Progress Energy

Shearon Harris Nuclear Power Plant

Docket 50-400

Transition to 10 CFR 50.48(c) - NFPA 805

***Performance- Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants,* 2001 Edition**

Transition Report

Revision 0a

May 31, 2008

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Executive Summary

[To be completed later]

1.0 INTRODUCTION

The Nuclear Regulatory Commission (NRC) has adopted a voluntary alternative rule for fire protection requirements at nuclear power plants, 10 CFR 50.48(c). Progress Energy has implemented the process for transitioning from its current fire protection licensing basis for the Shearon Harris Nuclear Power Plant (HNP) to compliance with the new requirements. This document describes the transition process that applied by Progress Energy for HNP and the results that demonstrate compliance with the new voluntary requirements.

[Note: A sample Transition Report outline is included in NEI 04-02, Revision 1, Appendix H. This report used this sample as an initial guide. However, lessons learned from the Pilot Plant transition experience were used to improve the Transition Report content.]

1.1 Background

1.1.1 NFPA 805 – Requirements and Guidance

On July 16, 2004 the Nuclear Regulatory Commission amended 10 CFR Part 50.48, *Fire Protection*, to add a new subsection, 10 CFR 50.48(c), that established acceptable fire protection requirements. The change to 10 CFR 50.48 endorses, with exceptions, the National Fire Protection Association's 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants – 2001 Edition* (NFPA 805), as a voluntary alternative for demonstrating compliance with 10 CFR 50.48 Section (b) and Section (f).

As stated in 10 CFR 50.48 (c)(3)(i), any licensee's adoption of a risk-informed, performance-based program that complies with the rule is voluntary. Compliance with this rule may be adopted as an acceptable alternative method for complying with either 10 CFR 50.48 (b), for plant licensed to operate before January 1, 1979, or the fire protection license conditions for plants licensed to operate after January 1, 1979, or 10 CFR 50.48 (f), plants shutdown in accordance with 10 CFR 50.82(a)(1).

The Nuclear Energy Institute (NEI) developed NEI 04-02, *Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48(c)*, to assist licensees in adopting NFPA 805 and making the transition from their current fire protection licensing basis to one based on NFPA 805. The Nuclear Regulatory Commission (NRC) issued a Regulatory Guide 1.205, *Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants*, which endorses NEI 04-02, in May 2006.

A depiction of the primary document relationships is shown below:

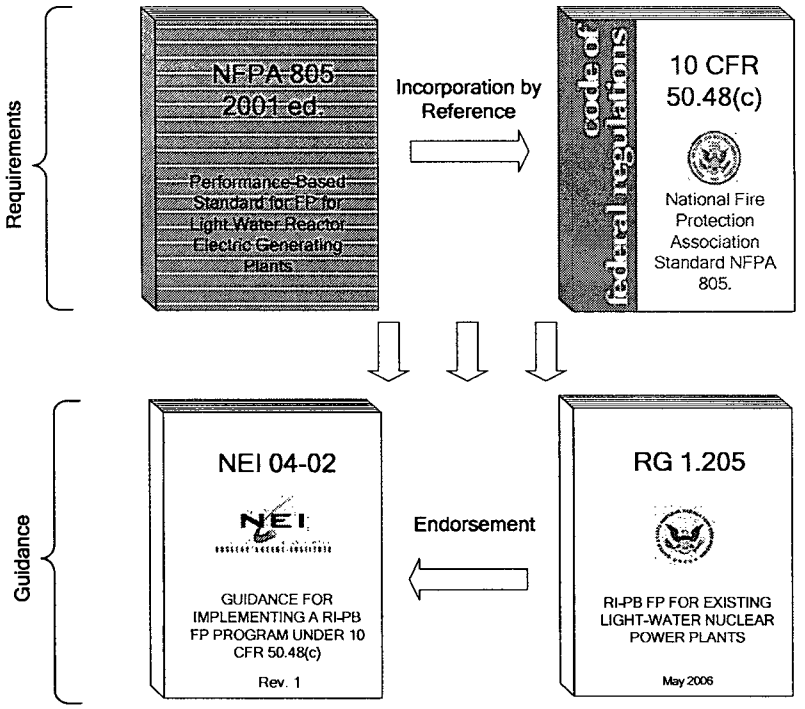


Figure ?? NFPA 805 Transition – Implementation Requirements / Guidance

1.1.2 HNP Transition to 10 CFR 50.48(c)

1.1.2.1 Start of Transition

HNP determined to transition its fire protection licensing basis to the performance-based alternative in 10 CFR 50.48(c). A letter of intent was submitted by Progress Energy to the NRC on June 10, 2005 (ADAMS Accession No. ML051720404) for HNP to adopt NFPA 805 in accordance with 10 CFR 50.48(c). This letter of intent also addressed other Progress Energy plants (Brunswick Steam Electric Plant, H.B. Robinson Steam Electric Plant, and Crystal River Unit 3 Nuclear Generating Plant). The letter of intent requested three years of enforcement discretion and proposed that HNP be considered a pilot plant for the NFPA 805 transition process.

The NRC responded to Progress Energy on September 19, 2005 (ADAMS Accession No. ML052140391). In the response, the NRC agreed that HNP should be an NFPA 805 Transition Pilot Plant. The NRC also sent a letter to Progress Energy on April 29, 2007, granting a third year of enforcement discretion (ADAMS Accession No. ML070590625).

1.1.2.2 NFPA 805 Pilot Plant Summary

The HNP NPFA 805 transition underwent a series of reviews and observation meetings as part of the Transition Pilot Plant process, with the following goals:

- Increase communication between the NRC and transitioning licensees
- Develop transition lesson learned reports from observation visits
- Improve the NFPA 805 Regulatory Guide and Inspection Procedures
- Gain insights on the Enforcement Discretion Policy

- Develop License Amendment Request and Safety Evaluation Report templates

A summary of the major Pilot Plant activity is shown below:

Item	Date	Location	Summary
1	11/7/05-11/11/05	Charlotte, NC	Pilot Observation Meeting [ML060250033, ML060250034]
2	3/27/06—3/30/06	Raleigh, NC	Pilot Observation Meeting [ML061500468, ML061520285]
3	10/16/06-10/19/06	Seneca, SC (Oconee)	Pilot Observation Meeting [ML070280007, ML070320285]
4	11/6/06-11/8/06	Raleigh, NC	Pilot Observation Meeting [ML063330521, ML070820251, ML063310386, ML071210207, ML071060267]
5	3/6/07-3/8/07	Raleigh, NC	Pilot Observation Meeting / Public Meeting [ML070950030, ML070960489, ML071160447]
6	5/30/07-6/1/07	Raleigh/Apex, NC	Pilot Observation Meeting / Public Meeting [ML071930362, ML071930339]
7	7/10/07-7/13/07	Seneca, SC (Oconee)	Pilot Observation Meeting / Public Meeting [ML072270014, ML072610448, ML072610455, ML072140380]
8	8/6/07-8/9/07	Bethesda, MD	Pilot Observation Meeting / Public Meeting [MLXXXXXXXXX]
9	11/5/07-11/8/07	Atlanta, GA	Pilot Observation Meeting / Public Meeting [MLXXXXXXXXX]
TBD	TBD	TBD	TBD

1.2 Purpose and Scope

The purposes of the HNP Transition Report:

(1) Describe the process implemented by Progress Energy to transition the HNP fire protection program to demonstrate compliance with the requirements in 10 CFR 50.48(c);

(2) Summarize the results of HNP's transition process;

(3) Explain the bases for Progress Energy's conclusions that the HNP fire protection program, with certain modifications, comply with those requirements; and

(4) To describe the new HNP fire protection licensing basis.

2.0 OVERVIEW OF EXISTING FIRE PROTECTION PROGRAM

2.1 Current Fire Protection Licensing Basis

Progress Energy Harris Nuclear Plant's license condition 2.F states:

"F. Fire Protection Program (Section 9.5.1)

Carolina Power & Light Company shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility as amended and as approved in the Safety Evaluation Report (SER) dated November 1983 (and supplements 1 through 4), and the Safety Evaluation dated January 12, 1987, subject to the following provision below. The licensees may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire."

2.2 Applicable Regulatory Requirements

The following encompass the pre-transition HNP fire protection program licensing basis:

[Provide summary of HNP fire protection licensing basis]

2.3 Current Enforcement Discretion

Federal Register Notice, 71 FR 19905, issued on April 18, 2006, extended enforcement discretion for issues identified during transition from 2 years to 3 years. In 71 FR 19905, the NRC provided the following:

"...For those noncompliances identified during the licensee's transition process, this enforcement discretion policy will be in effect for up to 3 years from the date specified by the licensee in their letter of intent to adopt the requirements in 10 CFR 50.48(c), and will continue to be in place, without interruption, until NRC approval of the license amendment request to transition to 10 CFR 50.48(c). This enforcement discretion policy may be extended on a case-by-case basis, by request, with adequate justification, from the licensee...."

The NRC also sent a letter to Progress Energy on April 29, 2007, granting a third year of enforcement discretion (ADAMS Accession No. ML070590625). The expiration date of the enforcement discretion per the April 29, 2007 was June 10, 2008.

Based on the above, enforcement discretion will extended until approval of the HNP 10 CFR 50.48(c) License Amendment.

[Insert summary of additional enforcement request related to completion of plant modifications]

3.0 TRANSITION PROCESS

3.1 Background

The process for transitioning from compliance with the current fire protection licensing basis to the new requirements is described in general in Section 4.0 of NEI 04-02. It contains the following steps: (1) licensee determination to transition the licensing basis and devote the necessary resources to it; (2) Letter of Intent to the NRC stating the licensee's intention to transition the licensing basis in accordance with a tentative schedule; (3) licensee conduct of the transition process to determine the extent to which the current fire protection licensing basis supports compliance with the new requirements and the extent to which additional analyses, plant and program changes, and alternative methods and analytical approaches are needed; (4)

filing of License Amendment Request (LAR); and (5) completion of transition activities and adoption of the new licensing basis consistent with the NRC's grant of the license amendment.

3.2 NFPA 805 Process

Section 2.2 of NFPA 805 establishes the general process for demonstrating compliance with NFPA 805. The process is illustrated in Figure 2.2 of NFPA 805 (with cross-references to the applicable sections of NFPA 805 Section 2.2).. It shows that except for the fundamental fire protection requirements, compliance can be achieved on a fire area basis either by deterministic or performance-based methods. (The NRC permits licensees to use performance-based methods to comply with the fundamental fire protection requirements but those applications must be approved through the NRC's license amendment process, as discussed above.) HNP implemented this process by first determining the extent to which its current fire protection program supported findings of deterministic compliance with the requirements in NFPA 805. Risk-informed, performance-based methods were then applied to the requirements for which deterministic compliance could not be shown.

