

FAQ Number 07-0036

FAQ Revision 0

FAQ Title Incorporation of Pilot Plant Lessons Learned - Table B-1

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805 TF FPWG FRATF RIRWG BWROG PWROG

Purpose of FAQ:

Provide definitions of compliance categories used during development of Table B-1.

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 4.3.1 and Appendix B

Circumstances requiring guidance interpretation or new guidance:

NEI 04-02, Rev 1 Section 4.3.1 states in part:

“A systematic approach should be taken when assessing the transitioning plant’s fire protection program against NFPA 805 Chapter 3 requirements. This is necessary to provide clear documentation of acceptance prior to moving forward with a new licensing basis. Specific acceptance of a plant configuration, as well as changes since original acceptance, should be documented. Each section and subsection of Chapter 3 should be reviewed against the current fire protection program. Licensees should provide specific compliance statements (deviations, exemptions, etc) to demonstrate "previous approval" of an alternative or compliance with the Chapter 3 attribute.”

Guidance needs to be provided to document the specific compliance categories assigned and methodologies used during the Chapter 3 review, and to update Figure 4-2 to reflect the process used by the pilot plants.

FAQ Number 07-0036

FAQ Revision 0

FAQ Title Incorporation of Pilot Plant Lessons Learned - Table B-1

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

N/A

Potentially relevant existing FAQ numbers:

None

Response Section:

Proposed resolution of FAQ and the basis for the proposal:

Basis:

Development of the Fundamental Fire Protection Program and Design Elements Transition using Table B-1 during the pilot plant transition indicated the need to clarify the compliance categories for NFPA 805 Chapter 3 sections. Certain programmatic elements and fire area specifics contained in the Current License Basis (CLB) were found to be best described by a series of specific Compliance Categories. This FAQ and change to NEI 04-02 reflects the definitions for each of the compliance categories, as well as revision to NEI 04-02, Figure 4-2 to reflect this methodology.

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

Revise Section 4.3.1 of NEI 04-02, Revision 1, and Appendix B-1 as shown below:

4.3.1 Fundamental Fire Protection Program and Design Elements Transition Review

NFPA 805 Chapter 3 contains the fundamental elements of the fire protection program and specifies the minimum design requirements for fire protection systems and features. These requirements are very similar to the guidelines of BTP 9.5-1 APCS (5/1/76), BTP 9.5-1 Appendix A (2/24/77), or NUREG-0800 BTP 9.5-1 CMEB (7/81). Each nuclear plant has an approved fire protection program that must demonstrate compliance with 10 CFR 50.48. For these reasons, a substantial part of an existing fire protection program can be transitioned to a new NFPA 805 licensing basis by performing a transition review.

NFPA 805, Chapter 3 states, “These fire protection program elements and minimum design requirements shall not be subject to the performance-based methods permitted elsewhere in this guidance. Previously approved alternatives from the fundamental program attributes of Chapter 3 of NFPA 805 [by the NRC] take precedence over the requirements contained herein.” The NRC has taken exception to this section of NFPA 805 and notwithstanding the prohibition in Section 3.1; a licensee may apply for license amendment(s) to use performance-based methods to demonstrate compliance.

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 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.

A ~~simplified~~ flowchart of the fundamental program and design elements transition review is provided as Figure 4-2.

