteria. Engineering analyses shall be permitted to be qualitative or quantitative in accordance with Figure 2.4. The effectiveness of the fire protection features shall be evaluated in relation to their ability to detect, control, suppress, and extinguish a fire and provide passive protection to achieve the performance criteria and not exceed the damage thresholds defined in Section 2.5 for the plant area being analyzed.”

The NFPA 805 committee has provided guidance on the intended use of FPEEs once NFPA 805 is adopted for a facility. Section A.2.2.7 states:

“Once NFPA 805 is adopted for a facility, future equivalency evaluations (previously known as Generic Letter 86-10 evaluations) are to be conducted using a performance-based approach. The evaluation should demonstrate that the specific plant configuration meets the performance criteria in the standard.”

Some engineering evaluations use a qualified engineer’s informed judgment (informed with

respect to a technical requirement or a standard) as the basis for meeting the regulatory requirement. To the extent a qualified fire protection engineer has concluded a minor change has not affected the adequacy for the hazard using a relevant technical requirement, the licensee continues to meet 10 CFR 50.48(c) and as such, does not require prior NRC approval..

Bounding Analysis Approach

In the “bounding analysis approach,” FPEEs may be used to justify performance requirements for a specific NFPA 805 Chapter 3 attribute, through the use of a bounding engineering analysis that clearly demonstrates that the fire protection attribute continues to provide the required protection when evaluated against the required technical and/or performance criteria and the bounding assumptions are acceptable with respect to risk, fire protection defense-in-depth and safety margins. The use of the bounding analysis approach requires the licensee to obtain prior NRC approval through the submittal of a license amendment request in accordance with 10 CFR 50.48(c)(2)(vii) and the addition of a section to the Fire Protection license condition addressing the change. Upon NRC approval, the licensee can make changes to the plant using FPEEs within the approved envelope for the bounding analysis performed to support the license amendment request.

Fire Protection License Condition Change

An additional paragraph must be added to the Fire Protection license condition proposed in RG 1.205 to address the implementation of the “bounding analysis approach.” The additional license condition discussion addresses the process for establishing the bounding analysis, the need to submit a description of the bounding analysis process and results and the requirement that the bounding analysis approach be approved for use through a license amendment request. Upon approval of the license amendment request for the specific bounding analysis application, the licensee may self-approve implementation of plant changes within the constraints of the bounding analysis through the use of FPEEs. To implement this approach, the licensee would add the following paragraph to the Fire Protection license condition:

“In addition to the risk-informed changes described above, the licensee may also make changes to the Approved Fire Protection Program using the bounding analysis method described in license amendment request dated _____ and as approved in the safety evaluation report dated _____ (and supplement dated _____).”

Example Applications of the Bounding Approach

Example A licensee desires the ability to self approve changes to the combustible control program during outages. A specific process that needs to be performed (maintenance on safety related equipment) requires the use of a flammable solvent. The solvent only comes in 12 gallon cans, which is larger than those allowed by the code of record (NFPA 30, 1985). Based on an analysis of the process involved, the engineering team at the licensee postulates that the safest way to address the process and the handling of the solvent is to allow the larger cans in the plant. The licensee takes the worst case configuration required and uses that as the basis for the necessary calculations (Fire PRA, radioactive release, fire modeling, etc.). The results of those analyses are used in a license amendment request to obtain NRC approval under 10 CFR 50.48(c)(2)(vii) for the bounding configuration using the larger can. The analyses demonstrate that the configuration is acceptable from a risk standpoint and that fire protection defense-in-depth and

Comment [eak1]: This should be allowed as a functional equivalent

safety margins are maintained. Upon NRC approval, the licensee may make changes to the fire protection program (e.g. combustible control procedure), evaluate those changes using a FPEE, and then self-approve the change as necessary throughout the plant, within the bounds of the analyses performed.

CONCLUSION

Fire Protection Engineering Evaluations (FPEEs) may be used to demonstrate compliance to NFPA 805 requirements using the three different types of FPEEs (functional equivalency, adequate for the hazard, and bounding approach) within the bounds defined in this document. Two of these approaches are allowable under the existing framework of NFPA 805 and do not require a submittal or prior NRC staff approval (functional equivalency evaluations and adequate for the hazard). The other approach does require prior NRC staff approval (bounding analysis approach) however; it is not intended to preclude licensees from temporality addressing issues with other aspects of their fire protection program, such as interim compensatory measures and those controls implemented to address fires in non-power operational modes. Using the bounding analysis approach, the licensee performs bounding performance-based analyses, demonstrates that the bounding configuration is acceptable, and upon NRC staff approval, may use FPEEs to justify changes to the plant within the bounds of the approved analyses.

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

Revision:

[See attached proposed revision to NEI 04-02]