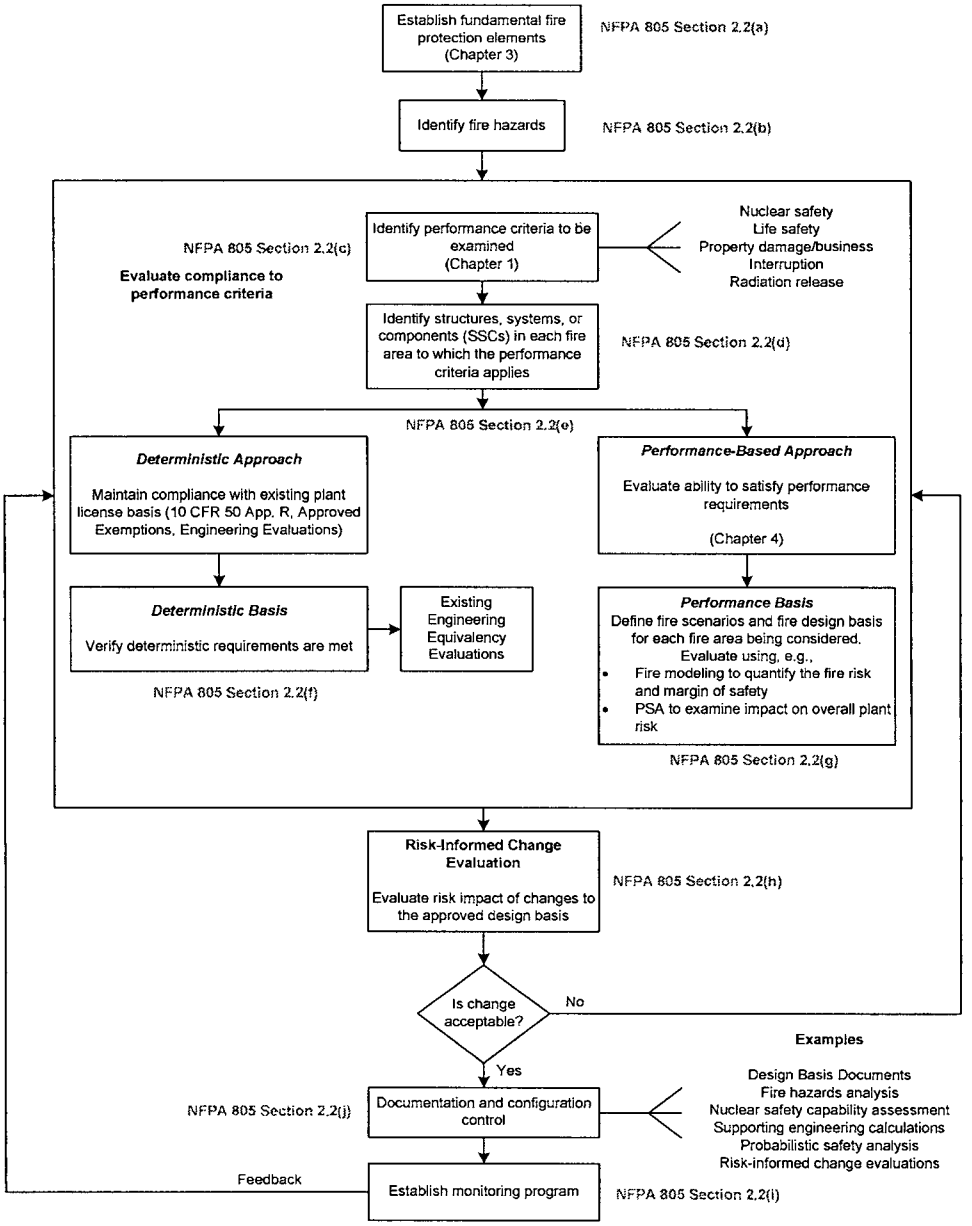


Figure ?? NFPA 805 Process [NEI 04-02 Figure 3-1]

3.3 NEI 04-02 – NFPA 805 Transition Process

NFPA 805 contains technical processes and requirements for a risk-informed, performance-based fire protection program. NEI 04-02 was developed to provide guidance on the overall process (programmatic, technical, and licensing) of the transition from a traditional fire protection licensing basis to a new one based upon NFPA 805, as shown below in Figure 3-2.

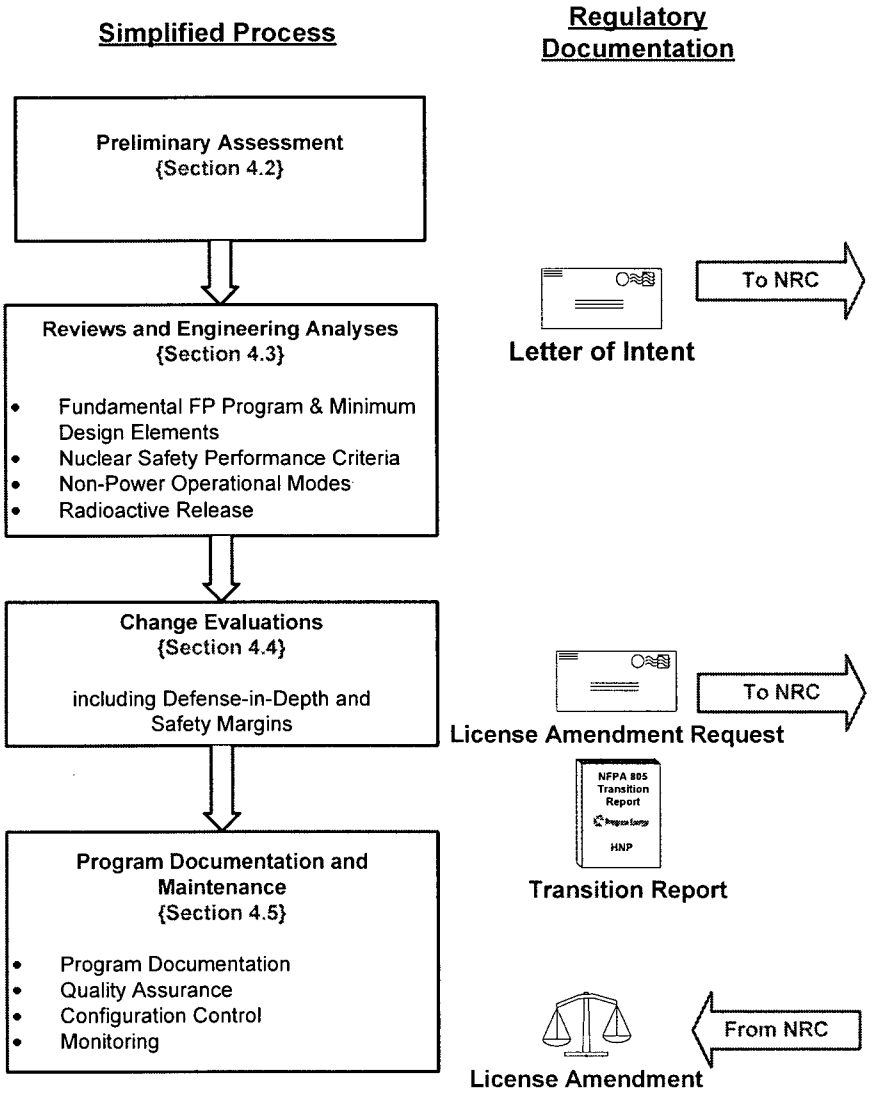
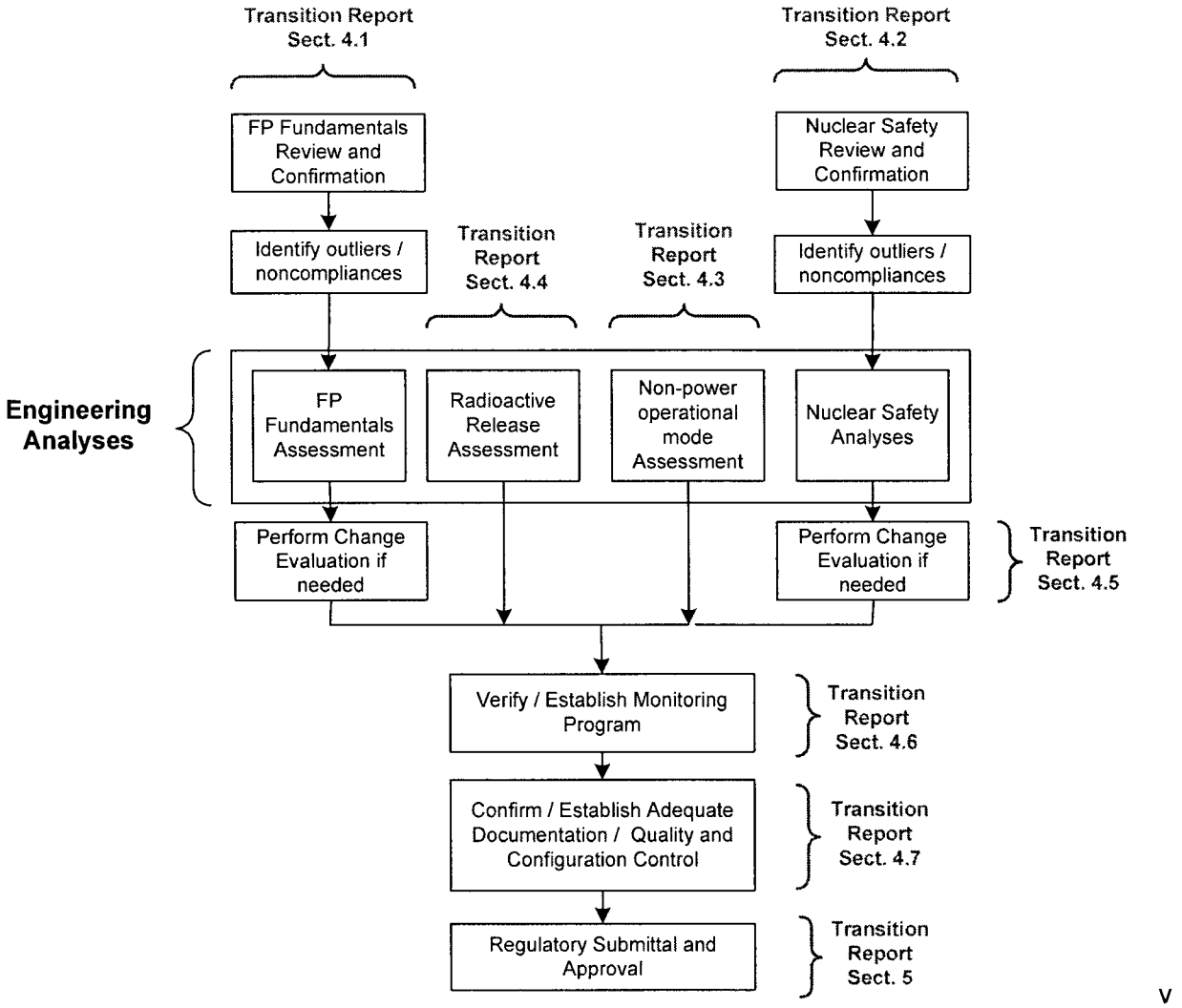


Figure ?? Implementing the New Licensing Basis [NEI 04-02 Figure 3-3]

Section 4.0 of NEI 04-02 describes the detailed process for assessing a fire protection program for the extent to which it supports a showing of compliance with NFPA 805, as shown below in Figure 3-3. HNP conducted the detailed evaluation processes by establishing teams comprised of knowledgeable plant personnel. The assessment processes used by these teams and the results of the assessments are discussed in detail below.



