UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 6, 2009

Chris L. Burton, Vice President
Shearon HNP Nuclear Power Plant
Carolina Power & Light Company
Post Office Box 165, Mail Zone 1
New Hill, North Carolina 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 – REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO ADOPT NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805, "PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION FOR LIGHT WATER REACTOR GENERATING PLANTS" (TAC NO. MD8807)

Dear Mr. Burton:

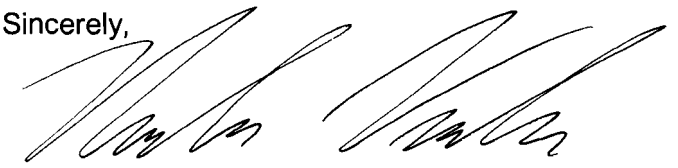
By letter dated May 29, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML081560639), as supplemented by letters dated November 14, 2008, (ADAMS Accession No. ML083240593), and December 11, 2008 (ADAMS Accession No. ML083510191), Carolina Power and Light Company (the licensee), submitted a proposed amendment for the Shearon Harris Nuclear Power Plant, Unit 1.

The proposed amendment would transition the fire protection program to a performance-based, risk-informed one based on the National Fire Protection Association Standard 805 (NFPA 805), "Performance-Based Standard for Fire Protection For Light Water Reactor Generating Plants," 2001 Edition, in accordance with Title 10 of the *Code of Federal Regulations* Section 50.48(c). NFPA 805 allows the use of performance-based methods, such as fire modeling, and risk-informed methods, such as Fire Probabilistic Risk Assessment, to demonstrate compliance with the nuclear safety performance criteria.

The U.S. Nuclear Regulatory Commission (NRC) staff has determined that it needs additional information in order to complete its review. In accordance with previous discussions with the NRC staff, please respond to the majority of the enclosed request for additional information by August 14, 2009, in order to facilitate timely completion of the staff review.

The remaining longer term requests will require responses based on the schedule previously established between the NRC staff and the licensee. Please contact me at 301-415-3178 if you have any questions on this issue, would like to participate in a conference call, or if you require additional time to submit any of your responses.

Sincerely,



Marlayna Vaaler, Project Manager
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Docket No. 50-400

Enclosure: As stated

cc w/enclosure: Distribution via Listserv

UNITED STATES
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REQUEST FOR ADDITIONAL INFORMATION

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

LICENSE AMENDMENT REQUEST TO ADOPT NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805 (NFPA 805), "PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION FOR LIGHT WATER REACTOR GENERATING PLANTS"

DOCKET NO. 50-400

The U.S. Nuclear Regulatory Commission (NRC) staff has determined that it needs responses to requests for information in the following areas in order to continue its review of the subject request for the Shearon Harris Nuclear Power Plant, Unit 1 (HNP or Harris):

1. Programmatic Elements Related to the License Amendment Request (LAR)
2. Fundamental Fire Protection Program and Minimum Design Requirements
3. Meeting the Nuclear Safety Performance Criteria
4. Meeting the Radioactive Release Performance Criteria
5. Risk Assessments and Plant Change Evaluations
6. The NFPA 805 Monitoring Program
7. Program Documentation, Configuration Control and Quality Assurance

1. Please provide the following information relative to LAR programmatic elements:

HNP RAI 1-1

Section 3.1, "Background," of the HNP NFPA 805 Transition Report (Harris Transition Report) does not include any mention of the need to complete the modifications committed to by Carolina Power and Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC or the licensee) as part of its transition to NPFA 805.

Is the completion of any required modifications meant to be included in item "(7) complete implementation of the new licensing basis?" If so, this should be explicitly stated in the discussion since completion of committed modifications is required to complete transition.

The licensee should provide a summary of the proposed modifications, a schedule for implementation of those modifications, and a proposed License Condition reflecting the commitment to, and schedule for, installation of the modifications.

HNP RAI 1-2

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50.48(c)(3)(ii) states:

> The licensee shall complete its implementation of the methodology in Chapter 2 of NFPA 805 (including all required evaluations and analyses) and, upon completion, modify the fire protection plan required by paragraph (a) of this section to reflect the licensee's decision to comply with NFPA 805, before changing its fire protection program or nuclear power plant as permitted by NFPA 805.

Section 4.2.2.3, "Results of the Fire Area-by-Fire Area Review," of the Harris Transition Report includes a bullet for "Open Items." The use of the term "Open Item" implies that further analyses are required. The NRC staff cannot approve a request for transition to a risk-informed, performance-based fire protection program if the analyses required have not been completed.

The licensee should provide a statement under oath and affirmation that all required engineering analyses have been completed and that compliance with the requirements of 10 CFR 50.48(c)(3)(ii) has been achieved.

HNP RAI 1-3

The post-transition use of qualitative performance-based methods (similar to the old Generic Letter (GL) 86-10, "Implementation of Fire Protection Requirements," process) discussed in the Harris Transition Report, Attachment P, "Performance-Based Methods – NFPA 805 Chapter 3 – 10 CFR 50.48.(c)(2)(vii)," is based on the approach documented in NFPA 805 Frequently Asked Question (FAQ) 06-0008, "Fire Protection Engineering Evaluations," Revision 5.

However, agreement was reached and a closure memo was approved based on FAQ 06-0008, Revision 9. To obtain the benefit of the approaches documented in FAQ 06-0008, Revision 9, for post-transition qualitative Fire Protection Engineering Evaluations, the LAR should be revised to reference the appropriate revision of FAQ 06-0008.

HNP RAI 1-4

NFPA 805, Section 3.11.5, "Passive Fire Protection Features – Electrical Raceway Fire Barrier Systems (ERFBS)," states:

> ERFBS required by Chapter 4 shall be capable of resisting the fire effects of the hazards in the area. ERFBS shall be tested in accordance with and shall meet the acceptance criteria of NRC Generic Letter 86-10, Supplement 1, "Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used to Separate Safe Shutdown Trains Within the Same Fire Area."
>
> The ERFBS should adequately address the design requirements and limitations of supports and intervening items and their impact on the fire barrier system rating. The fire barrier system's ability to maintain the required nuclear safety circuits free of fire damage for a specific thermal exposure, barrier design, raceway size and type, cable size, fill, and type shall be demonstrated.

The Harris Transition Report, Section 4.8.2.3, "Hemyc and MT Electrical Raceway Fire Barrier Systems," states that specific testing for the Hemyc and MT fire barrier wraps has been completed. It also states that fire barrier worth has been established for the applications of Hemyc and MT that are credited to meet the Nuclear Safety Performance Criteria at HNP.

However, there is no entry in Attachment A to the Harris Transition Report (Table B-1, "Transition of Fundamental Fire Protection (FP) Program and Design Elements (NFPA 805 Chapter 3)," from the Nuclear Energy Institute (NEI) document NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48(c)") regarding the Hemyc or MT fire barrier wraps.

Please provide a compliance statement with regard to the requirements in NFPA 805, Section 3.11.5. Include in the compliance basis:

- A description of the test protocol
- The acceptance criteria
- Results of the testing with regard to the fire barrier rating
- Any limitations or conditions that need to be applied in crediting the Hemyc and/or MT fire barrier wraps as a method for meeting the Nuclear Safety Performance Criteria

Also, please indicate whether any modifications will be required for the existing fire barrier wraps, whether the existing wraps will be classified as degraded systems until such modifications take place, and describe how configuration control will be maintained in the field.

HNP RAI 1-5

Attachment S, "Plant Modifications," of the Harris Transition Report includes the proposed installation of Incipient Fire Detection Systems to monitor incipient fire conditions in certain critical electrical cabinets in several fire areas as a way to reduce fire risk. FAQ 08-0046, "Incipient Fire Detection Systems," was created to address the use of these systems.

The NRC staff has developed an interim position on this FAQ that provides guidance with respect to how Incipient Fire Detection Systems (also called Very Early Warning Fire Detection Systems (VEWFDS)) may be credited in a Fire Probabilistic Risk Assessment (Fire PRA). In accordance with the NRC staff's interim position, there are numerous conditions that must be met for the staff to accept the full numerical credit provided for the installation of VEWFDS.

Regarding the proposed Incipient Fire Detection Systems to be installed at HNP:

a. When modeling VEWFDS to monitor electrical/electronic cabinets, components that may rapidly degrade, such as electrical/electronic circuit boards that contain electrolytic capacitors, chart recorder drive motors, cooling fan motors, mechanical timers driven by electric motors, etc., should be excluded. Provide a description of the screening process used to inspect cabinets being monitored by the proposed VEWFDS to confirm that components that may degrade rapidly are properly addressed in the model.

b. Based on discussions with the licensee, the proposed VEWFDS at HNP is an aspirated system. For an aspirating system to function properly while monitoring the interior of an electrical/electronic control cabinet, the ventilation characteristics of the cabinet to be monitored must allow for the use of an aspirated VEWFDS (aspirated systems will not function properly in a tightly sealed cabinet). Provide a description of the cabinets to be monitored by the proposed VEWFDS and verify that no cabinets are tightly sealed.

c. FAQ 08-0046 references Electric Power Research Institute (EPRI) document 1016735, "Fire PRA Methods Enhancements: Additions, Clarifications, and Refinements to EPRI 1011989," which includes a discussion on system availability and reliability of VEWFDS. EPRI 1016735 primarily has information on cloud chamber and laser aspirating detection systems. Provide a statement that the system being proposed for HNP is sufficiently similar to those described in EPRI 1016735 that the availability and reliability numbers provided in that document are also applicable for use at Harris.

d. Provide the following information related to the design, installation, and testing of the proposed VEWFDS at HNP:

   1) What is the NFPA code of record (NFPA 76, "Standard for the Fire Protection of Telecommunications Facilities," NFPA 72, "National Fire Alarm Code," or other)?

   2) What training and qualification requirements will the installation technicians have to meet? Will the installation be performed by vendor certified technicians?

   3) What installation testing will be performed and to what standard?

   4) With regard to system sensitivity, how will the initial system Alert and Alarm settings be established? What steps will be taken to avoid spurious/nuisance alarms? After commissioning the VEWFDS, how will system Alert and Alarm setpoint changes be controlled?

   5) What regular and preventive maintenance will be required for the VEWFDS?

   6) How often does the proposed VEWFDS require calibration?

   7) Provide a description of the operator interface with the VEWFDS. How will Alerts and Alarms be annunciated, where will they be annunciated, and who will respond to the Alerts and Alarms?