FAQ Title Incorporation of Pilot Plant Lessons Learned - Table B-1

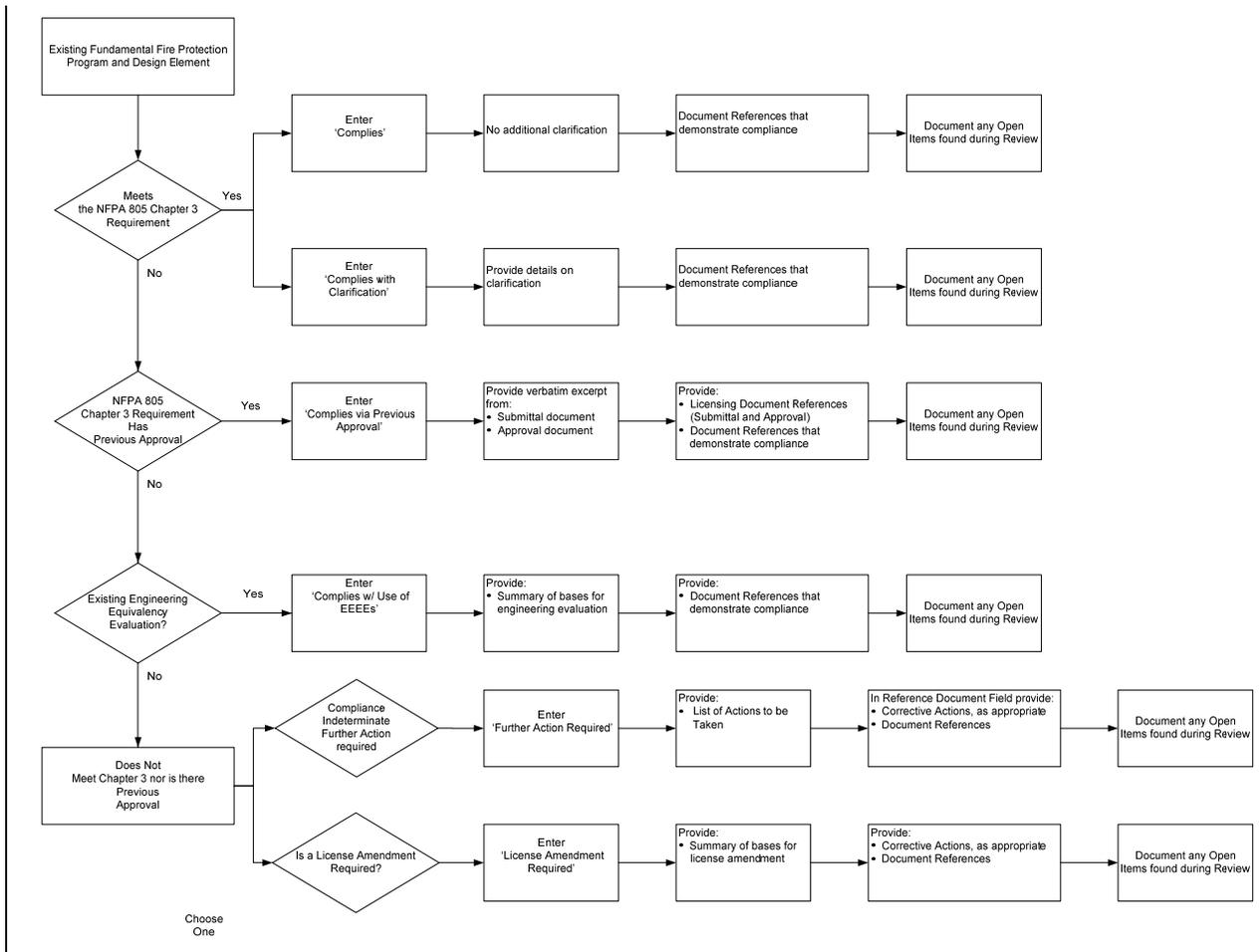


Figure 4-2 - Fundamental Program and Design Elements Transition Process (Simplified)

A systematic approach should be taken when assessing the transitioning plant’s fire protection program against NFPA 805 Chapter 3 requirements. This is necessary to provide clear documentation of acceptance prior to moving forward with a new licensing basis. Specific acceptance of a plant configuration, as well as changes since original acceptance, should be documented. Each section and subsection of Chapter 3 should be reviewed against the current fire protection program. Licensees should provide specific compliance statements (deviations, exemptions, etc) to demonstrate "previous approval" of an alternative or compliance with the Chapter 3 attribute for each Chapter 3 attribute as follows:

- Complies - Items that are transitioning fully compliant “as-is”.
- Complies with Clarification - Items that are not in ‘literal compliance’ with the requirement as listed in NFPA 805 but should be transitioned as complies. For example NFPA 805 specifies that a requirement should be in the pre-plans but the licensee has it in a procedure. This is an editorial issue and compliance should be explained in the compliance basis field.

FAQ Title Incorporation of Pilot Plant Lessons Learned - Table B-1

- [Complies via Previous Approval – Items which previous NRC approval is being claimed or documented.](#)
- [Complies with Use of EEEEs – Items that are transitioning via the use of Existing Engineering Equivalency Evaluations \(EEEs\) or engineering evaluations created during the transition process in accordance with current licensing basis.](#)

Differences from NFPA 805 Chapter 3 identified during the transition review must be reconciled prior to transition to a new NFPA 805 licensing basis. For those cases where compliance cannot be demonstrated, or prior NRC approval is not adequately documented, the licensee may choose to comply with the deterministic requirements of NFPA 805, Chapter 3 or include a performance-based license amendment request with the transition submittal to the NRC.

Guidance on performing and documenting the fundamental element review is provided in Appendix B-1 of this document. A sample [table-report](#) 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.