Figure?? Transition Process (Simplified) [based on NEI 04-02 Figure 4-1]

3.4 NEI 04-02 Frequently Asked Questions (FAQs)

The NRC staff is worked with two pilot plants (HNP and Oconee Nuclear Station) to refine the infrastructure that facilitated the transition to the new licensing basis. Both the NRC staff and the industry recognized the need for additional clarifications and guidance beyond that provided in Regulatory Guide 1.205 and NEI 04-02, Revision 1. In a letter to the NRC, the NEI requested that the NRC staff establish a process that provides timely clarifications of additional staff positions usually communicated via RG 1.205 and NEI 04-02. The NRC staff accepted an NEI proposal on a proposed process, with several modifications, as described in a July 12, 2006, letter to NEI (ADAMS Accession No. ML061660105). This process was named the NFPA 805 Frequently Asked Question (FAQ) Process. The process was intended to as a structured avenue to seek NRC staff interpretations and clarifications of NEI 04-02 guidance and NFPA 805 requirements, in accordance with 10 CFR 50.48(c), in a timely manner.

Under the FAQ Process, transition issues (referred to as FAQs) requiring additional clarifications were submitted, in accordance with the above proscribed process, to the NEI NFPA 805 Task Force for review, and subsequently presented to the NRC during public FAQ meetings. The process continued with written comments from the NRC, when appropriate, and formal revisions of the FAQs. Once an acceptable FAQ is submitted to the NRC, the NRC staff issued a publicly available memorandum to file which indicated that the revised FAQ is acceptable guidance for transitioning to NFPA 805, and should be incorporated into NEI 04-02. These closure memos are preliminary extensions of the implementation guidance in NEI 04-02. Final official closure of the FAQs occurs when an updated Regulatory Guide 1.205, endorsing the revised NEI 04-02, is approved by the NRC.

The FAQs in Table **[????]** in Appendix I were used as guidance as part of the HNP transition to NFPA 805.

4.0 DEMONSTRATIONS OF COMPLIANCE WITH NFPA 805 REQUIREMENTS

4.1 Fundamental Fire Protection Program Elements and Minimum Design Requirements

The Fundamental Fire Protection Program and Design Elements are established in Chapter 3 of NFPA 805. Section 4.3.1 of NEI 04-02 (Implementing Guide) sets out a systematic process for determining the extent to which the current licensing basis meets these criteria and for identifying the fire protection program changes that would be necessary for complete compliance. Appendix B-1 of the Implementing Guide provides a worksheet tool to document the comparison of the Fire Protection Program Fundamentals of Chapter 3 to NFPA 805 to the appropriate NRC Guidance Documents (BTP9.5-1, NUREG 0800, etc.). The completed worksheet is included as Appendix A to the Transition Report. The results of the transition review are summarized below.

4.1.1 Overview of Evaluation Process

The comparison of the HNP Fire Protection Program to NFPA 805 Chapter 3 (NEI 04-02 Table B-1) was performed using the methodology contained in Progress Energy Fire Protection Initiatives Project (FPIP) Project Instruction FPIP-0120, NFPA 805 Chapter 3 Fundamental Transition, and the guidance contained in FAQ 07-0036, Incorporation of Pilot Plant Lessons Learned - Table B-1. The methodology steps, depicted in **[Figure ???]**, are outlined below.

- Step 1 - Assemble documentation.
- Step 2 - Determine level of compliance. Review each section and subsection of NFPA 805 Chapter 3 against the current fire protection program. Provide specific compliance statements as follows:
  - Complies
  - Complies with Clarification
  - Complies Via Previous NRC Approval
  - Complies with Use of Existing Engineering Equivalency Evaluations (EEEEs)
- Step 3 – Document the results of the review.

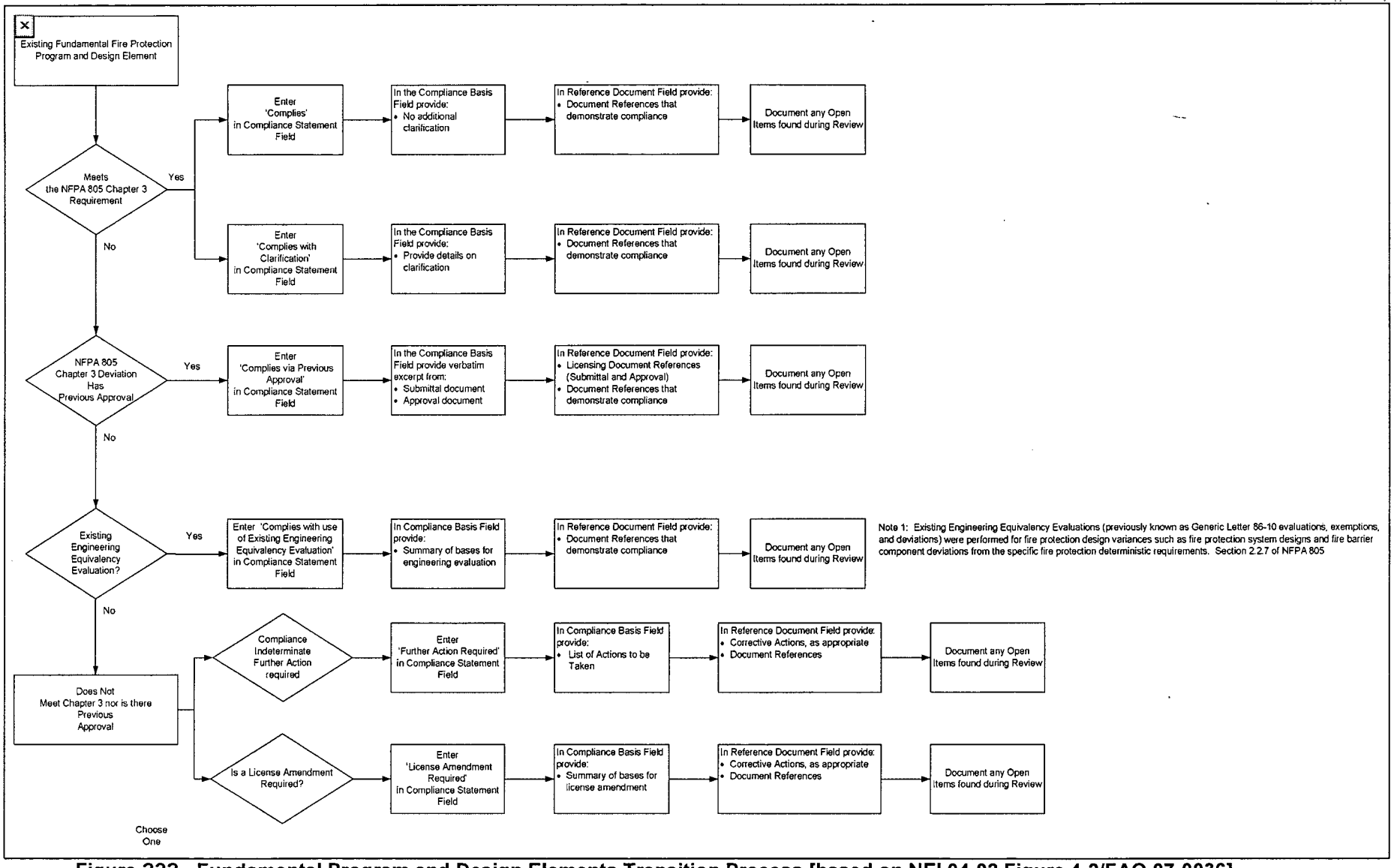


Figure ??? - Fundamental Program and Design Elements Transition Process [based on NEI 04-02 Figure 4-2/FAQ 07-0036]

4.1.2 Results from Evaluation Process

4.1.2.1 NFPA 805 Chapter 3 Requirements Met or Previously Approved by the NRC

Requirements in NFPA 805 Chapter 3 that are met or for which the NRC previously approved alternatives are included in Appendix A to the Transition Report. References to the document(s) that justify that position are included.

4.1.2.2 NFPA 805 Chapter 3 Requirements not Previously Approved by NRC

[Optional] For the following items in Chapter 3, no previous NRC approvals of alternatives were discovered:

[List]

Compliance for these requirements was demonstrated in some cases by showing deterministically that the requirement could be met by the plant as currently configured.

[List with explanations]

For the cases where compliance could not be demonstrated deterministically, risk-informed, performance-based alternatives were used to demonstrate compliance.

[List each requirement and briefly describe the performance-based method used to demonstrate compliance]

4.2 Nuclear Safety Performance Criteria Transition Review

4.2.1 Nuclear Safety Methodology Review

4.2.1.1 Overview of Evaluation Process

The comparison of the HNP Fire Protection Program to NEI 00-01 Chapter 3 (NEI 04-02 Table B-2) was performed using the methodology contained in Project Instruction FPIP-0127, NFPA 805 Nuclear Safety Capability Assessment Transition Review, and the guidance contained in FAQ 07-0039, Lessons Learned – NEI 04-02 B-2 and B-3 Tables. The methodology steps depicted in [Figure], are outlined below.

Step 1 – Assemble documentation. Gather industry and plant-specific information.

Step 2 – Determine and document NEI 00-01 applicability of NEI 00-01 sections. Correlate the NFPA 805 2.4.2 section to the corresponding section of NEI 00-01 Chapter 3. Based upon the content of the NEI 00-01 methodology statements, determine if the section is applicable to the plant.

Step 3 – Perform comparison of plant-specific safe shutdown methodology to applicable sections of NEI 00-01. Determine if failure to maintain strict alignment with the guidance in NEI 00-01 could have adverse consequences. Document whether the plant aligns with the NEI guidance and provide the basis for the alignment statement.

Step 4 – Document Open Items associated with the review of the NEI 00-01 guidance.

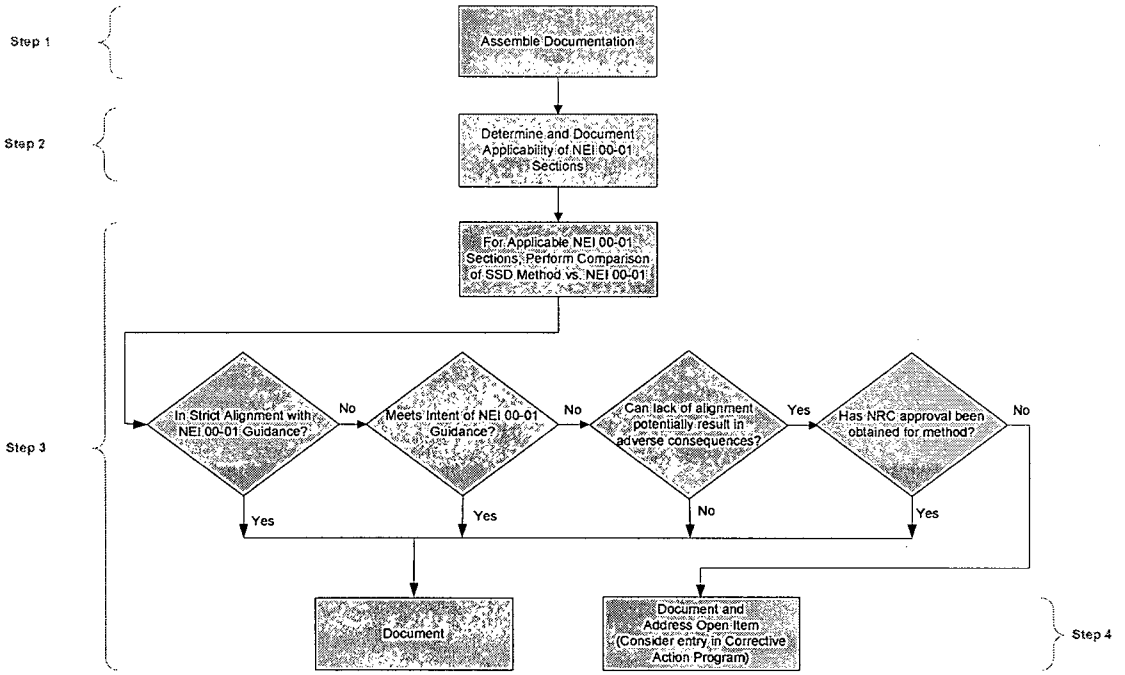


Figure ??– Summary of Nuclear Safety Methodology Review Process (FAQ 07-0039)

4.2.1.2 Results from Evaluation Process

[To be completed later]

4.2.2 Fire Area-by-Fire Area Transition

4.2.2.1 Overview of Evaluation Process

The Fire Area – by – Fire Area Transition of the HNP Fire Protection Program (NEI 04-02 Table B-3) was performed using the methodology contained in Project Instruction FPIP-0127, NFPA 805 Nuclear Safety Capability Assessment Transition Review, and the guidance contained in FAQ 07-0039, Lessons Learned – NEI 04-02 B-2 and B-3 Tables. The methodology steps for performing the Fire Area - by - Fire Area Transition depicted in **[Figure ???]**, are outlined below.