   8) Describe the configuration controls to be placed on the maintenance, preventive maintenance, and testing procedures for the proposed VEWFDS.

e. Provide a detailed description of the VEWFDS response procedure. What qualifications will be required for the initial responders?

f. Describe the process used to establish the human error probability (HEP) of a successful operator response to a VEWFDS Alert.

g. Provide a description of the process that will be used to assure that VEWFDS Alerts and Alarms are responded to properly. Will the VEWFDS be included in the fire brigade training and drill process?

h. Upon locating the associated cabinet during a VEWFDS Alert, describe the process that will be used to locate the degrading component/sub-component and mitigate the potential fire.

i. Describe the tools and equipment required to locate the source of a VEWFDS Alert. Describe any controls that will be placed on the required tools and equipment.

j. Describe the process that will be used to control the VEWFDS setpoint(s).

k. On what periodicity will the system effectiveness be assessed with respect to the values assumed in the Fire PRA?

l. Describe how the plant monitoring program will maintain the VEWFDS within the Fire PRA-assumed values.

m. Describe the compensatory measures required to be established if the VEWFDS is out of service. How will these compensatory measures be controlled?

HNP RAI 1-6

NEI 04-02, Revision 2, Section B.3.2, "Submittal of Existing Engineering Equivalency Evaluations [EEEEs] in License Amendment Request," states that those EEEEs that demonstrate a fire protection system or feature is adequate for the hazard should be summarized in the LAR documentation. NEI 04-02, Revision 2, is currently undergoing NRC staff review for endorsement in Revision 1 of Regulatory Guide (RG) 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants."

The NRC's current position on this issue is as follows:

- Licensees not requesting specific approval for their adequate for the hazard EEEEs should state that an EEEE has been used to demonstrate compliance, and provide a description of each deviation in the appropriate submittal entries. The staff may then request more detailed information for review during an audit and/or the RAI process.

- Licensees requesting specific NRC approval for their performance-based, adequate for the hazard EEEEs should, in addition, submit a summary for each EEEE that will include sufficient detail to allow for evaluation of the EEEE. At a minimum, this level of detail is expected to include: a) a summary of the deviation; b) a summary of the evaluation of each deviation; and c) a summary of the resolution of each deviation.

- In all cases, licensees that rely on the use of EEEEs for compliance with NFPA 805 requirements should correctly document this usage in their submittal.

In Enclosure 2 of the licensee's November 14, 2008, supplement, HNP requests specific NRC approval for the transition of their performance-based, adequate for the hazard EEEEs, the results of which are contained in Attachment J, "Existing Engineering Equivalency Evaluation Transition," of the Harris Transition Report.

However, in general, there is insufficient detail provided with each evaluation for the NRC staff to correctly assess them. For each EEEE, provide a more detailed summary, including:

- A summary of the condition/deviation

- A summary of the evaluation of each condition/deviation
- A summary of the resolution of each condition/deviation

Conversely, if the licensee wishes to no longer request specific NRC approval to transition the EEEEs, the LAR should be revised accordingly. In either case, HNP should correctly document the usage of EEEEs to establish compliance with the NFPA 805 requirements. This includes providing a description of the evaluated deviation(s) in the appropriate Table B-1, "Transition of Fundamental FP Program and Design Elements," and Table B-3, "Fire Area Transition," entries.

2. Please provide the following information regarding the fundamental fire protection program and the minimum design requirements:

HNP RAI 2-1

Item (3) of NFPA 805, Section 3.2.3, "Fire Protection Plan – Procedures," requires reviews of fire protection program related performance and trends. Please describe how compliance to Section 3.2.3 (3) will be achieved at HNP.

HNP RAI 2-2

NFPA 805, Section 4.1, "Determination of Fire Protection Systems and Features – Methodology," states:

> Once a determination has been made that a fire protection system or feature is required to achieve the performance criteria of Section 1.5, ["Performance Criteria,"] its design and qualification shall meet the applicable requirement of Chapter 3, ["Fundamental Fire Protection Program and Design Elements."]

Section 4.8.1, "Results of the Fire Area-by-Fire Area Review," of the Harris Transition Report includes requirements to answer the questions "Suppression Required? (Yes/No)" and "Detection Required? (Yes/No)" for each fire area, the results of which are captured in Table 4-5, "Fire Area Compliance Summary."

a. When either the "Suppression Required? (Yes/No)" or "Detection Required? (Yes/No)" question is answered "Yes," what requirements apply with respect to the design and qualification of the system(s) in that fire area?

b. What quality requirements apply to a system that has been designated as requiring suppression and/or detection in Attachment C, "NEI 04-02 Table B-3 – Fire Area Transition," of the Harris Transition Report?

c. Section 4.8.1 of the Harris Transition Report includes a bullet under "Suppression Required? (Yes/No)" that states that systems required to meet NFPA 805 Chapter 4, "Determination of Fire Protection Systems and Features," performance-based compliance, including systems credited for defense-in-depth, are summarized in plant change evaluations. This statement implies that systems credited for defense-in-depth in plant change evaluations should be considered as required by NFPA 805 Chapter 4. If a system is required by NFPA 805 Chapter 4, its design and qualification would need to meet the applicable requirement(s) of NFPA 805 Chapter 3. Is this implication

correct? If so, what design, qualification, and quality controls apply to fire detection and suppression systems that are credited for defense-in-depth in plant change evaluations?

HNP RAI 2-3

During the audit of the HNP NFPA 805 transition program, apparent discrepancies were identified between the areas being designated as within the power block per Attachment I, "Definition of Power Block," of the Harris Transition Report, and those contained in HNP site procedure FPP-001. Has FPP-001 been updated to reflect the newer designations cited in Attachment I of the Harris Transition Report? If not, please provide a description of the changes that will be made to address the new areas to be considered within the power block.

HNP RAI 2-4

Some NFPA 805 Chapter 3 elements are complicated or have multiple/varied applications throughout the plant (e.g., Section 3.11.4, "Through Penetration Fire Stops," or Section 3.11.5, "Electrical Raceway Fire Barrier Systems"). This results in some elements requiring more than one compliance strategy entry to fully capture the licensee's compliance basis.

HNP's B-1 Table currently contains only one compliance statement for each NFPA 805 Chapter 3 element or sub-element. Where the licensee relies on more than one compliance strategy for a particular element or sub-element, the B-1 Table must fully capture all of the methods of compliance. Please ensure that where necessary, all of HNP's compliance strategies are captured in the B-1 Table.

In addition, the description of the B-1 Table methodology in Section 4.1, "Fundamental Fire Protection Program Elements and Minimum Design Requirements," of the Harris Transition Report should be updated to reflect any changes required by multiple compliance strategies. Also, please ensure that all aspects of each particular NFPA 805 Chapter 3 element or sub-element are addressed by the appropriate compliance statements.

HNP RAI 2-5

Evaluations of HNP's compliance with several NFPA standards are referenced in a number of B-1 Table elements. A detailed summary of the results of each of these compliance evaluations should be provided in the LAR and appropriately referenced in the B-1 Table. These summaries may be compiled in a separate Attachment to the submittal, at the licensee's discretion.

At a minimum, each summary should include:

1. A description of all evaluated conditions determined to be acceptable based on an engineering, compliance, or other type of evaluation, including:

    - A summary of each condition
    - A summary of the evaluation of each condition
    - A summary of the resolution of each condition

2. A description of all apparent code deviations, including:

- A summary of each deviation
- A summary of the evaluation of each deviation
- A summary of the resolution of each deviation

If the licensee wishes to treat these compliance evaluations in a similar fashion to EEEEs, the information submitted concerning the evaluations should be in alignment with HNP RAI 1-6.

Unless specifically limited by the NFPA 805 Chapter 3 element, compliance evaluations should be completed, at a minimum, for all power block areas. (Note that certain standards, such as NFPA 600, apply plant-wide by nature, and cannot be so limited.)

A partial list of the NFPA standards referenced in the LAR is:

- NFPA 10 Standard for Portable Fire Extinguishers
- NFPA 13 Standard for the Installation of Sprinkler Systems
- NFPA 14 Standard for the Installation of Standpipe and Hose Systems
- NFPA 20 Standard for the Installation of Stationary Pumps for Fire Protection
- NFPA 24 Standard for the Installation of Private Fire Service Mains and Their Appurtenances
- NFPA 30 Flammable and Combustible Liquids Code
- NFPA 37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
- NFPA 51B Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- NFPA 55 Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks
- NFPA 600 Standard on Industrial Fire Brigades
- NFPA 72D&E National Fire Alarm Code & Standard on Automatic Fire Detectors
- NFPA 80 Standard for Fire Doors and Other Opening Protectives
- NFPA 90A Standard for the Installation of Air-Conditioning and Ventilating Systems

HNP RAI 2-6

Where the NRC has specifically not endorsed sections of text in NFPA 805, this text will not be acceptable as part of any licensee's licensing basis. HNP should not reproduce this specifically

not endorsed text in the B-1 Table. Two examples of this from NFPA 805 Chapter 3 are the exception in Section 3.3.5.3, "Prevention – Electrical," and the exception in Section 3.6.4, "Standpipe and Hose Stations." Please ensure that this excluded text does not appear in the B-1 Table of the HNP NFPA 805 LAR.

HNP RAI 2-7

In a number of B-1 Table entries in the Harris Transition Report, the licensee appears to be requesting to use performance based methods as a means of achieving compliance. If this is the case, specific NRC approval under 10 CFR 50.48(c)(2)(vii) or (c)(4) is required to be requested. However, specific approval would require a greater degree of detail and technical justification than is currently provided in the LAR. Under either scenario, the affected B-1 Table entries are not correctly stating compliance, and need to be addressed.

The NRC staff has identified the following B-1 Table entries where this appears to be the case:

- 3.3.1.2.(2), "Control of Combustible Materials," regarding the type(s) of fire-retardant plastic sheeting materials to be used in the power block
- 3.3.1.2.(3), "Control of Combustible Materials," regarding the removal of waste, debris, scrap, packing materials, or other combustibles
- 3.4.4, "Fire-Fighting Equipment"
- 3.7, "Fire Extinguishers"

The licensee should review the B-1 Table to identify any other instances of this condition and re-characterize the compliance statements for all affected entries. If specific NRC approval under 10 CFR 50.48(c)(2)(vii) or (c)(4) is requested, the licensee should provide additional detail and technical justification for each request.