B Detailed Transition Assessment of Fire Protection Program

B.1 Transition of Fundamental Fire Protection Program and Design Elements

~~Each section and subsection of Chapter 3 is a "Fundamental Fire Protection Program Attribute" defining the program and design elements of a nuclear fire protection program. Cross-reference worksheets included as an addendum (electronically) to Appendix B-1 provide mapping of NFPA 805, Chapter 3, to its applicable 'requirement' in the following documents:~~

- ~~▪ BTP 9.5-1 APCSB 5/1/76 Application Docketed but Construction Permit Not Received as of 7/1/76~~
- ~~▪ BTP 9.5-1 Appendix A 2/24/77 Plants under Construction and Operating Plants~~
- ~~▪ NUREG 0800 BTP 9.5-1 CMEB (Formerly NUREG 75/087) 7/81~~
- ~~▪ 10 CFR 50 Appendix R 9/1/82~~
- ~~▪ Regulatory Guide 1.189-4/2001~~

~~To start the transition process, the transition team must determine the plant's licensing basis. Depending on the vintage of the plant, the plant would have been licensed using one of the following documents:~~

- ~~▪ BTP 9.5-1 APCSB 5/1/76 Application Docketed but Construction Permit Not Received as of 7/1/76~~
- ~~▪ BTP 9.5-1 Appendix A 2/24/77 Plants under Construction and Operating Plants~~
- ~~▪ NUREG 0800 BTP 9.5-1 CMEB (Formerly NUREG 75/087) 7/81~~
- ~~▪ 10 CFR 50 Appendix R 9/1/82~~

~~The transitioning of licensee's licensing basis over to NFPA 805, Chapter 3 should be relatively straightforward because of existing comparison documents. Most plants have their licensing basis documented with a comparison against BTP 9.5-1, Appendix A or NUREG-0800 and the NFPA 805 Chapter 3 requirements are similar to those requirements. Therefore, the transitioning of the licensee's licensing basis over to NFPA 805, Chapter 3 should be relatively straightforward. The team performing the NFPA 805, Chapter 3 transition should possess a detailed knowledge of all aspects of the stations licensing basis, active and passive fire protection features and the programmatic/procedural aspects of the fire protection program.~~

~~Using the Licensing Basis Documentation as it relates to the appropriate licensing documents (e.g., BTP 9.5-1, Appendix A), the transition team should systematically step through the requirements outlined in NFPA 805, Chapter 3. The steps to be used in developing the Chapter 3 Fundamentals Transition Package are shown in the flowchart depicted in Figure 4-2.~~

~~Using the current licensing basis documentation, the transition team systematically steps through the requirements outlined in NFPA 805, Chapter 3. Each of the Chapter 3 Fundamental~~

Elements is reviewed and the basis for compliance documented. The basis for compliance shall be either:

- Literal compliance with the requirement as listed in NFPA 805, which includes compliance with intent (e.g., NFPA 805 specifies a requirement should be in the pre-plans but the licensee has it in a procedure).
- Previous approval as documented in an NRC Safety Evaluation.
- For fundamental elements that can be transitioned over using engineering evaluations (existing or created during the transition) that have been made in accordance with an appropriate application of the currently deterministic guidelines (e.g., Generic Letter 86-10), and evaluated under the requirements of 10 CFR 50.59, or the fire protection standard license condition (Fire Protection Program Reviews), be considered acceptable for transition to the new fire protection licensing basis (FAQ 06-0008) These engineering evaluations will not be considered a change nor would they require NRC approval.

For fundamental elements that do not have one of these methods of compliance demonstrated, one of the following options should be chosen:

- Determine if the plant / program should be brought into compliance with the NFPA 805 requirements.
- Determine if this issue will be included in the transition License Amendment.

The review results should be documented in a retrievable form (e.g., relational database). The following considerations should be made when documenting ‘compliance statements’ to NFPA 805 Chapter 3:

- The use of the following terminology for documenting the ‘level’ of compliance with NFPA 805 Chapter 3
 - Complies - Items that are transitioning fully compliant “as-is”.
 - Complies with Clarification - Items that are not in ‘literal compliance’ with the requirement as listed in NFPA 805 but should be transitioned as complies. For example NFPA 805 specifies that a requirement should be in the pre-plans but the licensee has it in a procedure. This is an editorial issue and compliance should be explained in the compliance basis field.
 - Complies via Previous Approval – Items which previous NRC approval is being claimed or documented.
 - Complies with Use of EEEEs – Items that are transitioning via the use of Existing Engineering Equivalency Evaluations (EEEEs).
- When claiming previous approval, excerpts from the NRC documents that provided the formal approval shall be included in documentation, as well as appropriate excerpts from licensee’s submittals