Step 1 - Assemble documentation. Gather industry and plant-specific fire area analysis analytical and licensing basis documents.

Step 2 – Assess accomplishment of performance goals. Document the fulfillment of the NFPA 805 performance goals for the selected fire area. Also document the method of accomplishment in summary level form for the fire area.

Step 3 – Perform Fire Area Licensing Action Review. Perform a review of the licensing aspects of the selected fire area and document the results of the review.

Step 4 – Perform Engineering Evaluation Review. Perform a review of appropriate engineering evaluations to determine and assess the basis for acceptability. Document the purpose of the evaluation and the review.

Step 5 – Document results and define Open Items / Change Evaluations. This step includes documenting Fire Protection Systems and Features Determination, Fire Suppression Activities, and Open Items / Change Evaluations.

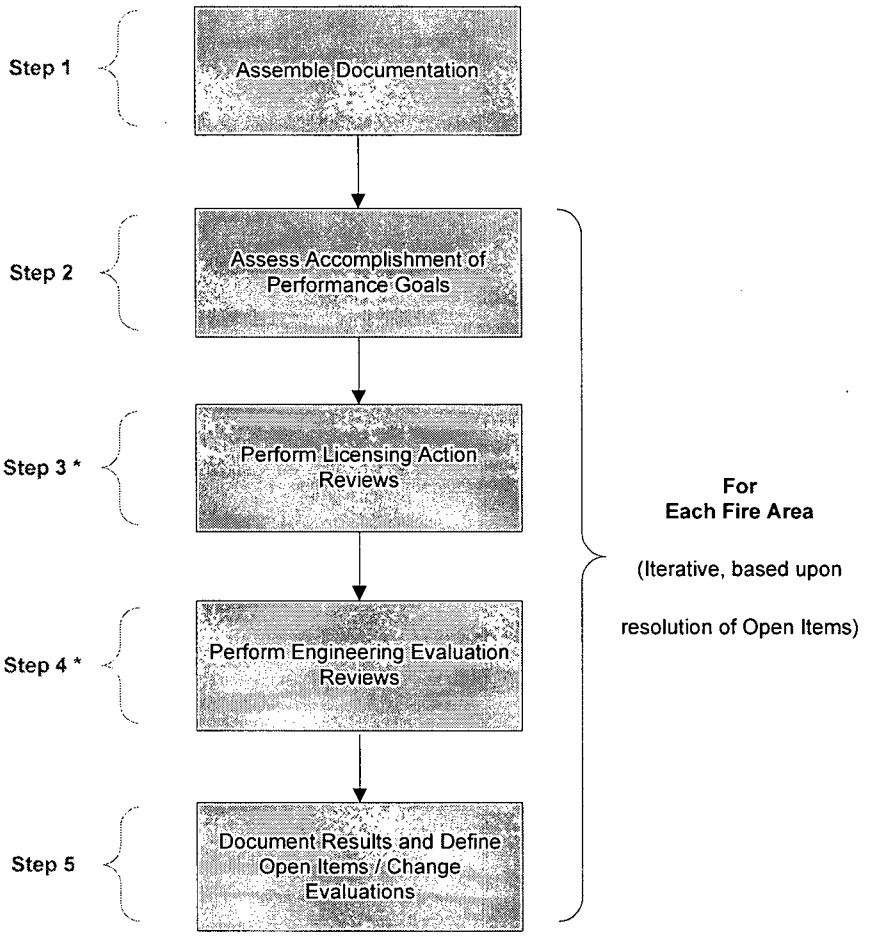


Figure ?? – Summary of Fire Area-by-Fire Area Review (FAQ 07-0039)

4.2.2.2 Results from Evaluation Process

[To be completed later]

4.3 Non-Power Operational Modes

4.3.1 Overview of Evaluation Process

The review of the HNP Fire Protection Program against NFPA 805 requirements for High Risk Evolutions performed during non-power operational modes (NEI 04-02 Table F-1) was performed using the methodology contained in Project Instruction FPIP-0126, Non-Power

Operational Modes Transition Review. The methodology steps depicted in [Figure], are outlined below.

Step 1 - Review plant outage process. The purpose of this review is to identify those systems and equipment that are relied upon to provide Key Safety Functions (KSF) during each outage evolution.

Step 2 - Identify required equipment. For systems relied upon to achieve, or support, one or more of the outage evolutions, and the Key Safety Functions, identify the components required for each of the high risk outage evolutions.

Step 3 – Perform circuit analysis. For each new electrically operated component that is added to perform, or support, an outage function, a circuit analysis shall be completed and documented.

Step 4 – Identify equipment/cable or recovery action location.

Step 5 – Perform Fire Area Assessment. Identify those areas where a single fire might damage (or impede) all credited paths, or affect recovery actions used to perform a KSF. For those fire areas where a single fire may damage all credited paths used to perform a KSF, consider and incorporate options into the outage management and planning procedures to reduce the risk from fire depending upon the significance of the potential damage:

Step 6 – Prepare documentation. Summarize the results of this fire area assessment, and document the vulnerabilities identified. This report shall also include any recommendation for modifying procedures utilized to manage risk during plant shutdown and outage periods to ensure that Key Safety Functions are not compromised in the event of a fire during high risk evolutions. Include summary of the tasks that were performed to demonstrate that the nuclear safety performance criteria are met for High Risk Evolutions that are performed during non-power operational modes.

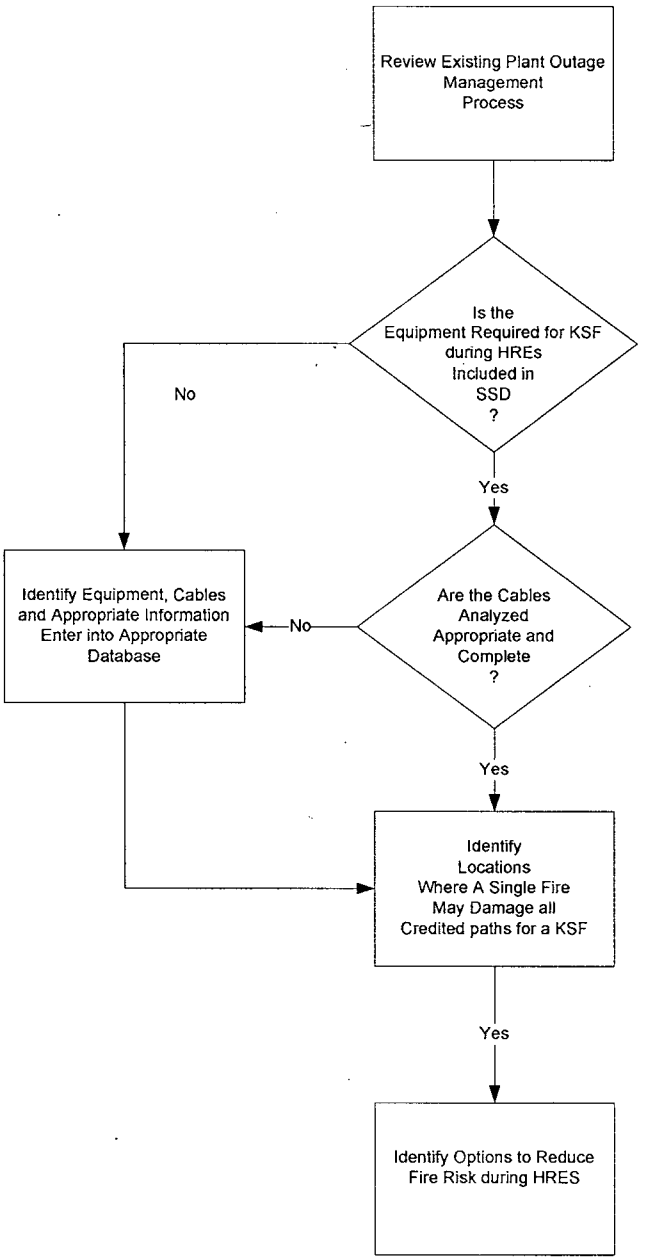


Figure ?? – Non-Power Operational Modes Review Process

4.3.2 Results from Evaluation Process

[To be completed later]

4.4 Radioactive Release Performance Criteria

4.4.1 Overview of Evaluation Process

The review of the HNP Fire Protection Program against NFPA 805 requirements for fire event and fire suppression related radioactive release (NEI 04-02 Table G-1) was performed using the

methodology contained in Project Instruction FPIP-0121, Radiological Release Reviews During Fire Fighting Operations. The methodology steps are outlined below.

Step 1 - Perform Pre-Fire Plan review. Review the site pre-fire plans for locations that have the potential for radiological contamination. The review shall be conducted by an "expert panel" to ensure specific steps are included for containment and monitoring of potentially contaminated materials.

Step 2 - Perform Fire Brigade Training Plan review. The site fire brigade training materials shall be reviewed by an "expert panel" to ensure specific steps are included for dealing specifically with containment and monitoring of potentially contaminated materials and monitoring of potentially contaminated fire suppression products following a fire event.

Step 3 – Establish engineering controls. During the expert panel review process, determine if Engineering Controls could be established to minimize the release of radioactive materials (e.g. smoke and /or contaminated water).

Step 4 – Provide documentation.

4.4.2 Results from Evaluation Process

[To be completed later]

4.5 Change Evaluations / Plant Modifications

4.5.1 Fire PRA Development and Acceptance

[LATER – Discuss HNP Fire PRA development, reviews and results from the NRC 'acceptance' review, high level findings, etc. and how this process establishes the foundation for the new post-transition fire protection license condition and use in the change evaluation process in RG 1.205]

4.5.2 Risk-Informed, Performance-Based Change Evaluation Process

Risk-Informed, performance-based change evaluations were performed as part of the HNP NFPA 805 transition. Progress Energy project instruction FPIP-0128, NFPA 805 Change Evaluations, was developed based upon the industry guidance in primary documents NFPA 805, NEI 04-02 Revision 1, and Regulatory Guide 1.205, Revision 0.