HNP RAI 2-8

In accordance with NEI 04-02, Appendix B.1, "Transition of Fundamental Fire Protection Program and Design Elements," and as described in Section 4.1.1, "Overview of Evaluation Process," of the Harris Transition Report, for NFPA 805 Chapter 3 elements with a "Complies via Previous Approval" compliance strategy, the following details should be provided:

- Appropriate excerpts from licensee or industry submittals regarding the issue for which previous approval is being claimed
- Appropriate excerpts from the NRC documents that provide formal approval of the fire protection system/feature for which compliance via previous approval is being claimed

Appropriate references for both the submittal and approval documents are also required.

During its review of the Harris Transition Report, the NRC staff identified a number of B-1 Table entries where the above requirements were not met. The following matrix details the

inadequacies that were identified during the staff review. The licensee should correct these discrepancies and ensure that there are no others contained in the B-1 Table.

Chapter 3 Element	Identified Issue
3.3.3 Interior Finishes	Provide a correct submittal document reference. Provide a complete submittal document excerpt. Order the excerpts so that the submittal excerpt is followed by the approving document excerpt.
3.3.4 Insulation Materials	Provide a correct submittal document reference. Provide a correct reference for the approving NRC document. Provide submittal and approval document excerpts for each deviating detail. Correctly indicate which sections are quoted text. Order the excerpts so that the submittal excerpt is followed by the approving document excerpt.
3.3.7 Bulk Flammable Gas Storage	Provide a correct submittal document reference. Provide an unedited excerpt (or indicate changes) from the approving NRC document. Provide submittal and approval document excerpts for each deviating detail. Order the excerpts so that the submittal excerpt is followed by the approving document excerpt.
3.3.7.1 Bulk Flammable Gas Location Requirements	Provide submittal and approval document references. Reorder the excerpts so that the submittal excerpt is followed by the approving document excerpt.

Chapter 3 Element	Identified Issue
3.3.12 Reactor Coolant Pumps	Reorder the excerpts so that the submittal excerpt is followed by the approving document excerpt. Provide a reference for ESR 97-00297.
3.5.1 Water Supply Flow Code Requirements	Provide an unedited excerpt (or indicate changes) from the approving NRC document. Provide a proper reference for the NRC Safety Evaluation (SE). Provide an excerpt from the submittal document.
3.5.5 Water Supply Pump Separation Requirements	Provide a submittal document reference. Provide a proper reference for the NRC SE.
3.5.11 Water Supply Yard Main Maintenance Issues	Provide a reference for the submittal document. Provide a correct reference for the approving NRC document. Provide an excerpt from the approving document for each deviating detail. Reorder the excerpts so that the submittal excerpt is followed by the approving document excerpt.
3.5.14 Water Supply Control Valve Supervision	Provide an unedited excerpt (or indicate changes) from the approving NRC document. Provide a submittal document reference. Provide an excerpt from the submittal document.
3.5.15 Water Supply Hydrant Code Requirements	Provide a correct approving document reference. Provide a correct approving document excerpt. Provide a submittal document reference. Provide an excerpt from the submittal document.

Chapter 3 Element	Identified Issue
3.6.1 Standpipe and Hose Station Code Requirements	Provide correct references for the approving documents. Provide a correct reference for the approving document excerpt; this text does not appear in NUREG-1038, "Safety Evaluation Report related to the operation of the Shearon Harris Nuclear Power Plant, Unit No. 1," Supplement 4. Reorder the excerpts so that the submittal excerpt is followed by the approving document excerpt.
3.6.4 Standpipe and Hose Station Earthquake Provisions	Provide correct references for the approving documents. In the second approval document excerpt, clearly indicate which text constitutes the excerpt. Provide a reference for the submittal document (i.e., NLS-86-315).
3.9.4 Fire Suppression System Diesel Pump Sprinkler Protection	Provide an unedited excerpt (or indicate changes) from the approving NRC document. Provide a submittal document reference. Provide an excerpt from the submittal document.
3.9.6 Fire Suppression System Valve Supervision	Provide the correct Amendment number for the Final Safety Analysis Report (FSAR) reference. Provide a submittal document reference. Provide an excerpt from the submittal document.
3.11.3 Fire Barrier Penetrations	Provide correct submittal and approval document references. Provide submittal and approval document excerpts.

HNP RAI 2-9

During its review of the B-1 Table in the Harris Transition Report, the NRC staff identified the following issues that are linked to specific B-1 Table elements. The licensee should review the LAR submittal and ensure that these and any similar conditions are resolved appropriately.

B-1 Table: Element 3.3.1.1 – General Fire Prevention Activities

NFPA 805, Section 3.3.1.1, states: "The fire prevention activities shall include but not be limited to the following program elements..." Please provide a compliance statement that addresses how the "but not be limited to" aspect of the NFPA 805 requirement is incorporated at HNP.

B-1 Table: Element 3.3.1.2 – Control of Combustible Materials

NFPA 805, Section 3.3.1.2, states: "Procedures for the control of general housekeeping practices and the control of transient combustibles shall be developed and implemented. These procedures shall include but not be limited to the following program elements..." Please provide a compliance statement that addresses how the "but not be limited to" aspect of the NFPA 805 requirement is incorporated at HNP.

B-1 Table: Element 3.3.1.2.(5) – Regarding controls on the use and storage of flammable and combustible liquids

NFPA 805, Section 3.3.1.2(5), states: "Controls on use and storage of flammable and combustible liquids shall be in accordance with NFPA 30, "Flammable and Combustible Liquids Code," or other applicable NFPA standards." Please identify in the B-1 Table entry which other NFPA standards were determined to be applicable, and provide references to code compliance calculations for these other applicable standards.

B-1 Table: Element 3.3.1.2.(6) – Regarding controls on the use and storage of flammable gases

NFPA 805, Section 3.3.1.2(6), states: "Controls on use and storage of flammable gases shall be in accordance with applicable NFPA standards." Please identify in the B-1 Table entry which NFPA standards were determined to be applicable, and provide references to code compliance calculations for these applicable standards.

B-1 Table: Element 3.3.1.3.1 – Regarding the development of a hot work safety procedure

NFPA 805, Section 3.3.1.3.1, states: "A hot work safety procedure shall be developed, implemented, and periodically updated as necessary in accordance with NFPA 51B, "Standard for Fire Prevention During Welding, Cutting, and Other Hot Work", and NFPA 241, "Standard for Safeguarding Construction, Alteration, and Demolition Operations." Please provide a compliance statement that addresses HNP compliance with NFPA 241, as required by this section of NFPA 805.

B-1 Table: Element 3.3.8 – Bulk Storage of Flammable and Combustible Liquids

- Please explain the relevance of including a statement regarding HNP's storage of flammable gases in the "Compliance Basis" field of this element, which deals with flammable and combustible liquids.

- Please explain the relevance of the Safety Evaluation Report (SER) open item ("page 266 SER, open item 109") referenced in the "Document Detail" field of this element.

B-1 Table: Element 3.4.1 – On-Site Fire-Fighting Capability

- Please provide point-by-point compliance statements for the subsections of this element.

- Provide a positive statement concerning which NFPA standard(s) HNP follows, given that the "Compliance Basis" field asserts that NFPA 1500, "Standard on Fire Department Occupational Safety and Health Program," and NFPA 1582, "Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians," are "not applicable to HNP as defined within their respective scope statements."

B-1 Table: Element 3.4.2 – Pre-Fire Plans

How do the existing yard pre-fire plan(s) and the new outside yard fire pre-plan developed as a result of radiological release transition activities factor into the list of pre-fire plans described by this element? Please reconcile the apparent disparity in the HNP B-1 Table.

B-1 Table: Element 3.4.2.1 – Pre-Fire Plan Contents

The "Compliance Basis" field for this element only describes what the pre-fire plans should contain. What information do the HNP pre-fire plans actually contain?

B-1 Table: Element 3.4.2.4 – Pre-Fire Plan Coordination Needs

The two paragraphs in the "Compliance Basis" field for this element are unclear and partially redundant. Please clarify this entry in the HNP B-1 Table.

B-1 Table: Element 3.4.3.(a) – Regarding plant industrial fire brigade training

- Section 4.1.1, "Overview of Evaluation Process," of the Harris Transition Report lists only five choices for compliance statements: "Complies", "Complies with Clarification", "Complies Via Previous NRC Approval", " Complies with Use of Existing Engineering Equivalency Evaluations", and "License Amendment Required." The statement in the "Compliance Statement" field of this element, "Complies with NFPA 600," is not one of the available choices. Please provide a correct compliance statement for this element.

- Provide point-by-point compliance statements and appropriate document references for the numbered subsections of this element. Compliance with all points is required.

B-1 Table: Element 3.4.3.(c) – Regarding drills

Please provide point-by-point compliance statements and appropriate document references for the numbered subsections of this element. Compliance with all points is required.

B-1 Table: Element 3.5.2 – Water Supply Tank Code Requirements

- Please ensure that the "Compliance Statement" field for this element is correct (i.e., what is the necessary clarification for the "Complies with Clarification" statement?).

- Please supplement the HNP B-1 Table entry to address the requirement listed in this element for separate and separated suctions for the water supply tanks.

B-1 Table: Element 3.5.8 – Water Supply Pressure Maintenance Limitations

Please explain the relevance of including the Shearon Harris SER in the "Reference Document" field of this element in light of its "Complies" compliance statement. Also, is the page number included in the "Document Detail" field correct given that it is identical to the HNP FSAR document reference? Finally, please attempt to provide a title for NUREG-1083 so that the NRC staff can be assured that it is not being confused with NUREG-1038, "Safety Evaluation Report related to the operation of the Shearon Harris Nuclear Power Plant, Unit No. 1."

B-1 Table: Element 3.5.10 – Water Supply Yard Main Code Requirements

Please ensure that the compliance strategy for this element is correct (i.e., how does the Code Compliance Evaluation for NFPA 24-1977, "Standards for Outside Protection," relate to the "Complies" compliance statement?).

B-1 Table: Element 3.5.13 – Water Supply Header Options

- This element, in part, states that "headers fed from each end shall be permitted inside buildings to supply both sprinkler and standpipe systems, provided steel piping and fittings meeting the requirements of ANSI [American National Standards Institute] B31.1, "Code for Power Piping," are used for the headers (up to and including the first valve) supplying the sprinkler systems where such headers are part of the seismically analyzed hose standpipe system." Please address the seismic portion of this requirement and provide appropriate compliance information.

- Please clarify the relationship of the first paragraph in the "Compliance Basis" field to the remainder of the section.

