

NRC Staff Comments on FAQ 12-0062, Revision 0 [CEM, PWL, HTB] {April 2012}

FAQ Number 12-0062 **FAQ Revision** 0
FAQ Title UFSAR Content

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Distribution: (NEI Internal Use)

805 TF FPWG RATF RIRWG BWROG PWROG

Purpose of FAQ:

The purpose of this FAQ is to provide a standard level of detail for the fire protection program sections of the Updated Final Safety Analysis Report (UFSAR).

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):

Clarification is required to develop consistent post-transition UFSAR for the Fire Protection Program under NFPA 805. The clarification is based on guidance and feedback developed for the pilot plants. This will supplement the guidance currently in NEI 04-02, Section 4.6 Regulatory Submittal and Transition Documentation.

Circumstances requiring guidance interpretation or new guidance:

Lessons learned during the pilot plant process.

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

None

Potentially relevant existing FAQ numbers:

None

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Response Section:

Proposed resolution of FAQ and the basis for the proposal:

See specific revisions listed below.

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

Remove the following bullet from Section 4.6.1 License Amendment Request.

A discussion of the changes to Updated Final Safety Analysis Report (UFSAR) necessitated by the license amendment and a statement that the changes will be made in accordance with 10 CFR 50.71(e).

Add the following new Section 4.6.3 UFSAR Revision

4.6.3 UFSAR Revision

As part of the transition to a fire protection program in compliance with 10 CFR 50.48(c), the licensee will update the Updated Final Safety Analysis Report (UFSAR) section on the fire protection program, to provide a general description of the NFPA 805 fire protection program and fire protection systems and features.

Guidance on the level of detail appropriate for updating FSARs is contained in NEI 98-03, “Guidelines for Updating Final Safety Analysis Reports”, which the NRC endorsed in RG 1.181, “Content of the Updated Final Safety Analysis Report in Accordance with 10 CFR 50.71(e)”. According to this guidance, licensees may simplify their UFSARs by removing information that is duplicated in separate, controlling program documents (e.g., the Fire Protection Plan, etc.), as long as the controlling program documents are referenced. Accordingly, the licensee’s proposed UFSAR revision that provides a general description of the NFPA 805 Fire Protection Program should be in alignment with this guidance, since it references the appropriate documents.

The proposed UFSAR revision would indicate appropriate “general references” documents, but would not “incorporate by reference” those documents that provide a more detailed description and basis for the risk-informed, performance-based fire protection program (based on the definitions of “General References” and “Incorporation by Reference” in NEI 98-03, Revision 1). After the approval of the LAR, in accordance with 10 CFR 50.71(e), the fire protection section(s) of the UFSAR should be revised. The fire protection section should include the following (numbering may differ):

9.5.1 Fire Protection

Provide general discussion of the Fire Protection Program regulatory requirements.

9.5.1.1 Design Basis Summary

Provide a discussion of defense-in-depth

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Provide general discussion of the nuclear and radioactive performance criteria

Provide a general discussion of Chapter 2, 3, and 4 NFPA 805.

Provide a discussion of codes of record

9.5.1.2 Systems Description

Required Nuclear Safety Capability Systems, Equipment and cables

Required Fire Protection System and Features

Required SSCs for radioactive release

Power Block Definition and Structures

9.5.1.3 Safety Evaluation (Fire Safety Analysis)

Point to and describe fire protection program design basis document(s)

9.5.1.4 Fire Protection Program

Point to and describe fire protection program plan document(s) that describe organization, responsibilities, processes/procedures, and qualifications.

Comment [C1]: There appears to be a word or words missing here.

Also add the following section to the LAR template:

5.4 Revision to the UFSAR

After the approval of the LAR, in accordance with 10 CFR 50.71(e), the [ENTER PLANT] UFSAR will be revised. The format and content will be consistent with FAQ 12-0062.

Comment [C2]: The LAR template should not point to the FAQ, as the FAQ will go away after final approval.

EXAMPLE UFSAR TEXT (NOT TO BE INCLUDED IN NEI 04-02)

9.5.1 Fire Protection

The fire protection program is based on the NRC requirements and guidelines, Nuclear Electric Insurance Limited (NEIL) Property Loss Prevention Standards and related industry standards. With regard to NRC criteria, the fire protection program meets the requirements of 10 CFR 50.48(c), which endorses, with exceptions, the National Fire Protection Association’s (NFPA) 805, “Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants – 2001 Edition. [ENTER PLANT] has further used the guidance of NEI 04-02, “Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48(c)” as endorsed by Regulatory Guide 1.205, “Risk-Informed, Performance Fire Protection for Existing Light-Water Nuclear Power Plants.”