Document	Section(s)	Topic
NFPA 805	2.2(h), 2.2.9, 2.4.4, 4.2.4, A.2.2(h), A.2.4.4, D.5	Change Evaluation Risk of Recovery Actions (4.2.4)
NEI 04-02 Revision 1	4.4, 5.3, Appendix B, Appendix I, Appendix J	Change Evaluation, Change Evaluation Forms (App. I)
Reg. Guide 1.205 (May 2006)	B.2.2, B.2.3, C.3.2	LAR reporting requirements (B.2.2) Risk of operator manual actions (B.2.3) Change Evaluations (C.3.2) Circuit Analysis (C.3.3) PSA Peer Review (C.4.3)

The Plant Change Process consists of the following subtasks:

- Change Definition
- Preliminary Risk Review
- Risk Evaluation
- Acceptability Determination

4.5.2.1 Change Definition

The Change Evaluation process started with definition of the change or altered condition to be examined and the baseline configuration as defined by the Licensing Basis (current pre-transition licensing basis).

4.5.2.2 Preliminary Risk Review

Once the definition of the change is established and groupings/organizations are established, a preliminary risk review was performed to identify and resolve minor changes to the fire protection program.

4.5.2.3 Risk Evaluation

For changes that were not determined to be minor, the changes were assessed using risk-informed, performance-based techniques (including, but not limited to fire modeling and PRA). The risk evaluations, depending upon the nature of the change, were performed as either limiting or bounding fire modeling/fire risk analysis or detailed integrated analyses.

4.5.2.4 Acceptability Determination

The risk evaluation shall be measured quantitatively for acceptability using the ΔCDF and ΔLERF criteria from Regulatory Guide 1.174, as clarified in Section 5.3.5 of NEI 04-02 and Regulatory Guide 1.205. The results of the acceptability determination were documented in calculations. An evaluation to ensure maintenance of defense-in-depth and safety margins was also performed.

4.5.3 Risk-Informed, Performance-Based Change Evaluation Results

HNP's pre-transition post-fire safe shutdown analysis revalidation efforts and the NFPA 805 transition project activities have a identified a number of variances from the pre-transition fire protection licensing basis. These variances have been and are being addressed by a number of plant and programmatic changes to correct the variances and reduce risk.

Following completion of transition activities and planned modifications and program changes outlined in Section 4.5.3, the plant is compliant with 10 CFR 50.48(c).

In accordance with the guidance in Regulatory Position C.2.2 of Regulatory Guide 1.205, the total risk increase associated with all fire protection program noncompliances (based on current 'pre-transition' deterministic regulations) that are not intended to be brought into compliance and the total risk change associated with plant changes planned for NFPA 805 transition was estimated.

In accordance with the requirements and guidance contained in NFPA 805, NEI 04-02 Revision 1 and Regulatory Guide 1.205, the changes associated the HNP transition to NFPA 805 were determined to be acceptable, based upon the following:

The estimated change in risk associated with transition to NFPA 805 is estimated to be:

- Less than X x 10^{-X} change in core damage frequency/year (ΔCDF/yr)
- Less than X x 10^{-X} change in large early release frequency/year (ΔLERF/yr)

In addition, the changes associated with transition to NFPA 805 have been assessed for impact on fire protection defense-in-depth and safety margin. Defense-in-depth and safety margins are maintained.

In accordance with the guidance Regulatory Position C.2.2 of Regulatory Guide, the estimated change in risk associated with the HNP transition to NFPA 805 is consistent with the acceptance guidelines of Regulatory Guide 1.174, and therefore, considered acceptable.

4.5.4 Plant Modifications

[To be completed later]

4.6 Monitoring Program

In order to assess the impact of a transition on the current monitoring program, the HNP fire protection program documentation hierarchy, maintenance program process / procedures and plant change processes were reviewed. Sections 4.5.3 and 5.2 of the NEI 04-02 Implementing Guidance were used during the review. The results of those reviews follow.

4.6.1 Compliance with Section 2.6 of NFPA 805

4.6.1.1 Extent of Reliance on Current Programs

[Summarize the extent to which current programs/processes have been relied on.]

4.6.1.2 Overview of Additional Program Elements

The monitoring program has been upgraded in the following ways:

[Describe upgrades. Describe a decision process for determining the appropriate responsibility for monitoring that should be included for fire protection equipment (i.e., does it go in the Maintenance program or the fire protection equipment operability control process).]

4.7 Program Documentation, Configuration Control, and Quality Assurance

4.7.1 Compliance with Documentation Requirements in Section 2.7.1 of NFPA 805

HNP has **[developed/revised]** the Fire Protection Program document that defines the personnel responsible for establishing and implementing the fire protection program and 2) the fire protection policy for the major fire protection program elements (procedures) and 3) the fire protection features (equipment) to which those elements are applied. *[This is the document that contains long-term compliance information for the Fundamental Elements and Minimum design requirements and the process portions (monitoring, change process, evaluation method procedures) of NFPA 805]*

[Summarize this document]

HNP has **[developed/revised]** the Fire Protection Design Basis Document that demonstrates compliance with nuclear safety criteria of NFPA 805. *[This is the document that contains long-term compliance information for the Nuclear Safety Criteria portion of NFPA 805.]*

[Summarize this document]

4.7.2 Compliance with Configuration Control Requirements in Section 2.7.2 of NFPA 805

[Summarize the extent to which current programs/processes have been relied on and any modifications to those processes. The summary may be brief, as shown in the following example. These may include, but are not limited to,

- **Guidance similar to NEI 02-03 for assessing changes**
- **A procedure for the change process if the change does not pass a screening process.]**

4.7.3 Compliance with Quality Assurance Requirements in Section 2.7.2 of NFPA 805

[Summarize the extent to which current programs/processes have been relied on and any modifications to those processes. The summary may be brief, as shown in the following example.]

The existing fire protection quality assurance program is sufficient for a risk-informed, performance-based program transition. The scope of fire protection features that fall under the umbrella of the fire protection quality assurance program may change based upon whether the feature(s) will continue to be credited (directly or via defense in depth analyses) under the new risk-informed, performance-based program.]

5.0 POST-TRANSITION FIRE PROTECTION LICENSING BASIS

5.1 HNP License Amendment Request

The LAR identified all orders, license conditions, Technical Specifications and their bases that required revision or deletion to permit HNP to comply with the new fire protection requirements.

The following orders, license conditions and Technical Specifications were superseded.

[List]

The following orders and license conditions were revised as follows.

[Insert table of original orders and license conditions with revisions side-by-side]

The following Technical Specifications and their bases were revised as follows.

[Insert table of original Technical Specifications and their bases with revisions side-by-side].

5.2 HNP Post-Transition UFSAR

[To be completed later]

Appendix A – NEI 04-02 Table B-1 - Transition of Fundamental FP Program and Design Elements (NFPA 805 Chapter 3)

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.1 General	3.1* General. This chapter contains the fundamental elements of the fire protection program and specifies the minimum design requirements for fire protection systems and features. These fire protection program elements and minimum design requirements shall not be subject to the performance-based methods permitted elsewhere in this standard. Previously approved alternatives from the fundamental protection program attributes of this chapter by the AHJ take precedence over the requirements contained herein.	N/A	N/A - General statement; No technical requirements	HNP-M/BMRK-0011, Code Compliance Evaluation NFPA 805,2003,, Rev. 000,	All
3.2 Fire Protection Plan	N/A	N/A	N/A - General statement; No technical requirements	, , Rev. ,	
3.2.1 Intent	3.2.1 Intent. A site-wide fire protection plan shall be established. This plan shall document management policy and program direction and shall define the responsibilities of those individuals responsible for the plan's implementation. This section establishes the criteria for an integrated combination of components, procedures, and personnel to implement all fire protection program activities	Complies	No Additional Clarification	FPP-001, Fire Protection Program Manual, Rev. 029,	All
3.2.2 Management Policy Direction and Responsibility.	3.2.2* Management Policy Direction and Responsibility. A policy document shall be prepared that defines management authority and responsibilities and establishes the general policy for the site fire protection program.	Complies	No Additional Clarification	FPP-001, Fire Protection Program Manual, Rev. 029,	All
3.2.2.1 [Management Policy on Senior Management]	3.2.2.1* The policy document shall designate the senior management position with immediate authority and responsibility for the fire protection program.	Complies	No Additional Clarification	FPP-001, Fire Protection Program Manual, Rev. 029,	All
3.2.2.2 [Management Policy on Daily Administration]	3.2.2.2* The policy document shall designate a position responsible for the daily administration and coordination of the fire protection program and its implementation.	Complies	No Additional Clarification	FPP-001, Fire Protection Program Manual, Rev. 029,	Section 4.2.6
3.2.2.3 [Management Policy on Interfaces]	3.2.2.3* The policy document shall define the fire protection interfaces with other organizations and assign responsibilities for the coordination of activities. In addition, this policy document shall identify the various plant positions having the authority for implementing the various areas of the fire protection program.	Complies	No Additional Clarification	FPP-001, Fire Protection Program Manual, Rev. 029,	Section 4.2
3.2.2.4 [Management Policy on AHJ]	3.2.2.4* The policy document shall identify the appropriate AHJ for the various areas of the fire protection program.	Further Action Required		FPP-001, Fire Protection Program Manual, Rev. 029,	Section 3.2

Appendix B – NEI 04-02 Table B-2 – Nuclear Safety Capability Assessment - Methodology Review

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.1 Nuclear Safety Capability System and Equipment Selection

A comprehensive list of systems and equipment and their interrelationships to be analyzed for a fire event shall be developed. The equipment list shall contain an inventory of those critical components required to achieve the nuclear safety performance criteria of Section 1.5. Components required to achieve and maintain the nuclear safety functions and components whose fire-induced failure could prevent the operation or result in the maloperation of those components needed to meet the nuclear safety criteria shall be included. Availability and reliability of equipment selected shall be evaluated.

NEI 00-01 Ref	NEI 00-01 Guidance
3 Deterministic Methodology	This section discusses a generic deterministic methodology and criteria that licensees can use to perform a post-fire safe shutdown analysis to address regulatory requirements. The plant-specific analysis approved by NRC is reflected in the plant's licensing basis. The methodology described in this section is also an acceptable method of performing a post-fire safe shutdown analysis. This methodology is indicated in Figure 3-1. Other methods acceptable to NRC may also be used. Regardless of the method selected by an individual licensee, the criteria and assumptions provided in this guidance document may apply. The methodology described in Section 3 is based on a computer database oriented approach, which is utilized by several licensees to model Appendix R data relationships. This guidance document, however, does not require the use of a computer database oriented approach. The requirements of Appendix R Sections III.G.1, III.G.2 and III.G.3 apply to equipment and cables required for achieving and maintaining safe shutdown in any fire area. Although equipment and cables for fire detection and suppression systems, communications systems and 8-hour emergency lighting systems are important features, this guidance document does not address them. Additional information is provided in Appendix B to this document.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with intent	Shearon Harris' safe shutdown methodology was reviewed against the guidelines of NUREG-0800, so references to the requirements of specific sections of Appendix R do not apply. The corresponding sections of NUREG-0800 are C.5.b and C.5.c.			HNP SER initial and Supplement 4, , Rev. ,	

NEI 00-01 Ref	NEI 00-01 Guidance
3.1 [A, Intro] Safe Shutdown Systems and Path Development	This section discusses the identification of systems available and necessary to perform the required safe shutdown functions. It also provides information on the process for combining these systems into safe shutdown paths. Appendix R Section III.G.1.a requires that the capability to achieve and maintain hot shutdown be free of fire damage. It is expected that the term "free of fire damage" will be further clarified in a forthcoming Regulatory Issue Summary. Appendix R Section III.G.1.b requires that repairs to systems and equipment necessary to achieve and maintain cold shutdown be completed within 72 hours. It is the intent of the NRC that requirements related to the use of manual operator actions will be addressed in a forthcoming rulemaking. [Refer to hard copy of NEI 00-01 for Figure 3-1]