B-1 Table: Element 3.5.15 – Water Supply Hydrant Code Requirements

This element, in part, states that "a hose house equipped with hose and combination nozzle and other auxiliary equipment specified in NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances," shall be provided at intervals of not more than 1000 feet (305 meters) along the yard main system." Please address the "hose house" requirements and provide appropriate compliance information.

B-1 Table: Element 3.6.2 – Standpipe and Hose Station Capability Limitations

Please ensure that the compliance strategy for this element is correct (i.e., how does the Code Compliance Evaluation for NFPA 14-1976, "Standard for the Installation of Standpipes and Hose Systems," relate to the "Complies" compliance statement?).

B-1 Table: Element 3.6.3 – Standpipe and Hose Station Nozzle Restrictions

- Please explain the "Reference Document" field entry for NFPA 14, or delete if in error.

- Please ensure that the compliance strategy for this element is correct (i.e., how does the Evaluation of NFPA 14 Deviations relate to the "Complies" compliance statement?).

B-1 Table: Element 3.6.4 - Standpipe and Hose Station Earthquake Provisions

The excerpt from the background section of the deviation request included in the "Compliance Basis" field for this element references Section 9.5.15 of NUREG-1038; however, there is no such section contained in NUREG-1038. If this error is included as a part of the original submittal document for the deviation request, please provide an appropriate correction in the HNP B-1 Table entry. If not, correct the "Compliance Basis" entry accordingly.

B-1 Table: Element 3.7 – Fire Extinguishers

Please submit information related to the NFPA 10, "Standard for Portable Fire Extinguishers," code of record compliance evaluation, as described in HNP RAI 2-5, for all power block areas, including a justification for any unevaluated areas.

B-1 Table: Element 3.8.1 – Fire Alarm

- The "Compliance Basis" field for this element states, in part, that "alarm initiating devices credited within [NFPA 805] Chapter 4 to meet the Nuclear Safety Performance Criteria are installed in accordance with..." The requirements of this section are not limited to those devices required by or credited within NFPA 805 Chapter 4. The licensee should ensure that alarm initiating devices are installed in accordance with the appropriate NFPA code of record in all plant areas, and update the "Compliance Basis" field for this element accordingly.

- Please ensure that the compliance strategy for this element is correct (i.e., how do the Code Compliance Evaluations for NFPA 72E, "Standard on Automatic Fire Detectors," and NFPA 72D, "Standard for Proprietary Protective Signaling Systems," relate to the "Complies" compliance statement?).

B-1 Table: Element 3.8.2 - Detection

Ensure the compliance strategy for this element is correct (i.e., how do the Code Compliance Evaluations for NFPA 72E and NFPA 72D relate to the "Complies" compliance statement?).

B-1 Table: Element 3.9.1 – Fire Suppression System Code Requirements

The licensee states in the "Compliance Basis" field for this element that the suppression systems credited to meet the requirements of NFPA 805 Chapter 4 are identified in the individual Fire Safety Analysis calculations (FSAs). However, an NRC staff review of a sample of the FSAs indicates that there is no such differentiation between credited and non-credited suppression systems in the FSAs. HNP should reconcile this apparent discrepancy.

B-1 Table: Element 3.9.4 – Fire Suppression System Diesel Pump Sprinkler Protection

The licensee states in the "Compliance Basis" field for this element that the diesel driven fire pump is located outdoors. However, the provided previous approval excerpt states that the fire

pumps are located in the emergency service water screening structure. In addition, the excerpt does not resolve the topic of this element, which is automatic sprinkler protection for diesel driven fire pumps. HNP should reconcile these apparent discrepancies.

B-1 Table: Element 3.11.1 – Building Separation

The exception to this element states that "where a performance-based analysis determines the adequacy of building separation, the requirements of 3.11.1 shall not apply." Does HNP utilize this exception? If so, please provide a detailed summary of the performance-based analysis.

B-1 Table: Element 3.11.2 – Fire Barriers

- Please ensure that the compliance strategy for this element is correct (i.e., how does the NRC SER contained in NUREG-1038 relate to the "Complies" compliance statement?).

- Please ensure that the section listed for LAP-83-479, "Point by Point Comparison of HNP with NUREG-0800, ["Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants,"]" in the "Document Detail" field is correct.

B-1 Table: Element 3.11.3 – Fire Barrier Penetrations

- What is the relationship between LAP-83-479, "Point by Point Comparison of HNP with NUREG-0800," and NLS-86-137, "Point by Point Comparison of HNP to Requirements of NUREG-0800?" Both are listed in the "Reference Document" field for this element.

- The "Compliance Basis" field is incorrect in stating that conformance with NFPA 101, "Life Safety Code," is not applicable for this element. The NRC did not take exception to the inclusion of this standard into the element when incorporating NFPA 805 into 10 CFR 50.48(c). Therefore, the provisions of NFPA 101 related to this element (i.e., the characteristics of passive fire barrier penetration protective devices [i.e., fire doors and dampers]) do apply. Please provide a compliance statement and strategy that address the requirements of NFPA 101 and correct the HNP B-1 table entry accordingly.

B-1 Table: Element 3.11.4 – Through Penetration Fire Stops

The compliance statement for this element is "Complies via Previous Approval." However, the licensee also states that the characteristics of the actual penetration seal installations (i.e., the combustibility of the seal materials) do not match the previously approved configuration. This situation is not appropriate to the "Complies via Previous Approval" category. Please reconcile the apparent differences between the approved and installed penetration seal configurations and correct the HNP B-1 Table entry accordingly.

B-1 Table: Element 3.11.5 – Electrical Raceway Fire Barrier Systems (ERFBS)

The compliance statement for this element is "Complies with Clarification." However, the licensee is requesting specific approval to include/consider Meggitt Safety Systems Cable as an ERFBS, and references an earlier licensing action on the use of fire resistive cable. Please

ensure that the compliance strategy for the Meggitt cable portion of HNP's compliance with this element is correct and fully captures all aspects of the issue.

HNP RAI 2-10

B-1 Table: Frequently Asked Questions (FAQs)

- The use of, or reference to, FAQs in HNP B-1 Table elements with a "Complies" compliance statement is inappropriate. Elements that rely on or reference FAQs should use a different compliance strategy (e.g., "Complies with Clarification") and explain the relevance of the FAQ to the requirements/guidance in the element's "Compliance Basis" field. The following elements are examples identified during the review: 3.3.1.1.(1), 3.3.1.2.(5), 3.3.1.2.(6), 3.3.1.3.1, 3.3.11, and 3.4.2.1. The licensee should correct these discrepancies and ensure that there are no others contained in the HNP B-1 Table.

- A number of FAQs were withdrawn or changed substantially via the revision process since the HNP B-1 Table was first populated. Please ensure that the B-1 Table references/relies on only the correct/current, NRC accepted, version of any FAQs. Examples of changed or withdrawn FAQs used in the HNP B-1 Table include FAQ 06-0008, "NFPA 805 Fire Protection Engineering Evaluations," and FAQ 06-0025, "Scope and Content of Pre-Fire Plans." The licensee should correct these discrepancies and ensure that there are no others contained in the HNP B-1 Table.

HNP RAI 2-11

B-1 Table: "Document Detail"

The purpose of the "Document Detail" field in the HNP B-1 Table is to help ensure traceability of HNP's licensing basis for each NFPA 805 Chapter 3 element. During its review, the NRC staff identified a number of issues concerning implementation of the "Document Detail" field. The licensee should review the HNP B-1 Table and ensure that these issues are resolved.

Typical problems identified in the "Document Detail" field of the HNP B-1 Table are as follows:

1. Confusing or incomplete document detail entries exist in many HNP B-1 Table elements. It is often unclear which entry from the "Reference Document" field a particular "Document Detail" entry aligns with, and some "Reference Document" entries have no corresponding "Document Detail" entry at all. The following is a list of some of the elements that contain these deficiencies. The licensee should correct these deficiencies and ensure that there are no others contained in the HNP B-1 Table.

• 3.3.1	• 3.3.1.2.(6)	• 3.3.6
• 3.3.1.1.(2)	• 3.3.1.3.1	• 3.3.7.1
• 3.3.1.1.(3)	• 3.3.2	• 3.3.7.2
• 3.3.1.2.(2)	• 3.3.3	• 3.3.7.3
• 3.3.1.2.(3)	• 3.3.4	• 3.3.8
• 3.3.1.2.(4)	• 3.3.5.2	• 3.3.9
• 3.3.1.2.(5)	• 3.3.5.3	• 3.3.10

- 3.3.11
- 3.3.12
- 3.4.1
- 3.4.2
- 3.4.2.1
- 3.4.2.2
- 3.4.2.4
- 3.4.3.(a)
- 3.4.3.(c)
- 3.4.4
- 3.4.5.1
- 3.4.5.2
- 3.4.5.3
- 3.4.6
- 3.5.1
- 3.5.2
- 3.5.3
- 3.5.5
- 3.5.7
- 3.5.8
- 3.5.10
- 3.5.11
- 3.5.14
- 3.5.15
- 3.6.1
- 3.6.2
- 3.6.3
- 3.6.4
- 3.6.5
- 3.8.1
- 3.8.2
- 3.9.1
- 3.9.4
- 3.9.6
- 3.11.1
- 3.11.3
- 3.11.5

Ensure that there is clarity in the "Document Detail" field entries throughout the HNP B-1 Table.

2. "Section 9.5.1" appears in the document detail entries of a number of HNP B-1 Table elements in relation to references from the HNP FSAR and NUREG-1038. This is an insufficient level of detail for the HNP FSAR and NUREG-1038, since Section 9.5.1 represents the entire fire protection program in both these documents. In addition, document detail entries of "all" appear in some cases where a more specific section is called for. These issues might be resolved by including page numbers or specific subsection details in the affected "Document Detail" field entries. The following is a list of some of the elements that contain these deficiencies. The licensee should correct these deficiencies and ensure that there are no others contained in the HNP B-1 Table.

- 3.2.2.1 Management Policy on Senior Management
- 3.3.4 Insulation Materials
- 3.3.5.1 Electrical Wiring Above Suspended Ceiling Limitations
- 3.3.12 Reactor Coolant Pumps
- 3.5.14 Water Supply Control Valve Supervision
- 3.6.1 Standpipe and Hose Station Code Requirements
- 3.6.3 Standpipe and Hose Station Nozzle Restrictions
- 3.6.4 Standpipe and Hose Station Earthquake Provisions
- 3.6.5 Standpipe and Hose Station Seismic Connection Limitations
- 3.9.4 Fire Suppression System Diesel Pump Sprinkler Protection
- 3.9.6 Fire Suppression System Valve Supervision

Ensure that there is specificity in the "Document Detail" field entries throughout the B-1 Table. Please address these additional issues related to "Document Detail" field of the HNP B-1 Table.