FAQ Title Incorporation of Pilot Plant Lessons Learned - Table B-1

- 'Gray areas' may arise during the determination of previous NRC approval. Refer to Section 2.3 of this document for guidance on this determination of what constitutes previous NRC approval. In addition, Section 2.4 of Regulatory Guide 1.205, Revision 0, provides additional guidance.
- For each Reference Document that is referenced as part of the transition review, provide sufficient documentation to provide traceability back to the determination. For example, provide, as appropriate, information such as revision number, date, and section/page number in order to make the statements as clear as possible to facilitate reviews and long term configuration management.
- Some areas of the reviews may only be applicable to a single unit or to one or more fire areas. During review of the NFPA 805 Chapter 3 sections, applicability of specific compliance statements to specific unit(s) or fire area(s) should be documented.

The following is an example of a report of the information necessary for the transition report.

~~–The Appendix B-1 Tables should be used to determine the sections of appropriate guidance document (e.g., BTP 9.5-1, Appendix A) that map to NFPA 805, Chapter 3. This mapping will enable the team to pinpoint the sections in guidance document (e.g., BTP 9.5-1, Appendix A) that would satisfy the requirements in NFPA 805. This appropriate information from the station's licensing basis documentation should be summarized and entered into the "Appendix B-1 Transition of Fundamental Fire Protection Program and Design Elements NFPA 805, Chapter 3 worksheets.~~

~~As the team identifies items that did not strictly meet the requirements outlined in NFPA 805, Chapter 3, they should determine if the station licensing basis could be transitioned over to NFPA 805, Chapter 3 because the NRC had previously approved an alternative compliance strategy. For example, if a licensee uses non-UL listed fire pumps, and this fact had been provided to the NRC during the licensing process and was discussed in the Station's Safety Evaluation Report(s), the previously approved alternative compliance will be carried over to NFPA 805, Chapter 3 as a previously approved alternative compliance. The rationale and documentation used to make the decision should be well documented in the worksheets. Exceptions and clarifications identified during the transition review should be documented in order to provide a well-established baseline for future changes.~~

~~Existing Generic Letter 86-10 evaluations, which evaluate deviations from NFPA 805 Chapter 3 requirements, must be submitted to the NRC for approval as a license amendment if they do not meet the License Amendment Request threshold discussed in Section 5.3.2.~~

~~Included in Table B-1 is the mapping of the Fire Protection Fundamentals for "water supply" for a plant licensed to BTP 9.5-1 APCS 5/1/76 Application Docketed but Construction Permit Not Received as of 7/1/76. This mapping will be done for each section of Chapter 3 of NFPA 805. An example of how a licensee would map over the first 2 sections is provided. Once this mapping is completed all previous commitments will be superseded by compliance with the new rule.~~

Table B-1—Transition of Fundamental Fire Protection Program and Design Elements Worksheet Example

<p><u>NFPA 805</u> <u>Chapter 3 Fundamental Fire Protection</u> <u>Program and Design Elements</u></p>	<p><u>Mapped to BTP 9.5-1 APCSB</u> <u>5/1/76</u> <u>Application Docketed but</u> <u>Construction Permit Not Received</u> <u>as of 7/1/76</u></p>	<p><u>Compliance Statement</u></p>	<p><u>Current Licensing Basis Document</u> <u>Identification</u></p>
<p>3.5 Water Supply. 3.5.1 A fire protection water supply of adequate reliability, quantity, and duration shall be provided by one of the two following methods.</p> <p>(a) Provide a fire protection water supply of not less than two separate 300,000-gal (1,135,500-L) supplies.</p> <p>(b) Calculate the fire flow rate for 2 hours. This fire flow rate shall be based on 500 gpm (1892.5 L/min) for manual hose streams plus the largest design demand of any sprinkler or fixed water spray system(s) in the power block as determined in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, or NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection. The fire water supply shall be capable of delivering this design demand with the hydraulically least demanding portion of fire main loop out of service.</p>	<p>IV.C.2. (d) Two separate reliable water supplies should be provided. If tanks are used, two 100% (minimum of 300,000-gallons each) system capacity tanks should be installed. They should be so interconnected that pumps can take suction from either or both. However, a leak in one tank or its piping should not cause both tanks to drain. The main plant fire water supply capacity should be capable of refilling either tank in a minimum of eight hours. Common tanks are permitted for fire and sanitary or service water storage. When this is done, however, minimum fire water storage requirements should be dedicated by means of a vertical standpipe for other water services.</p> <p>IV.C.2. (e) The fire water supply (total capacity and flow rate) should be calculated on the basis of largest</p>	<p>The fire water storage system consists of two dedicated fire water storage tanks sized at 350,000 gallons each.</p> <p>The fire pumping system consists of two 100% capacity pumps, one diesel driven and one motor driven. The fire pumps are capable of supplying the most hydraulically demanding sprinkler system while flowing 500 gpm for hose stations considering the most hydraulically demanding portion of the fire main system out of service. The fire water storage tanks were sized on the basis of the largest expected flow rate for a period of 2.5 hours.</p> <p>The fire water pumping system is designed in accordance with NFPA 20.</p>	<p>UFSAR Volume 9, Fire Hazards Analysis, Section 9.5-1, page 34.</p> <p>NRC Safety Evaluation Report, page 44-45.</p> <p>P&ID 8031-M-22, Page 2 of 10</p> <p>Under Turbine System WP10-2 Hydraulic Calculation (Largest Demand System), M50-22-21.</p> <p>XYZ Letter to NRC, FP25, 5/15/72</p> <p>NRC Letter to XYZ, 6/28/72.</p>