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with intent	The corresponding guidelines for Harris are found in NUREG-0800, BTP CMEB 9.5-1 Sections C.5.b(1) and (2).			, , Rev. ,	C.5.b(1) and (2)

Appendix C – NEI 04-02 Table B-3 – Fire Area Transition

Table B-3 Fire Area Transition

Unit	Fire Area Name	Description
1	12-A-BAL	REACTOR AUXILIARY BUILDING UNITS 1 AND 2 BALANCE

Fire Zone	Description
12-A-BAL	REACTOR AUXILIARY BUILDING UNITS 1 AND 2 BALANCE

Regulatory Basis	Phase
NFPA 805, Section 4.2.3.2, 4.2.3.3.a	Post-Transition
NUREG-0800, BTP CMEB 9.5-1, Section C.5.a with deviation	Pre-Transition
NUREG-0800, BTP CMEB 9.5-1, Section C.5.c	Pre-Transition

Performance Goal	Method of Accomplishment	Comments
Decay Heat Removal - CSD	Cool down using RHR Train A (or RHR Train B) from the Control Room.	None
Decay Heat Removal - HSB	Feed the A (or B or C) Steam Generator(s) using the Train A AFW pump (or Train B or turbine-driven AFW pump) from the Control Room.	None
Process Monitoring	Monitor process indication Train A (or B) from the Control Room.	None.
RCS Inventory Control	Maintain inventory using the normal (or alternate) charging path and Charging Pump A (or Train B) from the Control Room and with local manual actions. Maintain RCP seal integrity by thermal barrier cooling.	Actions are considered allowable. See Open Item # 214 concerning actions taken in the event the normal charging flow control valve fails open due to a loss of instrument air. See Open Item # 215 concerning actions to align CSIP minimum flow to the suction of the CSIP vice the VCT.
RCS Pressure Control	Control pressure using train A (or Train B) pressurizer heaters and pressurizer PORVs (or pressurizer and reactor head vent systems) from the Control Room.	Overpressure protection is provided by the pressurizer safety valves (HSB) or RHR suction relief valves (CSD).
Reactivity Control	Trip reactor from the Control Room. Borate from the boric acid tank via the emergency boration flowpath. Use Charging Pump CSIPA (or CSIPB) and charge via hot/cold leg injection lines 1SI-3, 1SI-4, 1SI-52, 1SI-86 or 1SI-107 from the Control Room.	See Open Item #60 on Boric acid pump to CSIP flow path.
Vital Auxiliaries - CCW, ESW, CWS	Operate Train A (or Train B) CCW, ESW and CWS from the Control Room.	None.
Vital Auxiliaries - Electrical	Control Train A and Train B Off Site Power and Emergency Diesel Generators A-SA and B-SB from the Control Room.	None
Vital Auxiliaries - HVAC	Operate HVAC systems from Control Room.	See open item 47 requiring the use of a dedicated HVAC unit to cool the PIC room for a fire in 12-A-BAL.

Reference Document	Document Detail
AOP-036, Safe Shutdown Following a Fire , Rev. 39,	AOP-036.11, Rev. 2
HNP FSSPMD R16 00, Fire Safe Shutdown Program Manager Database, Rev. 016,	12-A-BAL Reports
HNP-E/ELEC-0001, Safe Shutdown in Case of Fire and Fire Hazards Analysis, Rev. 0, 6/2/2006	Attachment 37

Licensing Action	Basis	Date
Deviation from BTP CMEB 9.5-1, Section C.5.a, in that not all penetrations are sealed with equivalently rated fire damper assemblies, door assemblies, or seals.	Deviation was approved based on the conditions on either side of the penetrations, the installed fire protection features, and the physical separation of redundant safe shutdown equipment.	10/1/1986

Appendix D – NEI 04-02 Table F-1 Non-Power Operational Modes Transition

Table F-1 - Non-Power Operational Modes Transition Report

NFPA 805 Section NFPA 805 Section 1.3.1 Nuclear Safety Goal

The nuclear safety goal is to provide reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition

Implementing Guidance 4.3.3 Item 1

Review existing plant outage processes (outage management and outage risk assessments) to determine equipment relied upon to provide Key Safety Functions (KSF) including support functions. Each outage evolution identifies the diverse methods of achieving the KSF. For example to achieve the Decay Heat Removal KSF a plant may credit DHR Train A, DHR Train B, HPI Train A, HPI Train B, and Gravity Feed and Chemical and Volume Control.

Review Test data included in this Review section for illustrative purposes.

Unit Applicability 1

Comments Test data included in this Comments section for illustrative purposes.

Reference Document Document Detail

Implementing Guidance 4.3.3 Item 2

Identify locations where 1) fires may cause damage to the equipment (and cabling) credited above, or 2) recovery actions credited for the KSF are performed (for those KFSs that are achieved solely by recovery action i.e., alignment of gravity feed).

Review Test data included in this Review section for illustrative purposes.

Unit Applicability 1

Comments Test data included in this Comments section for illustrative purposes.

Reference Document Document Detail

Implementing Guidance 4.3.3 Item 3

Identify fire areas where a single fire may damage all the credited paths for a KSF. This may include fire modeling to determine if a postulated fire (MEFS – LFS) would be expected to damage equipment required.

Review Test data included in this Review section for illustrative purposes.

Unit Applicability 1

Comments Test data included in this Comments section for illustrative purposes.

Reference Document Document Detail

Implementing Guidance 4.3.3 Item 4

For those areas consider one or more of the following options to mitigate potential fire damage depending upon the significance of the potential damage:
o Prohibition or limitation of hot work in fire areas during periods of increased vulnerability
o Verification of operable detection and /or suppression in the vulnerable areas.
o Prohibition or limitation of combustible materials in fire areas during periods of increased vulnerability
o Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability
o Use of recovery actions to mitigate potential losses
o Identification and monitoring in/situ ignition sources for "fire precursors" (e.g., equipment temperatures).

Review Test data included in this Review section for illustrative purposes.

Unit Applicability 1

Comments Test data included in this Comments section for illustrative purposes.

Appendix E – NEI 04-02 Table G-1 – Radioactive Release Transition

Table G-1 - Radioactive Release Transition Report

NFPA 805 Section NFPA 805 Section 1.5.2 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.

Implementing Guidance Appendix G Step 1

Review pre-fire plans.
Ensure for locations that have the potential for contamination that specific steps are included for containment and monitoring of potentially contaminated fire suppression water. Update pre-fire plans as necessary.

Review Test data included in this Review section for illustrative purposes.

Unit Applicability 1

Comments Test data included in this Comments section for illustrative purposes.

Reference Document **Document Detail**

Implementing Guidance Appendix G Step 2

Review fire brigade training materials.
Ensure that training materials deal specifically with the containment and monitoring of potentially contaminated fire suppression water. Update training materials as necessary.

Review Test data included in this Review section for illustrative purposes.

Unit Applicability 1

Comments Test data included in this Comments section for illustrative purposes.

Reference Document **Document Detail**

Appendix G – Fire-Induced Multiple Spurious Operations – Resolution Methodology

[The methodology provided in NEI 04-02 as modified by FAQ 07-0038 to address multiple spurious operations (MSOs) will be included in this Appendix]

Appendix H – Operator Manual Actions – Transition to Recovery Actions

The assumptions, criteria, methodology, and overall results of the operator manual action transition to recovery actions are included in Attachment M. (Regulatory Position C.1 and NEI-04-02, Rev. 1, Section 4.6). Operator manual actions and repairs have been transitioned as "recovery actions" in the new NFPA 805 licensing basis. Operator manual actions have been evaluated in accordance with NEI 04-02, Revision 1, for feasibility and reliability. Additional considerations from FAQ 06-0012 **(MLXXXXXX)**, FAQ 06-0011 (MLXXXXXX), and FAQ 07-0030 **(MLXXXXXXX)** were included in assessment transition of operator manual actions.

[Additional detail to be provided later.]

Appendix I – NEI 04-02 Frequently Asked Question – Summary Table

Table [????] – HNP Transition Report – NEI 04-02 FAQs – Status and Reference Table

No.	Rev.	Title	FAQ Ref.	FAQ NRC Comment Ref.	Closure (Prelim.)	Closure (Memo)	In NEI 04-02 Rev. 2?
06-0001	0	Alternate method for Engineering Evaluations	ML061440419	ML062060303	**WITHDRAWN** 12/14/06 ML063480169	**WITHDRAWN** 12/14/06 ML063480169	N/A
06-0002	1c	NEI 04-02 Section 5.3.3 and App. I, Order of Questions for Change Analysis Screening	ML061440420 ML063170357 ML063350515	ML062060303	**CLOSED** 01/04/07 ML070030276	**APPROVED** 01/04/07 ML070030276	Yes
06-0003	1b	Change Analysis Screening	ML061440422 ML063170355	ML062060303	**CLOSED** 01/04/07 ML070030242	**APPROVED** 01/04/07 ML070030242	Yes
06-0004	0	Clarify NFPA 805 Chapter 4 and 3 relationship for 'required' FP systems/features	ML061440430	ML062060303 ML063350442			Yes
06-0005	1	Guidance on FPP-related changes	ML062350095 ML063180544	ML072400021			Yes
06-0006	2	High-low pressure interface definition and NEI 00-01/NFPA 805 discrepancies	ML062350109 ML063170360 ML063540308	ML062890268	**CLOSED** 03/12/07 ML070030117	**APPROVED** 03/12/07 ML070030117	Yes
06-0007	3	NFPA 805 Chapter 3 Requirements for Fire Brigades	ML062350121 ML070030325 ML070510442 ML071550408	ML063170365 ML071380338	**CLOSED** 6/21/07 ML071940375		Yes

Table [????] – HNP Transition Report – NEI 04-02 FAQs – Status and Reference Table							
No.	Rev.	Title	FAQ Ref.	FAQ NRC Comment Ref.	Closure (Prelim.)	Closure (Memo)	In NEI 04-02 Rev. 2?
06-0008	6	Alternate method for Engineering Evaluations	ML062860250 ML070510499 ML070800007 ML071020160 ML071020169 ML071080099 ML071340180	ML063350442 ML071380177 ML071380182 ML072050214 ML072740231			Yes
06-0009		NEI 04-02 Typo Corrections		N/A			Yes
06-0010		Incorporate Regulatory Guide 1.205 Baseline concept into NEI 04-02		N/A			No
06-0011	2	Clarify III.G.3 Compliance Transition	ML062890271 ML070510505 ML072740248	ML072400023			Yes
06-0012	4	Clarify Manual Action Transition in Appendix B	ML062860255 ML063170362 ML070850610 ML071380229 ML071570260	ML063350442 ML071380186	**CLOSED** 6/21/07 ML071940375		Yes
06-0013		Clarify Chapter 4 Methodology Transition Process Bases on Pilot Plant Results			**SUPERSEDED** FAQ 07-0039		N/A
06-0014		Cumulative Risk					No
06-0015		Guidance on not-red determination			**WITHDRAWN** 09/21/07		N/A
06-0016	1	Ignition Source counting guidance for Electrical Cabinets	ML070030348 ML071020174	ML070640555	**CLOSED** 5/17/07 ML071510425		Yes
06-0017	2	Ignition Source counting guidance for High Energy Arcing Faults (HEAF)	ML070030383 ML071350432 ML071570255	ML071730038	**CLOSED** 6/21/07 ML071940375	**CLOSED** 9/26/07 ML072500300	Yes