- 3.3.2, "Structural:" What does "SER - SSER4" in the "Document Detail" field mean?

- 3.4.3 (a), "Training and Drills," regarding plant industrial fire brigade training: Please explain the relevance of the FAQ 06-0007, "NFPA 805, Section 3.4.1, ["On-Site Fire-Fighting Capability,"] Specific Clarification," reference in the "Document Detail" field.

- 3.5.2, "Water Supply Tank Code Requirements:" Please provide a correct document detail entry for NUREG-1083 and/or the HNP FSAR – page 9-21 is not in Section 9.5.1.

- 3.6.5, "Standpipe and Hose Station Seismic Connection Limitations:" What does "P&L 4.0.24" in the "Document Detail" field mean?

- 3.9.4, "Fire Suppression System Diesel Pump Sprinkler Protection:" Does "9-51" in the "Document Detail" field mean Page 9-51 of NUREG-1038?

HNP RAI 2-12

Harris Transition Report and HNP B-1 Table: Quality Assurance

During its review of the HNP NFPA 805 LAR submittal, the NRC staff identified a number of typographical errors, formatting inconsistencies, and other apparent mistakes in the Harris Transition Report. The licensee should review the Harris Transition Report, correct any identified deficiencies, and ensure that there are no others contained in the submittal. The following are some examples identified by the NRC staff:

1. Harris Transition Report Page 10 – Is the correct previously granted deviation document reference for item (8), regarding the requirements of NFPA 90A for providing fire dampers at exhaust and intakes at external walls, stairs, and roofs, NLS-86-139, as referenced in the text, or NLS-86-137, as referenced in the HNP B-1 Table?

2. Harris Transition Report Page 17 – The bullets under the "License Amendment Required" compliance statement entry are the same as those for the "Complies with Use of Existing Engineering Equivalency Evaluations (EEEEs)" compliance statement entry. Please ensure that the correct bullets are provided for each compliance statement.

3. Duplicate "Reference Document" field entries appear in a number of HNP B-1 Table elements. The following is a list of some of the elements that contain duplicate references. The licensee should correct these discrepancies and ensure that there are no other instances contained in the HNP B-1 Table.

• 3.3.1.2.(6)	• 3.3.12	• 3.6.3
• 3.3.3	• 3.4.1	• 3.6.4
• 3.3.4	• 3.4.4	• 3.6.5
• 3.3.5.1	• 3.5.1	• 3.9.5
• 3.3.5.2	• 3.5.2	• 3.11.1
• 3.3.5.3	• 3.5.5	• 3.11.3
• 3.3.6	• 3.5.8	
• 3.3.7.2	• 3.5.11	

4. Incomplete "Reference Document" field entries for the HNP FSAR appear in a number of HNP B-1 Table elements. The following is a list of some of the elements that contain these incomplete references. The licensee should correct these discrepancies and ensure that there are no other instances contained in the HNP B-1 Table.

• 3.3.1	• 3.3.7	• 3.6.3
• 3.3.1.3.1	• 3.3.7.2	• 3.6.4
• 3.3.2	• 3.3.12	• 3.6.5
• 3.3.3	• 3.4.1	• 3.8.1
• 3.3.4	• 3.4.4	• 3.8.2
• 3.3.5.1	• 3.4.6	• 3.9.4
• 3.3.5.2	• 3.5.2	• 3.9.5
• 3.3.5.3	• 3.6.1	• 3.11.1
• 3.3.6	• 3.6.2	• 3.11.3

5. Additional identified deficiencies related to HNP B-1 Table references are listed in the following matrix. The licensee should correct these discrepancies and ensure that there are no other instances contained in the HNP B-1 Table.

Chapter 3 Element	**Identified Issue**
3.3.1.1.(1) General Fire Prevention Activities	Please provide appropriate revision information for reference documents GNB07H, "HNP Site Specific Orientation," and GNR01N, "Plant Access Requalification."
3.3.1.2.(6) Control of Combustible Materials	Please provide a proper reference for the NFPA 51B, "Standard for Fire Prevention During Welding, Cutting, and Other Hot Work," evaluation if it is indeed the correct reference for this element; otherwise, provide a correct reference for this element.
3.3.7.1 Bulk Flammable Gas Location Requirements	Please provide titles or descriptions for reference documents AR 200493 and AR 206165. Please provide a reference for HNP's compliance with NFPA 55, "Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks."
3.3.8 Bulk Storage of Flammable and Combustible Liquids	Please provide a reference for HNP's compliance with NFPA 37, "Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines." Please provide a correct reference for LAP-83-306.

Chapter 3 Element	Identified Issue
3.3.11 Electrical Equipment	Please provide a correct FAQ reference if FAQ 06-0024, "Adequate Clearance and Energized Electrical Equipment," is to be used to demonstrate compliance for this element.
3.4.2.2 Pre-Fire Plan Updates	Please provide appropriate revision information for reference document FPP-002, "Fire Emergency."
3.4.5.3 Security and Radiation Protection	Please provide appropriate revision information for the "HNP Physical Security and Safeguards Contingency Plan" reference.
3.5.2 Water Supply Tank Code Requirements	Please provide a proper reference for NUREG-1083.
3.5.7 Water Supply Pump Connection Requirements	Please provide titles or descriptions for reference documents 2165-S-0555, Revision 18, 2165-S-0556, Revision 13, and 2165-S-0557, Revision 7.
3.5.8 Water Supply Pressure Maintenance Limitations	Please provide a proper reference for NUREG-1083. Please explain the difference, if any, between the "Shearon Harris SER" and "NUREG-1038."
3.6.2 Standpipe and Hose Station Capability Limitations	Please provide correct NUREG-1038 references.

Chapter 3 Element	Identified Issue
3.6.3 Standpipe and Hose Station Nozzle Restrictions	Please provide correct NUREG-1038 references.
3.6.5 Standpipe and Hose Seismic Connection Limitations	Please provide correct NUREG-1038 references.
3.7 Fire Extinguishers	Please provide appropriate revision information for the Fire Hazards Analysis (FHA) drawings referenced.

HNP RAI 2-13

Section 2.2, "NRC Acceptance of HNP Fire Protection Licensing Basis," of the Harris Transition Report describes the state of NRC acceptance for HNP's current (pre-NFPA 805) fire protection licensing basis. However, the list of deviations previously granted by the NRC is incomplete.

Please provide the NRC disposition of the deviation identified as NLS-86-139, regarding the requirements of NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems," for providing fire dampers at exhaust and intakes at external walls, stairs, and roofs.

HNP RAI 2-14

Section 4.8.2.3, "Hemyc and MT Electrical Raceway Fire Barrier Systems," of the Harris Transition Report describes HNP's use of Hemyc and MT Electrical Raceway Fire Barrier Systems (ERFBS). This section contains a description of HNP's planned resolution for their remaining identified Hemyc/MT issues. As a result of the resolution, some of the installed Hemyc/MT fire barrier systems will no longer be credited to meet the Nuclear Safety Performance Criteria of NFPA 805 Chapter 4, and will subsequently be abandoned in place.

Please describe how HNP will maintain configuration control between those Hemyc/MT installations that will be abandoned in place and those Hemyc/MT installations that will continue to be maintained. Additionally, please ensure that HNP's compliance with respect to the credited Hemyc/MT installations is correctly documented in the HNP B-1 and B-3 Tables, as well as other appropriate locations within the NFPA 805 submittal.

HNP RAI 2-15

Attachment L, "NFPA 805 Chapter 3 Requirements for Approval," of the Harris Transition Report discusses specific deviations from the requirements of NFPA 805, Section 3.5.16, regarding the dedication of the fire protection water supply system, and Section 3.6.5, regarding the cross-connections of the seismic hose stations, for which HNP is seeking approval.

- Please provide a regulatory basis (i.e., 10 CFR 50.48(c)(2)(vii) or 10 CFR 50.48(c)(4)) and an appropriate regulatory justification for each of these deviations.

- In addition, the level of detail and degree of technical justification provided for these two deviations from NFPA 805 is currently insufficient to form the basis for an NRC review and subsequent SE. For each element, HNP should provide a level of detail and degree of technical justification equivalent to that submitted for stand-alone licensing actions.

The NRC staff also has the following specific questions regarding the material presented in Attachment L of the Harris Transition Report:

1. Element 3.5.16 – Do the terms "fire protection water demand" and "fire protection demand" indicate that during certain temporary plant evolutions as approved by the unit SCO, non-fire protection water flows are present from the fire protection system?

2. Element 3.5.16 – Exception No. 1 to this element states that the "fire protection water supply systems shall be permitted to be used to provide backup to nuclear safety systems, provided the fire protection water supply systems are designed and maintained to deliver the combined fire and nuclear safety flow demands for the duration specified by the applicable analysis." The licensee indicated that one aspect of the requested deviation falls within this approved exception (i.e., makeup to the Non-Essential Services Chilled Water Expansion Tank). Please justify the inclusion of this aspect in the request for specific NRC approval given that it falls within the purview of the approved exception.

3. Element 3.6.5 – Please provide a title and detailed summary for calculation SW-0087.

3. Please provide the following information concerning meeting the nuclear safety performance criteria:

HNP RAI 3-1

The discussion of non-power operational (NPO) modes included in Section 4.3, "Non-Power Operational Modes," of the Harris Transition Report states that it is based on NFPA 805 FAQ 07-0040, "Non-Power Operations Clarifications," without citing a revision number.

FAQ 07-0040, Revision 4, has been closed by the NRC staff. However, the information in Section 4.3 of the Harris Transition Report does not appear to be entirely consistent with the closed version of FAQ 07-0040. Please provide justification for any deviations from FAQ 07-0040, Revision 4, that were included in the discussion of NPO modes.

HNP RAI 3-2

Attachment C, "NEI 04-02 Table B-3 – Fire Area Transition," of the Harris Transition Report lists both deterministic (per NFPA 805, Section 4.2.3, "Deterministic Approach") and performance based (per NFPA 805, Section 4.2.4, "Performance-Based Approach") sections of NFPA 805 as the post-transition regulatory basis for numerous fire areas. However, NFPA 805, Section 4.2.2, "Selection of Approach," states that either a deterministic or performance-based approach shall be selected. Therefore, listing both NFPA 805 sections does not meet this requirement. The licensee should correct these discrepancies throughout the HNP B-3 Table.