Adoption of NFPA 805, “Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants”, 2001 Edition in accordance with 10 CFR 50.48(c) serves as the method of satisfying 10 CFR 50.48(a) and General Design Criterion 3. Prior to adoption of NFPA 805, General Design Criterion 3, "Fire Protection" of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Licensing of Production and Utilization Facilities," was followed in the design of safety and non-safety related structures, systems, and components, as required by 10 CFR 50.48(a).

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. However, under NFPA 805, the means by which GDC 3 or 10 CFR 50.48(a) requirements are met may be 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 satisfied by meeting the performance criteria in Section 1.5.1 of NFPA 805.

A Safety Evaluation was issued on [ENTER DATE] by the NRC, that transitioned the existing fire protection program to a risk-informed, performance-based program based on NFPA 805, in accordance with 10 CFR 50.48(c).

9.5.1.1 Design Basis Summary

9.5.1.1.1 Defense-in-Depth

The fire protection program is focused on protecting the safety of the public, the environment, and plant personnel from a plant fire and its potential effect on safe reactor operations. The fire protection program is based on the concept of defense-in-depth. Defense-in-depth shall be achieved when an adequate balance of each of the following elements is provided:

- (1) Preventing fires from starting,
- (2) Rapidly detecting fires and controlling and extinguishing promptly those fires that do occur, thereby limiting fire damage,

Comment [C3]: The NRC staff is unclear on the purpose of the material marked "(NOT TO BE INCLUDED IN NEI 04-02)". The purpose of the FAQ process is to develop changes to the Reg Guide and NEI 04-02 that are acceptable to both the NRC and industry stakeholders. If an example is desired, one should be developed for inclusion in NEI 04-02, since the FAQ will not exist as a separate document after final approval. The NRC staff also notes that when the NRC endorses an industry guidance document in a regulatory guide, examples in the industry document are usually specifically not endorsed.

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EXAMPLE UFSAR TEXT (NOT TO BE INCLUDED IN NEI 04-02)

- (3) Providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed.

9.5.1.1.2 NFPA 805 Performance Criteria

The design basis for the fire protection program is based on the following nuclear safety and radiological release performance criteria contained in Section 1.5 of NFPA 805:

Nuclear Safety Performance Criteria. Fire protection features shall be capable of providing reasonable assurance that, in the event of a fire, the plant is not placed in an unrecoverable condition. To demonstrate this, the following performance criteria shall be met.

- (a) Reactivity Control. Reactivity control shall be capable of inserting negative reactivity to achieve and maintain subcritical conditions. Negative reactivity inserting shall occur rapidly enough such that fuel design limits are not exceeded.
- (b) Select Appropriate performance criteria:
 - Inventory and Pressure Control. With fuel in the reactor vessel, head on and tensioned, inventory and pressure control shall be capable of controlling coolant level such that subcooling is maintained such that fuel clad damage as a result of a fire is prevented for a PWR.
 - Inventory and Pressure Control. With fuel in the reactor vessel, head on and tensioned, inventory and pressure control shall be capable of maintaining or rapidly restoring reactor water level above top of active fuel for a BWR such that fuel clad damage as a result of a fire is prevented.
- (c) Decay Heat Removal. Decay heat removal shall be capable of removing sufficient heat from the reactor core or spent fuel such that fuel is maintained in a safe and stable condition.
- (d) Vital Auxiliaries. Vital auxiliaries shall be capable of providing the necessary auxiliary support equipment and systems to assure that the systems required under (a), (b), (c), and (e) are capable of performing their required nuclear safety function.
- (e) Process Monitoring. Process monitoring shall be capable of providing the necessary indication to assure the criteria addressed in (a) through (d) have been achieved and are being maintained.

Radioactive Release Performance Criteria. Radiation release to any unrestricted area due to the direct effects of fire suppression activities (but not involving fuel damage) shall be as low as reasonably achievable and shall not exceed applicable 10 CFR, Part 20, Limits.

Chapter 2 of NFPA 805 establishes the process for demonstrating compliance with NFPA 805.

Chapter 3 of NFPA 805 contains the fundamental elements of the fire protection program and specifies the minimum design requirements for fire protection systems and features.