Table [????] – HNP Transition Report – NEI 04-02 FAQs – Status and Reference Table							
No.	Rev.	Title	FAQ Ref.	FAQ NRC Comment Ref.	Closure (Prelim.)	Closure (Memo)	In NEI 04-02 Rev. 2?
06-0018	1	Ignition Source counting guidance for Main Control Board (MCB)	ML070030427 ML071020181	ML070640562	**CLOSED** 5/17/07 ML071510425	**CLOSED** 9/7/07 ML072500273	Yes
06-0019	3	Define "power block" and "plant"	ML070030437 ML071340184 ML072550063 ML072740255	ML070510365			Yes
06-0020	1	Definition of "applicable"	ML070030443 ML071340188	ML070510369	**CLOSED** 5/17/07 ML071510425		Yes
06-0021	1a	Clarify that air drops are acceptable.	ML070030457 ML071340192	ML070510417	**CLOSED** 5/17/07 ML071510425		Yes
06-0022	1	Identify a list of typical flame propagation tests which are considered acceptable.	ML070030459 ML072340055	ML072740236			Yes
06-0023	0	Grant exception for Diesel Generator Day Tanks located within Diesel Generator Buildings.	ML070030470		**WITHDRAWN** 5/17/07 ML071510425		N/A
06-0024	1	Define what "adequate clearance" is.	ML070030472 ML072340062	ML071380189	**CLOSED** 8/23/07		Yes
06-0025	1b	Define minimum acceptable pre-plan scope.	ML070030476 ML071340194	ML070300588	**CLOSED** 7/19/07 ML072080246		Yes
06-0026	0	Clarify NFPA code requirements for gear maintenance	ML070030480	ML071380194	**WITHDRAWN** 5/17/07 ML071510425		N/A
06-0027	0	Clarify the "where provided" statement.	ML071380236				Yes

Table [????] – HNP Transition Report – NEI 04-02 FAQs – Status and Reference Table							
No.	Rev.	Title	FAQ Ref.	FAQ NRC Comment Ref.	Closure (Prelim.)	Closure (Memo)	In NEI 04-02 Rev. 2?
06-0028	2	Clarify intent of "familiarization with plant fire prevention procedures, fire reporting, and plant emergency alarms" regarding scope of or depth of the training.	ML070030489 ML071340195 ML071550415	ML070510427 ML071380349	**CLOSED** 6/21/07 ML071940375		Yes
06-0029		Clarify zone of influence for NUREG 6850 Task 8.			**WITHDRAWN** 6/21/07 ML071940375		N/A
07-0030		Risk of recovery actions					Yes
07-0031	0	Misc Binning Issues	ML071380238	ML072880327			Yes
07-0032	0	10CFR 50.48(a) and GDC 3 clarification	ML071930378				Yes
07-0033	0	Review of Existing Engineering Equivalency Evaluations	ML071930379	ML072700037			Yes
07-0034		Determination of non-vented Cabinets					Yes
07-0035	0	Bus Duct counting guidance for High Energy Arcing Faults	ML071650151				Yes
07-0036	0	Define compliance categories for Table B-1	ML072320416	ML072700038			Yes
07-0037		Environmental considerations for equipment					N/A
07-0038	0	Lessons learned for MSOs	ML072740262				Yes
07-0039	0	Provide update of NEI 04-02 B-2 and B-3 Processes	ML072740268				Yes
07-0040		Clarification on Non-Power Operations					Yes
07-0041		Chapter 3 Codes and Standards					Yes

Appendix J – Definition of Power Block

For the purposes of establishing the structures included in the HNP fire protection program in accordance with 10 CFR 50.48(c) and NFPA 805, the following plant structures are considered to be part of the 'power block'. The following table provides the clarification that was requested by the NRC as part of FAQ 06-0019, Define Power Block (**(MLXXXXXXXXX)**.

Building	Comments
[LATER]	

FIRE PROTECTION INITIATIVES PROJECT
PROJECT PROCEDURE

FPIP-0126

NON-POWER OPERATIONAL MODES TRANSITION REVIEW

Revision 0

Reichle, Stephen Prepared By 2007.05.07 07:58:12 -04'00'	Began, Keith Reviewed By 2007.05.07 08:02:27 -04'00'	Jeffery Ertman Digitally signed by Jeffery Ertman DN: cn=Jeffery Ertman, c=US, o=Progress Energy, ou=NGG Date: 2007.05.07 08:16:03 -04'00'
Prepared By / Date	Reviewed By / Date	Approved By / Date

NGG Nuclear Generation Group

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this project procedure is to describe the process used to demonstrate that the nuclear safety performance criteria outlined in NFPA 805 are met for high risk evolutions that are performed during non-power operational modes. This procedure does not include development of new, or modification of existing, procedures to be utilized in managing risk post NFPA 805 transition.

This project procedure follows the guidance provided in Section 4.3.3 of NEI 04-02 (Reference 2.6) for performing a transitional review of high risk evolutions that are performed while the plant is in one of the non-power operational modes, and could impact Key Safety Functions.

The Fire Protection Initiatives Project has issued this instruction for the purpose of providing project level guidance during transition of the Progress Energy nuclear plant fleet to NFPA 805. At the completion of the tasks covered by this instruction, it will be cancelled or converted to a NGGC procedure as appropriate.

2.0 REFERENCES

2.1 NGG Fire Protection Program Improvement Initiatives Project Plan

2.2 FPIP-0100, Fire Protection Initiatives Project, Project Controls

2.3 FPIP-0104, Safe Shutdown Equipment List and Fault Tree Logics

2.4 FPIP-0105, Safe Shutdown Circuit Analysis

2.5 National Fire Protection Association (NFPA) Standard 805-2001, Performance Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, Section B.6

2.6 Nuclear Energy Institute (NEI) 04-02, Revision 1, Guidance for Implementing a Risk-Informed, Performance-Based Program Under 10CFR50.48(c)

2.7 NUREG-1449, Final Report, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United Stated, September, 1993

2.8 NUMARC 91-06, Guidelines for Industry Actions to Assess Shutdown Management

2.9 NUMARC 93-01, Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants

2.10 OMP-003, Outage Shutdown Risk Management (Harris plant document)

3.0 DEFINITIONS

3.1 High Risk Evolution

Outage activities, plant configurations or conditions during shutdown where the plant is more susceptible to an event causing the loss of a key safety function. (NUMARC 91-06)

3.2 Key Safety Function

Those functions required to ensure nuclear safety during shutdown consisting of decay heat removal capability (both when the core is in the vessel **AND** in the spent fuel pool), inventory control, power availability, reactivity control, pressure control, and containment. Specifically the Key Safety Functions to be considered are (OMP-003):

Decay Heat Removal

The ability to maintain reactor coolant system (RCS) temperature and pressure, and spent fuel pool (SFP) temperature below specified limits following a shutdown.

Inventory Control

Measures established to ensure that irradiated fuel remains covered with coolant to maintain heat transfer and shielding requirements.

Power Availability

The ability to provide AC or DC power to the components required to provide the Key Safety Functions.

Reactivity Control

Measures established to preclude inadvertent dilutions, criticalities, power excursions or losses of shutdown margin, and to predict and monitor core behavior.

Containment

The action to secure primary (PWR) or secondary (BWR) containment and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions.

3.3 Fire Safe Shutdown Program Manager and Database (FSSPMD)

The FSSPM is a software program and database that has been developed for use in managing the post-fire safe shutdown data and analysis for the Progress Energy nuclear fleet. An independent version of this Program has been developed for each Progress Energy nuclear site. The Program contains data and information on components, circuits, and cables that are credited in effecting a safe shutdown at that plant in the event of a fire. The Program is also used to store data on non-power operations and probabilistic risk assessment components, and has the capability to generate the necessary reports that will document how compliance with NRC regulations is maintained.

3.4 Recovery Action

Activities to achieve the nuclear safety performance criteria that take place outside of the main control room or outside of the primary control station(s) for the equipment being operated, including the replacement or modification of components.

3.5 Risk Management

Integrated process of assessing and reducing the likelihood and/or consequences of an adverse event. (NUMARC 91-06)

3.6 Terms

3.6.1 May

Denotes permission, not a requirement or a recommendation.

3.6.2 Shall

Denotes a requirement or a mandatory activity.

3.6.3 Should

Denotes an expected action unless there is justifiable reason not to perform the action.

4.0 RESPONSIBILITIES

4.1 CES Fire Protection Initiatives Project Manager

4.1.1 Ensuring that work performed under their supervision is performed in accordance with this instruction.

4.1.2 Approval of each plants Transition Report.

4.2 Site Fire Protection Initiative Project Coordinator

4.2.1 Ensuring that Fire Protection Initiative Project tasks and deliverables associated with their plant is performed in accordance with this procedure.

4.2.2 Review and approval of their plant's Transition Report

4.3 Site Safe Shutdown Engineer

4.3.1 Review and approve the list of equipment and circuit analyses required to ensure the ability to achieve Key Safety Functions are not adversely impacted from a fire during non-power operations.

4.4 Safe Shutdown Engineer

4.4.1 Contacting designated individuals within the plant's various departments (Operations, Outage Management, Scheduling, etc.) that are familiar with typical high risk evolutions that are performed during non-power operating modes to identify those systems that need to be considered within the scope of this review.

4.4.2 Identification of equipment required during non-power operations to ensure that Key Safety Functions are maintained.

4.4.3 Preparation of new and modified circuit analyses for equipment identified in 4.4.1.

4.4.4 Performance of a fire area assessment for non-power operations, and preparation of the Transition Report.

4.5 **Fire Protection Engineer**

4.5.1 Provide support to the Safe Shutdown Engineers on an as needed basis to assess situations (scenarios) where fire modeling might prove to be a strategy for demonstrating that fire will not affect a Key Safety Function.

4.5.2 Perform fire modeling for scenarios where a Key Safety Functions may not be affected or lost as a result of a fire in a given area.

5.0 PREREQUISITES

5.1 Personnel assigned to prepare or review documents under this Project procedure shall have the required level of training, completed qualifications for a Post-Fire Safe Shutdown Engineer.

6.0 PRECAUTIONS AND LIMITATIONS

6.1 This procedure does not provide guidance on how to control changes to safe shutdown database (e.g. FSSPMD). Changes to the SSEL and the circuit analysis in the database are to be processed using the guidance provided in References 2.3 and 2.4.

7.0 SPECIAL TOOLS AND EQUIPMENT

N/A

8.0 ACCEPTANCE CRITERIA

8.1 The equipment selected and/or recovery actions identified demonstrate that the nuclear safety performance criteria can be met.

9.0 INSTRUCTIONS

9.1 **Background**

The nuclear safety goal stated in NFPA 805 is:

> "The nuclear safety goal is to provide reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition."

Accomplishment of this goal will be through the management of shutdown and fire risk during high risk evolutions.