HNP RAI 3-3

The HNP B-3 Table contains numerous open items that do not provide sufficient detail for the NRC staff to fully understand the issue or deficiency being described. For each Open Item or Variation from Deterministic (VFD) listed in the HNP B-3 Table, please provide the component affected, the potential impact on the ability to meet the nuclear safety performance criteria, and the disposition (modification, performance-based plant change evaluation, alternative risk-informed approach, etc.) of each item. Note that a cross reference to where the required information is available elsewhere in the LAR/Harris Transition Report is acceptable.

HNP RAI 3-4

Pages C-25 and C-26 of the HNP B-3 Table discuss Open Item 128 regarding valve 1AF-55, stating that the resolution of the open item is presented in Attachment 2 to HNP-M/MECH-1124. However, an NRC staff review of HNP-M/MECH-1124 during the onsite regulatory audit at HNP indicates that there is no Attachment 2. Please address or correct this apparent discrepancy.

HNP RAI 3-5

A review of Attachment G, "Operator Manual Actions – Transition to Recovery Actions," of the Harris Transition Report indicates that the 1AF-55 valve has associated defense-in-depth (defense-in-depth) recovery actions. In addition, the "Disposition" column of Table G-2, "Disposition of Pre-Transition Operator Manual Actions," indicates that there is a modification (Engineering Change (EC) 69501) that will make the recovery action for the 1AF-55 valve unnecessary. The modification cited is the installation of an Incipient Fire Detection System.

Please clarify in the HNP B-3 Table if the Incipient Fire Detection System modification is the intended disposition for Open Item 128, or revise the Fire Safety Analysis (FSA) calculation to provide a performance-based change evaluation justifying the as-is condition.

HNP RAI 3-6

In accordance with the method described in NEI 04-02, Appendix B, Section B.2, "Transition of Nuclear Safety Performance Criteria," as endorsed by RG 1.205, the nuclear safety capability assessment should be compared against the methodology provided in NEI 00-01, "Guidance for Post-Fire Safe Shutdown Analysis," Revision 1.

However, in Table B-2, "Nuclear Safety Capability Assessment," of the Harris Transition Report, the Alignment Basis statement for the first entry in the table ("Deterministic Methodology")

references NUREG-0800 and not NEI 00-01. Please describe how the method used to perform the nuclear safety performance analyses for HNP compares to the statement(s) from NEI 00-01.

HNP RAI 3-7

On page B-3 of the HNP B-2 Table (entry "3.1 [Introduction] – Safe Shutdown Systems and Path Development"), the second paragraph of the Alignment Basis statement references Section 4.2.1.2, "Results from Evaluation Process," of the Harris Transition Report.

However, that section of the Harris Transition Report does not discuss cold shutdown. Please provide either a valid reference for where the topic of cold shutdown is addressed in the Harris Transition Report, or provide a discussion of the proposed end state commitment for the NFPA 805 program with respect to the requirement to demonstrate the ability to maintain the fuel in a safe and stable condition.

HNP RAI 3-8

On page B-16 of the HNP B-2 Table (entry "3.1.1.9 – 72 Hour Coping"), the NEI 00-01 guidance deals with the 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," requirement to maintain the ability to repair at least one train of cold shutdown equipment within the 72 hour coping period established by the post-fire safe shutdown (SSD) analysis.

By including this requirement in the HNP B-2 Table without an associated detailed explanation does the licensee plan to carry this analysis requirement forward as-is?

Additionally, under NFPA 805 requirements, does the licensee need to be able to cool the plant down to cold shutdown conditions in order to meet the nuclear safety performance criteria?

Each fire area listed in the Harris Transition Report includes a discussion of the equipment necessary to achieve cold shutdown. Does the inclusion of this equipment and the associated discussion imply that cooldown to cold shutdown is the required end state for these fire areas?

Does HNP have any repairs that are being transitioned to recovery actions in order to be able to achieve cold shutdown? If so, please provide an appropriate discussion within the LAR.

HNP RAI 3-9

On page B-3 of the HNP B-2 Table (entry "3.1 [Introduction] – Safe Shutdown Systems and Path Development"), the Alignment Basis discussion does not provide any information regarding how the requirement for identification of systems available and necessary to perform the required safe shutdown functions is being met by the associated reference(s).

Although several references are provided, there is no discussion of how the process used at HNP compares to the appropriate safe shutdown excerpt from NEI 00-01. Please revise this element of the HNP B-2 Table to incorporate a description of the systems and equipment selection process used at HNP.

HNP RAI 3-10

On page B-6 of the HNP B-2 Table (entry "3.1 [Spurious Operations] – Safe Shutdown Systems and Path Development"), the Alignment Basis statement addresses the three types of associated circuits with the potential for spurious equipment operation and/or loss of power source, as discussed in GL 81-12, "Fire Protection Rule." However, there is no associated discussion on how the high/low pressure interface boundaries are addressed in the HNP SSD analysis. Please discuss whether high/low pressure interface valves were considered in the HNP SSD analysis, and if so, how were they incorporated?

HNP RAI 3-11

Attachment H, "NEI 04-02 Frequently Asked Question – Summary Table," of the Harris Transition Report lists NFPA 805 FAQ 06-0006, "High/Low Pressure Interface Definition and NEI 00-01/NFPA 805 Discrepancies," as one of the FAQs used during the development of the HNP NFPA 805 transition process. However, there was no discussion of FAQ 06-0006 in the HNP B-2 Table. If this FAQ was indeed utilized as guidance during performance of the nuclear safety performance assessment, please provide a discussion explaining how it was applied.

HNP RAI 3-12

On page B-10 of the HNP B-2 Table (entry "3.1.1.3 – Pressurizer Heaters"), the structure of the Alignment Basis statement is focused on crediting pressurizer heaters whenever possible as a means to enhance the operator's ability to ensure that the cooldown rate is controlled. In addition, on page B-21 of the HNP B-2 Table (entry "3.1.2.2 – Pressure Control Systems"), the Alignment Basis statement discusses pressurizer heaters and power operated relief valves (PORVs) as a means to maintain or reduce reactor coolant system (RCS) pressure as necessary during the cooldown process.

However, it is unclear from the HNP nuclear safety capability assessment if there are any fire areas/scenarios where pressurizer heaters are not available to assist during the cooldown process. When pressurizer heaters can potentially be damaged by fire, some licensees include in their post-fire safe shutdown program a requirement that upon loss of pressurizer heaters, the plant will immediately initiate a cooldown in order to maintain a bubble in the pressurizer and thereby preserve RCS subcooling. Another approach licensees may use to control plant pressure in the event that pressurizer heaters are not available is to take the RCS into solid plant operating conditions.

Please provide a discussion on whether or not HNP has fire areas/scenarios where pressurizer heaters are not available to assist during the cooldown process. If so, how do the plant procedures address this issue (for example, do the procedures require the initiation of a cooldown to maintain the pressurizer steam bubble, or direct the operator to establish solid plant operating conditions in order to preserve pressure control)?

HNP RAI 3-13

On page B-20 of the HNP B-2 Table (entry "3.1.2.1 – Reactivity Control"), the Alignment Basis statement implies that the use of borated water is a requirement to ensure an adequate shutdown margin is maintained during plant cooldown. In addition, most 10 CFR Part 50,

Appendix R post-fire safe shutdown analyses for pressurized water reactors (PWRs) include a requirement to control the plant at Hot Standby until sufficient boron is added to the RCS to ensure that the reactor remains subcritical throughout the cooldown process.

Given these factors, is switchover to the refueling water storage tank and the boric acid tank (RWST and BAT) a time critical action, or is switchover only required prior to initiating a plant cooldown? In addition, please provide a discussion of how HNP meets the reactivity control nuclear safety performance criteria prior to switchover to the RWST and BAT.

HNP RAI 3-14

On page B-41 of the HNP B-2 Table (entry "3.2.1.6 – Spurious Components"), the Alignment Basis discussion states that Section 9.1.2.7 of FPIP-0104 directs that for boundaries formed by three normally closed valves or dampers in series, all three should be included in the Safe Shutdown Equipment List (SSEL). Please provide a justification for establishing a limit of three spurious actuations in this situation for inclusion in the nuclear safety performance assessment.

On page B-74 of the HNP B-2 Table (entry "3.5.1.5 – Circuit Failure Risk Assessment Guidance"), the discussion throughout the element uses Regulatory Issue Summary (RIS) 2004-03, "Risk-Informed Approach for Post-Fire Safe-Shutdown Circuit Inspections," as the basis for the safe shutdown analysis regarding multiple spurious operations. RIS 2004-03 was developed to provide risk-informed guidance to NRC inspectors; it was not intended to be used as a justification for design and/or licensing basis decisions, or as a means to assess the risk-significance of circuit failures. Please provide a justification for limiting the consideration of multiple spurious operations in the design and licensing basis to that described in RIS 2004-03.

HNP RAI 3-15

On page B-42 of the HNP B-2 Table (entry "3.2.1.7 – Instrument Tubing"), the NEI 00-01 Guidance section of the element discusses evaluating the effects of fire damage to circuits and equipment in the fire area while taking into consideration the location of instrument tubing that may cause subsequent effects on instrument readings or signals as a result of fire.

With regard to instrumentation tubing:

- In their analyses of potential fire impacts on instrumentation tubing, some licensees have discovered that exposure fires could result in sufficiently elevated temperatures that instrument tubing yield strength values may be exceeded and tubing rupture might become possible. Please describe how instrument tubing integrity is assured at HNP.

- RG 1.205 endorses the deterministic post-fire safe shutdown analysis methodology provided in Chapter 3, "Deterministic Methodology," of NEI 00-01. Section 3.2.1.2 of NEI 00-01 indicates that heat sensitive piping materials, including tubing with brazed or soldered joints, should be evaluated for the effects of exposure fire damage.

  Please provide documentation that demonstrates that heat sensitive piping materials, including tubing with brazed or soldered joints, have been evaluated for the effects of exposure fire damage. Include information that demonstrates that the nuclear safety performance criteria are maintained when fire affects the instrument-sensing lines,

especially any that are constructed of materials having a relatively low melting point (such as copper) and those that include brazed or copper fittings.

HNP RAI 3-16

On page B-69 of the HNP B-2 Table (entry "3.5.1.1 – Circuit Failure Types and Impact"), the Alignment Basis statement discusses a previously evaluated deviation from the traditional safe shutdown analysis assumption that cable-to-cable interactions must be assumed to occur.