Chapter 4 of NFPA 805 establishes the methodology to determine the fire protection systems and features required to achieve the nuclear safety performance criteria outlined above. The methodology shall be permitted to be either deterministic or performance-based. Deterministic

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EXAMPLE UFSAR TEXT (NOT TO BE INCLUDED IN NEI 04-02)

requirements shall be “deemed to satisfy” the performance criteria, defense-in-depth, and safety margin and require no further engineering analysis. Once a determination has been made that a fire protection system or feature is required to achieve the nuclear safety performance criteria of Section 1.5, its design and qualification shall meet the applicable requirement of Chapter 3.

9.5.1.1.2 Codes of Record

The codes, standards and guidelines used for the design and installation of plant fire protection systems are as follows: (for specific applications and evaluations of codes refer to [Enter appropriate upper tier document(s)])

- a) American National Standards Institute (ANSI)
[List appropriate standards]
- b) American Society for Testing Materials (ASTM)
[List appropriate standards]
- c) Factory Mutual Research (FM) Fire Protection Equipment Approval Guide
[List appropriate guides]
- d) Institute of Electrical and Electronic Engineers (IEEE)
[List appropriate standards]
- e) National Fire Protection Association (NFPA)
[List appropriate codes and standards]

9.5.1.2 System Description

9.5.1.2.1 Required Systems

Nuclear Safety Capability Systems, Equipment, and Cables

Section 2.4.2 of NFPA 805 defines the methodology for performing the nuclear safety capability assessment. The systems equipment and cables required for the nuclear safety capability assessment are contained in **[ENTER appropriate upper tier reference]**.

Fire Protection Systems and Features

Chapter 3 of NFPA 805 contains the fundamental elements of the fire protection program and specifies the minimum design requirements for fire protection systems and features. Compliance with Chapter 3 is documented in **[ENTER appropriate upper tier reference]**.

Chapter 4 of NFPA 805 establishes the methodology and criteria to determine the fire protection systems and features required to achieve the nuclear safety performance criteria of Section 1.5 of NFPA 805. These fire protection systems and features shall meet the applicable requirements of NFPA 805 Chapter 3. These fire protection systems and features are documented in **[ENTER appropriate upper tier reference]**.

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EXAMPLE UFSAR TEXT (NOT TO BE INCLUDED IN NEI 04-02)

Radioactive Release

Structures, systems, and components relied upon to meet the radioactive release criteria are documented in [ENTER appropriate upper tier reference].

9.5.1.2.2 Definition of “Power Block” Structures

Where used in NFPA 805 Chapter 3 the terms “Power Block” and “Plant” refer to structures that have equipment required for nuclear plant operations. For the purposes of establishing the structures included in the fire protection program in accordance with 10 CFR 50.48(c) and NFPA 805, the plant structures listed in Table 9.5.1-1 are considered to be part of the ‘power block’.

9.5.1.3 Safety Evaluation

The [ENTER appropriate document name] documents the achievement of the nuclear safety and radioactive release performance criteria of NFPA 805 as required by 10 CFR 50.48(c). This document fulfills the requirements of Section 2.7.1.2 “Fire Protection Program Design Basis Document” of NFPA 805. The document contains the following:

- Identification of significant fire hazards in the fire area. This is based on NFPA 805 approach to analyze the plant from an ignition source and fuel package perspective.
- Summary of the Nuclear Safety Capability Assessment (at power and non-power) compliance strategies.
 - Deterministic compliance strategies
 - Performance-based compliance strategies (including defense-in-depth and safety margin)
- Summary of the Non-Power Operations Modes compliance strategies.
- Summary of the Radioactive Release compliance strategies.
- Summary of the Fire Probabilistic Risk Assessments.
- Key analysis assumptions to be included in the NFPA 805 monitoring program.

9.5.1.4 Fire Protection Program Documentation, Configuration Control and Quality Assurance

In accordance with Chapter 3 of NFPA 805 a fire protection plan documented in [ENTER appropriate document] defines the management policy and program direction and defines the responsibilities of those individuals responsible for the plan’s implementation. The [ENTER appropriate document]:

- Designates the senior management position with immediate authority and responsibility for the fire protection program.
- Designates a position responsible for the daily administration and coordination of the fire protection program and its implementation.
- Defines the fire protection interfaces with other organizations and assigns responsibilities for the coordination of activities. In addition, the [ENTER appropriate document] identifies the