The concept of protection of equipment from the effects of fire during plant shutdown conditions is discussed in NUREG-1449. In addition, the current industry approaches for evaluating risk during shutdown conditions involves both quantitative and qualitative assessments and is based on guidance provided in NUMARC 91-06 and 93-01. These guidance documents have been considered in the development of procedures used at

each of Progress Energy nuclear plants to manage risk when the plants are in non-power modes or defueled (i.e. OMP-003 used at HNP).

In order to assess the impact of a fire that might originate when the plant is in a shutdown mode, a nuclear safety assessment similar to that performed for safe shutdown components while the plant is at power shall be performed. This assessment shall be focused on those sets of systems and equipment that are required to ensure that Key Safety Functions (KSF) and safe shutdown conditions can be maintained while various outage related functions are performed. While it is expected that the majority of the equipment required to accomplish these functions would have been identified as required to support safe shutdown, there may be additional sets of systems or differences in the functional requirements and time dependencies on decay heat removal system operation for non-power operation than there was for full power operation.

The guidance provided in this document will be used to identify systems, components, and cables required to ensure that these systems necessary to support each KSF will be available, or compliance strategies for maintaining the KSF are developed.

This process should begin with a discussion of the objectives of this assessment with Probabilistic Risk Assessment (PRA), Fire Protection, Operations, and Outage Management Staffs to obtain their input and determine the best way to integrate the fire protection aspects of this assessment into existing Outage Management Processes.

9.2 Plant Outage Process

During this step a review of existing plant management and risk assessment processes that are utilized during outages will be conducted. The purpose of this review is to identify those systems and equipment that is relied upon to provide Key Safety Functions (KSF) during each outage evolution. Each outage evolution identifies the diverse methods of achieving the KSF. For example to achieve the Decay Heat Removal KSF a plant may credit DHR Train A, DHR Train B, HPI Train A, HPI Train B, and Gravity Feed and Chemical and Volume Control.

During this phase of the review, it will be necessary to identify those high risk evolutions that are typically performed during an outage in order to bound the number of systems that are credited in maintaining each of the Key Safety Functions. It is important to note that there may be new evolutions identified from outage to outage, but it is expected that the core systems credited to maintain the Key Safety Functions will remain the same, and new nuclear safety analysis will not need to be performed.

9.2.1 Identify the plant procedures, or directives, that are utilized to manage risk when the plant is shutdown.

9.2.2 Review these outage management procedures (or directives) and identify the Key Safety Functions that are considered.

9.2.3 Identify the various shutdown and fuel pool cooling evolutions that are performed during an outage, and categorize them as either low or high risk evolutions. (NFPA 805, B.6)

9.2.4 For the high risk evolutions determine the methods (procedures) within these evolutions that are used to achieve the KSF.

9.2.5 Review the procedures utilized to conduct these evolutions to identify the systems and equipment that is credited.

9.3 Identification of Required Equipment

9.3.1 For systems relied upon to achieve, or support, one or more of the outage evolutions, and the Key Safety Functions identified in subsection 9.2, the guidance provided in FPIP-0104 (Reference 2.3) will be utilized in identifying the components required for each of the high risk outage evolutions.

9.3.2 System and plant operating procedures, as well as flow diagrams, and operations training lessons plans should be considered in identification of systems, components, and functions required.

9.3.3 If a component is required to achieve one of the Key Safety Functions, and it is already credited to perform a nuclear safety function (i.e. safe shutdown of plant) when the plant is at power, it should be reviewed to identify any differences in required position and/or function. For example, the existing nuclear safety analysis (Appendix R/NUREG-0800 analysis) may credit the valve in the closed position however; the valve may be required open for shutdown modes of operation.

9.3.4 Components that are required to perform or support an outage function will be identified in the plant's FSSPMD as required for "Non-Power Operation".

9.3.4.1 If the outage related component is not already included in the FSSPMD, a new record shall be added to the SSEL and fields completed as prescribed in FPIP-0104.

9.3.4.2 If the outage related component is already in the FSSPMD as required to support post-fire safe shutdown, and if operating modes are the same as the safe shutdown component, all that is required is to flag the component as required for "Non-Power Operation".

9.3.4.3 If the outage related component is already on the FSSPMD SSEL, but the operating mode for performing the outage evolution is different, a new record shall be created.

9.3.4.4 The key safety function(s) that the component supports will be identified in a separate field. It should be noted that some components such as those for the Emergency Service Water System may support more that one KSF, and each of them should be identified.

9.3.5 Power sources necessary to support the equipment needed for non-power operation modes should also be identified, similar to the method used for power operation in FPIP-0104. These power supplies should also be identified as required for "Non-Power Operations".

9.4 Circuit Analysis

9.4.1 For each new electrically operated component that is added to the SSEL to perform, or support, an outage function a circuit analysis shall be completed and documented in accordance with FPIP-0105 (Reference 2.4). The Circuit

Information Form included in the FSSPMD shall be completed using the input criteria, assumptions, notes, definitions, and standard abbreviations contained in FPIP-0105.

9.4.2 If the component currently has a completed circuit analysis that was performed for a nuclear safety function, but the required position/function of the component to perform its outage function is different that that for safe shutdown, a new circuit analysis utilizing FPIP-0105 shall be performed for the new position since different failures modes will need to be considered.

9.5 Identification of Equipment/Cable or Recovery Action Location

9.5.1 New equipment that is added to the SSEL in the FSSPMD will be identified as to which fire zone it is located when the component is entered into the FSSPMD utilizing Reference 2.3.

9.5.2 Additional cables that are identified for inclusion in the FSSPMD as part of this non-power operations review will be incorporated utilizing the process described in Reference 2.4.

9.5.3 If a recovery (i.e. manual) action is credited to satisfy a KSF (i.e. alignment of gravity feed), the location (fire zone or fire area) of this action shall be identified so that it can be factored into the fire area assessment.

9.6 Fire Area Assessment

9.6.1 Identify those areas ("pinch points") where a single fire might damage (or impede) all credited paths, or affect recovery actions used to perform a KSF. It should be noted that some KSFs may be achieved solely by the performance of some recovery action (i.e. alignment of gravity feed).

9.6.2 Pinch points will be identified using the following process:

9.6.2.1 As previously identified, the FSSPMD will be utilized to store information on components and circuits, as well as their locations within the plant, associated with a specific KSF can not be credited.

9.6.2.2 Reports provided from FSSPMD will identify the components associated with a given KSF in the fire area that may be damaged by a fire and therefore can not be credited.

9.6.2.3 The data outputs will then be reviewed to determine if the minimum requirements (components and systems) are met to ensure that the KSF will remain available.

9.6.3 Fire modeling may be used to determine if the postulated fire would be expected to damage required equipment, or impede recovery actions.

9.6.4 In addition to the review of outage planning and assessment processes, the plant's Technical Specifications and any Administrative control procedures that could affect the availability of equipment required during non-power operational modes should be considered.

9.6.5 Fire protection system operability requirements and transient combustible control programs should be reviewed to identify any practices that are unique to shutdown modes.

9.6.6 For those fire areas where a single fire may damage all credited paths used to perform a KSF, the following options (compliance strategies) should be considered and incorporated into the outage management and planning procedures to reduce the risk from fire depending upon the significance of the potential damage:

- Prohibition or limitation of hot work in fire areas during periods of increased vulnerability.
- Verification of operable detection and /or suppression in the vulnerable areas.
- Prohibition or limitation of combustible materials in fire areas during periods of increased vulnerability.
- Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability.
- Use of recovery actions to mitigate potential losses of key safety functions. This could include staging of backup equipment, repair capabilities, or contingency plans to account for increased vulnerability.
- Identification and monitoring of in-situ ignition sources for "fire precursors" (e.g., equipment temperatures).

9.7 **Documentation**

9.7.1 Additional components selected, and circuit analyses performed, shall be entered into the FSSPMD and changes documented utilizing the Change Control process described in Reference 2.2.

9.7.2 A description of the Non-Power operational modes review and it results shall be incorporated into the plant's Shutdown Calculation. This will be performed by preparing a mark-up of the calculation with necessary attachments for incorporation into the calculation at the next update.

9.7.3 Prepare a Transition Report that summarizes the results of this fire area assessment, and documents the vulnerabilities identified. This report shall also include any recommendation for modifying procedures utilized to manage risk during plant shutdown and outage periods to ensure that Key Safety Functions are not compromised in the event of a fire during high risk evolutions.

9.7.4 Included with the Transition Report should be a summary of the tasks that were performed to demonstrate that the nuclear safety performance criteria are met for high risk evolutions that are performed during non-power operational modes. The accomplishment of these tasks should be documented using the format provided in Table F-1 of Reference 2.6 (see Attachment 1 to this procedure).

10.0 RECORDS

Refer to FPIP-0100 (Reference 2.2) for guidance on electronic storage/filing of project documents.

Table F-1

NFPA 805 – Non-Power Operational Guidance

NFPA 805 Requirements	Implementing Guidance	Process and Results
The nuclear safety goal is to provide reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition.	▪ Review existing plant outage processes (outage management and outage risk assessments) to determine equipment relied upon to provide Key Safety Functions (KSF) including support functions. Each outage evolution identifies the diverse methods of achieving the KSF. For example to achieve the Decay Heat Removal KSF a plant may credit DHR Train A, DHR Train B, HPI Train A, HPI Train B, and Gravity Feed and Chemical and Volume Control.	▪ List the KSFs and the systems / components required to support those function. ▪ Identify those systems / components that require additional analyses. For example, a KSF may rely on instrumentation that is currently not part of the "Safe Shutdown Analysis", or a component may have been modeled in one position (closed, off, etc.) but to support the KSF it would need to be evaluated in an additional positions (open, on, etc.) ▪ For those additional components, perform circuit analysis, location tasks described in Appendix B of NFPA 805. Document the results.
	▪ Identify locations where 1) fires may cause damage to the equipment (and cabling) credited above, or 2) recovery actions credited for the KSF are performed (for those KSFs that are achieved solely by recovery action i.e., alignment of gravity feed).	▪ Evaluate on a fire area basis the loss of KSFs. Document those areas
	▪ *Identify fire areas where a single fire may* damage all the credited paths for a KSF. This may include fire modeling to determine if a postulated fire (MEFS – LFS) would be expected to damage equipment required.	▪ *For the areas identified above, determine if* a single fire in the area can cause a loss of all credited paths for a KSF. ▪ Conservatively, assume the entire contents of a fire area are lost. If this does not result in the loss of all credited paths for a KSF, document success. ▪ If fire modeling is used to limit the damage in a fire area, document that fire modeling is credited and ensure the basis for acceptability of that model (location, type, and quantity of combustible, etc.) is

Table F-1

NFPA 805 – Non-Power Operational Guidance

NFPA 805 Requirements	Implementing Guidance	Process and Results
		documented. These critical design inputs are required to be maintained during outage modes. See next step below.
	▪ For those areas consider one or more of the following options to mitigate potential fire damage depending upon the significance of the potential damage: o Prohibition or limitation of hot work in fire areas during periods of increased vulnerability o Verification of operable detection and /or suppression in the vulnerable areas. o Prohibition or limitation of combustible materials in fire areas during periods of increased vulnerability o Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability o Use of recovery actions to mitigate potential losses o Identification and monitoring insitu ignition sources for "fire precursors" (e.g., equipment temperatures).	▪ Integrate the results of the analysis performed above into the plant's outage management process. ▪ To the extent practical pre-plan the options for achieving the KSF. See list to the left.

(The above Table is from NEI 04-02, Revision 1)

REVISION SUMMARY
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