Table B-1—Transition of Fundamental Fire Protection Program and Design Elements Worksheet Example

<p><u>NFPA 805</u> <u>Chapter 3 Fundamental Fire</u> <u>Protection</u> <u>Program and Design Elements</u></p>	<p><u>Mapped to BTP 9.5-1 APCSB</u> <u>5/1/76</u> <u>Application Docketed but</u> <u>Construction Permit Not Received</u> <u>as of 7/1/76</u></p>	<p><u>Compliance Statement</u></p>	<p><u>Current Licensing Basis Document</u> <u>Identification</u></p>
	<p>expected flow rate for a period of two hours, but not less than 300,000 gallons. This flow rate should be based (conservatively) on 1,000 gpm for manual hose streams plus the greater of:</p> <p>(1) all sprinkler heads opened and flowing in the largest designed fire area; or</p> <p>(2) the largest open head deluge system(s) operating.</p>		

FAQ Title Incorporation of Pilot Plant Lessons Learned - Table B-1

Table B-1 - NFPA 805 Ch. 3 Transition

<u>NFPA 805 Ch. 3 Ref.</u> 3.3.5.3 [Electrical Cable Flame Propagation Limits]	<u>Requirements/Guidance</u> 3.3.5.3*	<u>Compliance Statement</u> Complies via Previous Approval	<u>Compliance Basis</u> From Fire Protection SER dated 3/21/79 Section 3.1.14 Modifications "3.1.14 Fire Retardant Cable Coatings" Cables in trays with safe shutdown related cables in the following areas will be covered with a flame retardant coating: (1) Inverter room (5.3) (2) Containment (5.10) (3) Lower level of turbine area (5.12) (4) Auxiliary feed pump area (5.12) (5) In the vicinity of the condensate storage tank and transfer pumps (5.13) 4.8 Electrical Cables	<u>Reference Document</u> Fire Protection Safety Evaluation Report, Fire Protection Safety Evaluation Report, Rev. 0, 3/21/1979	<u>Document Detail</u> Section 3.1.1.4
	<p>Electric cable construction shall comply with a flame propagation test as acceptable to the AHJ.</p> <p>Exception: Existing cable in place prior to the adoption of this standard shall be permitted to remain as it is.</p>		<p>"The cable insulation used in the plant consists of butyl rubber and polyethylene insulated conductors. Cables routed in the containment have cross linked polyethylene insulated conductors. Most cable jackets are polyvinyl chloride with some cables having neoprene jackets. The flame test standard for cables, IEEE Std. 383-1974, was not in effect at the time cables were purchased and installed. Flame retardant coatings have been used extensively and in all areas of high cable concentration to reduce the fire hazards associated with combustible insulation materials.</p> <p>We find that the use of fire retardant coatings adequately addresses the combustible characteristics of cable insulation materials in some areas. With the exception of the open items (3.2.4, 3.2.5) this satisfies the objectives identified in Section 2.2 of this report and is therefore acceptable. We will report on these open items in a supplement to this report."</p> <p>UFGAR Section 9.6A states "Plant design minimizes the use of combustible materials. Cables within certain areas are generally coated with a fire retardant coating or are qualified to IEEE 383-1974, or UL-910 per Reference 46"</p>		