However, based on industry and NRC sponsored fire testing of cables, this deviation can no longer be supported (operating experience and fire testing have made the deviation invalid). Please provide a justification for maintaining this SSD analysis deviation in the HNP B-2 Table.

HNP RAI 3-17

On page B-77 of the HNP B-2 Table (entry "3.5.2.1 – Circuit Failures Due to an Open Circuit"), the NEI 00-01 Guidance section of the element discusses the potential for secondary damage created by an open circuit associated with a high voltage current transformer (CT) circuit.

An open circuit associated with a loaded CT can result in catastrophic failure of the CT, possibly resulting in a fire at another location (e.g., fire damage on a cable that runs from a switchgear room to the control room could result in failure of the CT, located at the switchgear, causing an additional fire at the switchgear).

The Alignment Basis statement for this element does not address how high voltage circuits with CTs were treated in the nuclear safety capability assessment. Please provide additional information regarding how high voltage CTs were addressed in the HNP SSD analysis.

HNP RAI 3-18

On page B-86 of the HNP B-2 Table (entry "3.5.2.4 – Circuit Failures Due to Inadequate Circuit Coordination"), the NEI 00-01 Guidance section of the element discusses circuit failures due to inadequate circuit coordination between the supply breaker/fuse and the load breakers/fuses for power sources that are required for safe shutdown.

An additional concern with respect to fire propagation among associated circuits of a common power source is fire-induced damage to direct current (DC) control power, resulting in the inability to trip fire damaged circuits (see Daily Event Report No. 44351, dated July 16, 2008, from the Point Beach Nuclear Station).

To address this, the common enclosure analysis should include a review of potential fire damage to DC control power circuits associated with electrical switchgear, which may result in a fire-induced loss of tripping capability to one or more circuit breakers within the switchgear. This is relevant as a loss of tripping capability combined with a fire-induced short to ground on the load cable could result in fire propagation through the common enclosure.

Please describe how the HNP common enclosure analysis addressed the issue of fire-induced damage to DC control power.

HNP RAI 3-19

On page B-86 of the HNP B-2 Table (entry "3.5.2.4 – Circuit Failures Due to Inadequate Circuit Coordination"), the Alignment Basis discussion states that "associated circuits by common power supply were identified and dispositioned during the cable selection and circuit analysis process. Where a lack of coordination created a compliance issue, the cables were dispositioned in a manner similar to other cables in the area under analysis that could adversely affect safe shutdown." Please provide a list of associated circuits where a lack of coordination created a compliance issue and provide the associated disposition for each.

HNP RAI 3-20

Several fire areas in the HNP B-3 Table identify the Method of Accomplishment for the RCS inventory control Performance Goal as maintaining the normal charging (or alternate charging) flowpath, and/or maintaining reactor coolant pump (RCP) seal integrity via seal injection.

The volume control tank (VCT) is the normal water supply to the charging pumps, and has a limited capacity without makeup. Without instrument air to throttle flow, it would be quickly depleted, potentially leading to damage of the running charging pumps. Spurious VCT isolation (e.g., from fire induced damage) would similarly damage running pumps.

It is apparent that the licensee is taking credit for new plant equipment (i.e., alternate seal injection) as a means of maintaining RCS inventory control; however, the associated information is not contained within the LAR. The licensee should clarify how the RCS inventory control, boration, and RCP seal integrity functions are being achieved for each fire area, how the availability of at least one charging pump is being assured given the potential for pump damage due to fire, and for which fire areas the new plant equipment is now being credited.

HNP RAI 3-21

In reviewing several calculations for individual fire areas during the onsite regulatory audit at HNP (specifically, calculations HNP-M/MECH-1105 to 1127, 1179, and 1191), it was noted that some unprotected cables are dispositioned as "not within the zone of influence of a risk-significant fixed ignition source." Area diagrams are also provided which physically demonstrate the location of these unprotected cables.

However, there is not a one-to-one correspondence between the unprotected cables identified within the calculations and those identified in the associated area diagrams. Please provide a discussion of where the physical routing of unprotected cables in relation to fixed ignition sources, and the determination of the risk significance of those sources, is documented, especially if it is not entirely within these calculations and figures.

HNP RAI 3-22

In its review of the individual fire area calculations contained in the HNP B-3 Table during the onsite regulatory audit at HNP, the NRC staff noted numerous open items: 1) identified without any specific resolution; 2) with a proposed (as opposed to already initiated) tracking EC; 3) with unclear statements regarding what a specific EC "should" accomplish (see Open Item 148); or 4) that include a statement that one or more ECs are "evaluating options" (see Open Item 18).

In addition, the NRC staff noted that several open items refer to "Attachment 2" of an associated calculation (as identified in the "Disposition" field) for disposition via a change evaluation, but the referenced attachment does not clearly identify or provide a relevant evaluation that is associated with the open item. Other open items have no EC or reference to a change evaluation, but include only a reference to an associated action request (AR).

The licensee should provide a single complete list identifying all remaining open items and their proposed resolution for NRC staff review. For open items that will not be completed by the time the HNP NFPA 805 LAR is approved, the licensee should propose a license condition in order to assure completion of the specific committed actions that ensure compliance with NFPA 805.

HNP RAI 3-23

The NRC staff review of the calculations provided by the licensee during the onsite regulatory audit at HNP has identified specific issues which the licensee should disposition:

a. Table A2-3, "MT ERFBS – Fire Area 1-A-BAL-C," of calculation HNP-M/MECH-1105, Revision 1, identifies two cables as not meeting the NFPA 805 deterministic separation requirements: Cable 0333A and Cable 0310A.

   Damage to Cable 0333A results in a loss of residual heat removal heat exchanger bypass flow; however, this would not appear to directly cause a loss of shutdown cooling capability, but only a loss of normal RCS cooldown control capability.

   Damage to Cable 0310A results in a loss of flow indication for the normal charging flowpath; however, per Attachment 1, "Fire Area 1-A-BAL-C – B-3 Table – Nuclear Safety Capability Assessment Summary," of HNP-M/MECH-1105, RCS inventory is controlled by the safety injection flowpath (valve 1SI-4), so it is unclear to the NRC staff why Cable 0310A is required for this area.

   Table A2-1, "Defense-in-Depth Impact Review," of calculation HNP-M/MECH-1105 presents the results of the fire risk analysis as less than 1.0E-7 (the threshold that requires NRC notification per the Fire Protection standard licensing condition), and therefore acceptable. However, there is no discussion of how the cause/effect relationship is actually modeled in the PRA for these two cables (i.e., what is assumed to be failed given a fire of sufficient intensity to damage these cables).

   Please provide a discussion to address the apparent issues outlined above.

b. Cable 0245D and Cable 0268C are identified in Figure A2-1, "Fire Area 1-A-BAL-C – Main Fire Scenarios," of calculation HNP-M/MECH-1105, Revision 1, as subjects of change evaluations. However, there is no disposition of these cables in Table A2-2, "Cables without ERFBS – Fire Area 1-A-BAL-C," or Table A2-3, "MT ERFBS – Fire Area 1-A-BAL-C." Table A2-2 does include additional cables not shown on Figure A2-1 for containment sump valves 1CT-102 and 1CT-71, which appear to be associated with Open Item 92; however, similar cable discussions for other open items (for example, Open Item 95 for valve 1SI-3, Open Item 96 for other containment sump valves, and Open Item 97 for valve 1SI-86) are not in the table.

It is not clear to the staff what method is being used by the licensee to compile and present a complete list of noncompliance items for review and approval by the NRC. Accordingly, the licensee should specifically address the above discrepancies in calculation HNP-M/MECH-1105.

Further, if the above are indeed improper omissions of noncompliant items which require evaluation, then an extent of condition determination should be made and the results, along with any revised risk analyses, should also be provided.

c. Attachment 1, "Fire Area 1-A-BAL-E – B-3 Table – Nuclear Safety Capability Assessment Summary," of calculation HNP-M/MECH-1107, Revision 1, identifies that the Method of Accomplishment for RCS inventory control is via the safety injection flowpath (injection line 1SI-3 or 1SI-4).

Open Item 170, which is applicable to this element, states that isolation of the VCT and alignment to the RWST is an action only required after boration for cold shutdown. However, if the emergency core cooling system (ECCS) flowrate through 1SI-3 or 1SI-4 is greater than the emergency boration and normal VCT makeup flowrates, it is plausible that the VCT could be rapidly emptied, and the charging pump suction starved unless the RWST supply valves were available and opened during hot standby.

Please provide a description of how the safety injection flowpath is successfully operated during hot standby conditions without the use of the RWST supply to the charging pump suction, as is implied by this open item.

d. Attachment 1, "Fire Area 1-A-BAL-J – B-3 Table – Nuclear Safety Capability Assessment Summary," of calculation HNP-M/MECH-1109, Revision 1, identifies one of the Methods of Accomplishment for RCS inventory control and reactivity control as emergency boration via the RCP seal injection flowpath.

Please provide an analysis, as available, demonstrating that adequate charging flow and boron concentration reach the reactor via this flowpath to support hot standby and cooldown to cold shutdown. If such an analysis is not available, the licensee should describe its basis for asserting that this flowpath is a success path for reaching a safe shutdown condition. Please note that this issue also applies to fire areas described in other calculations and should be addressed as appropriate.

e. Attachment 1, "Fire Area 1-G – B-3 Table – Nuclear Safety Capability Assessment Summary," of calculation HNP-M/MECH-1115, Revision 1, identifies the Method of Accomplishment for RCS inventory control as via the safety injection line, but for reactivity control as via the normal or alternate charging line. Please explain why two separate injection paths are being provided when only one should be needed, and describe the basis for HNP selecting this shutdown strategy.

f. Attachment 1, "Fire Area 1-A-BAL-A – B-3 Table – Nuclear Safety Capability Assessment Summary," of calculation HNP-M/MECH-1116, Revision 1, regarding Fire Area 1-A-BAL-A4, states that RCP seal integrity may be lost due to simultaneous loss of seal injection and seal cooling. Revision 0 of this calculation states that such a condition

would not result in a catastrophic RCP seal failure and referred to exception EMERGENT-2007-005, but no further basis for disposition of this item was identified.

Open Item 348 is included in Revision 1 to calculation HNP-M/MECH-1116, and continues to refer to exception EMERGENT-2007-005, but provides no further information regarding this issue. The disposition of the open item refers to Attachment 2 of HNP-M/MECH-1116. However, a review of Attachment 2 reveals that Cable 0970E, which could cause a loss of thermal barrier cooling if it were to fail during a fire, was added since Revision 0 to Table A2-3, "Cables without ERFBS – Fire Area 1-A-BAL-A," but no discussion of the zone of influence (ZOI) summary results is provided.

No other table entries in Attachment 2 (i.e., Table A2-3, Table A2-4, "MT ERFBS – Fire Area 1-A-BAL-A," or Table A2-5, "HEMYC ERFBS – Fire Area 1-A-BAL-A") appear to address the potential loss of RCP seal integrity. In addition, a review of the area diagram for this fire area does not identify any RCP seal integrity related items.

The licensee should identify where the disposition of this open item and the surrounding issue of RCP seal integrity is found within the documentation, and/or provide a detailed summary of the disposition of this item/issue in order to support the NFPA 805 transition.

g. Open Item 70 in calculation HNP-M/MECH-1117, Revision 1, states that hot standby manual actions to preserve RWST inventory are considered acceptable based on time being available to complete the actions prior to depletion of the RWST inventory below what is required to support shutdown to cold shutdown conditions.

However, the NRC staff notes that the potential for spurious actuation of containment sprays, which can rapidly deplete RWST inventory, should be evaluated in the fire analysis as it may negatively impact this item/issue. The licensee should 1) clarify whether this issue is currently evaluated in the associated HNP fire analysis, and 2) describe how HNP assures that containment spray operation cannot inadvertently occur and lead to a loss of required RWST inventory.

h. Open Item 191 in Attachment 1, "Fire Area 1-A-CSRA – B-3 Table – Nuclear Safety Capability Assessment Summary," of calculation HNP-M/MECH-1119, Revision 1, identifies that spurious closure of valve 1CS-165 may require the use of the 'C' centrifugal safety injection pump (noted as CSIPC).

However, within the RCS inventory control Performance Goal section of this element, spurious closure of valve 1CS-165 refers only to Open Item 28 and Open Item 187, while Open Item 191 simply appears without a reference later in the element.

In addition, Open Item 191 provides various internal references to exceptions as part of the disposition for this item (i.e., ENG_REVIEW-103, EMERGENT-2007-05a, and ESFAS-CI-CSRA), as well as a reference to the change evaluations in Attachment 2, "Fire Area 1-A-CSRA – Scenario Discussions – Transition Change Evaluations," of HNP-M/MECH-1119, but does not provide a description or summary to clarify how these exceptions/evaluations address the associated issue. Please provide a discussion to address and/or disposition the apparent issues/items outlined above.

i. Table 3-3, "Defense-in-Depth Recovery Actions," of calculation HNP-M/MECH-1122, Revision 1, identifies that an action is required for Component EFSAS-SI to assure adequate defense-in-depth for the performance-based evaluation of this fire area.

No specific recovery action is identified in Table 3-3, but it is stated that train 'A' reset is unavailable, and that specific equipment cannot be secured as it is inaccessible due to the location of the fire. Please clarify what is entailed in the associated action, and better describe this action in the appropriate documentation.

In addition, the NRC staff noted that there are similar "non-actions" contained elsewhere in the supporting calculations for other fire areas. For example, HNP-M/MECH-1123, Revision 1, includes in its Table 3-3 a requirement for an action associated with spurious closure of valve 1CS-166, but no action is specified. The licensee should evaluate the extent of condition of similar defense-in-depth "non-actions" in the supporting calculations for other fire areas, and ensure that each action is clearly specified.

j. Table A2-3, "Cables without ERFBS – Fire Area 1-A-SWGRB," of calculation HNP-M/MECH-1123, Revision 1, identifies numerous cases where a failure impact exists that could cause a performance goal of the element to not be met, as well as indicating that there are risk-significant fire scenarios which would cause the failure.

The risk impact of these failures is not insignificant, and is not screened within the calculation. However, no defense-in-depth actions are identified regarding appropriate compensation for the loss of a performance goal in a higher risk scenario.

The specific affected cables are identified as Cable 0273C, Cable 0273D, Cable 0417E, and Cable 0419C. The licensee should further evaluate and describe how defense-in-depth is achieved and acceptable for these scenarios (i.e., identify the alternate strategies assumed in the risk analyses to achieve safe shutdown), and/or provide a description of appropriate actions.

k. Open Item 128 in calculation HNP-M/MECH-1124, Revision 1, refers to Attachment 2, "Design Review Records," of this calculation for disposition, but Attachment 2 is simply the engineering review records for the calculation. Please provide an appropriate justification for disposition of the open item and update its associated documentation to adequately reflect the licensing basis.

l. Attachment 1, "Fire Area 12-A-CRC1 – B-3 Table – Nuclear Safety Capability Assessment Summary," of calculation HNP-M/MECH-1126, Revision 1, identifies that the Performance Goal for RCS inventory control is met, in part, by thermal barrier cooling of the RCP seals in order to maintain seal integrity, and refers to Open Item 101.

Open Item 101 states that the previously approved manual actions to de-energize the operator and re-open the motor-operated valves required to establish thermal barrier cooling will be changed to not require re-opening of the valves. It is also stated that the actions are allowable under the current licensing basis (CLB) and are therefore not subject to a change evaluation. Finally, the open item states that the likelihood and consequences of a RCP seal loss of coolant accident (LOCA) will be evaluated in the Fire PRA and considered in the change evaluation for this area. The disposition of this

item refers to Attachment 2, "Record of Lead Review," of HNP-M/MECH-1126, which is simply the engineering review record for the calculation.

Given the above information, the NRC staff is unclear as to how this item is being addressed for compliance with NFPA 805. In addition, it is the staff's conclusion that the currently credited manual actions to assure the valves associated with RCP seal cooling remain open and unaffected by a fire are recovery actions, and that if the scope of the action is revised as proposed, then the previous approval is no longer applicable. In this situation, a risk assessment would be required to justify the use of performance-based compliance with NFPA 805 for these recovery actions. Accordingly, the licensee should revise its calculation and submit the appropriate information for staff review.

m. Open Item 346 in calculation HNP-M/MECH-1126, Revision 1, refers to a change evaluation and Attachment 2, "Record of Lead Review," of this calculation for disposition, but Attachment 2 is simply an engineering review record for the calculation. Please provide an appropriate justification for disposition of the open item and update its associated documentation to adequately reflect the licensing basis.

n. In calculation HNP-M/MECH-1127, Revision 1, the delta-risk calculation results are presented in Table A2-1, "Fire Scenario Results [Core Damage Frequency] (CDF)," and Table A2-2, "Fire Scenario Results [Large Early Release Frequency] (LERF)," as zeros.

However, the licensee has stated that no delta-risk evaluations were performed for alternate shutdown because it is consistent with the CLB. Therefore, the tables included in this calculation are misleading as they imply such delta-risk evaluations have been performed and are of very low risk (zero). The licensee should revise this and other similar calculations (if they exist) to clearly state how the delta-risks are developed (i.e., by actual calculation, screening, or by assuming no change in risk).

HNP RAI 3-24

From the LAR, it appears the licensee is proposing to credit swing charging pumps, new alternate seal injection equipment, and other plant systems, structures and components (SSCs) not currently addressed in HNP's Technical Specifications (TS) as means of demonstrating compliance with NFPA 805, and/or as part of the overall transition process.

Please provide a comprehensive list of safe shutdown SSCs not currently addressed by an existing TS Limiting Conditions for Operation (LCO), and either propose a new TS LCO for each item or provide an acceptable alternative administrative control to assure availability of this equipment, including appropriate compensatory measures when the SSC is unavailable. The licensee should also demonstrate that the requirements of 10 CFR 50.36(d)(2)(ii)(D) are satisfied for each SSC not proposed to be addressed by a TS LCO.

HNP RAI 3-25

On page C-3 of the HNP B-3 Table (Fire Area 12-A-BAL – Reactor Auxiliary Building Units 1 and 2 Balance), Engineering Evaluation ESR 01-00144, "Fire Door Warping," relies on the fact that the subject stairwell(s) do not require a fire resistance rating. Are these stairwells used for egress to accomplish any NFPA 805 related recovery actions? If yes, please provide a

technical justification to demonstrate that a warped fire door will not impact the ability of the operator(s) to complete the required action(s).

HNP RAI 3-26

On page C-4 of the HNP B-3 Table (Fire Area 12-A-BAL – Reactor Auxiliary Building Units 1 and 2 Balance), suppression is not credited for Fire Area 12-A-BAL. This appears to be inconsistent with the subsequent statement that detection is required for defense-in-depth in the area of the MT wrap at the 286 foot elevation in Fire Zone 12-A-5-DIH. Would not the same statement be true regarding the use of suppression in this area? Please provide a justification for not requiring suppression, in addition to detection, for defense-in-depth in this fire area.

HNP RAI 3-27

On page C-4 of the HNP B-3 Table (Fire Area 12-A-BAL – Reactor Auxiliary Building Units 1 and 2 Balance), the disposition of Open Item 82 indicates that modification EC 67743 will de-energize several breakers as a normal plant configuration in order to prevent spurious operation of valves that could result in the addition of reactor makeup water to the charging path, thereby diluting the boron concentration required for safe shutdown, as well as valves with the potential to inject nitrogen into the RCS via the seal injection path.

Would implementation of this modification mean that these valves could not be operated while the plant is in the normal power operating condition? If not, please describe the administrative controls that would be used when these valves are required to be energized during power operation to permit system functions, and how these controls continue to assure that the plant can be safely shutdown during such conditions.

HNP RAI 3-28

On page C-8 of the HNP B-3 Table (Fire Area 12-A-CR – Control Room, Reactor Auxiliary Building), two of the modifications (EC 54065 and EC 67772) cited as a means of correcting spurious actuation concerns for the control room utilize the installation of Meggitt fire rated cable. Elsewhere, the Harris Transition Report states that all cables that enter the control room terminate there (i.e., there are no cables that are routed through the control room that do not terminate within it). However, operating experience and ongoing analyses demonstrate that Meggitt cable is still vulnerable to spurious actuations at the termination points. Given this concern, please describe how the installation of Meggitt cable will aid in preventing spurious actuations within the Main Control Room.

HNP RAI 3-29

On page C-8 of the HNP B-3 Table (Fire Area 12-A-CR – Control Room, Reactor Auxiliary Building), Open Item 53 involves spurious opening of the steam generator (SG) PORVs. The associated change evaluation references HNP-M/MECH-1127; however, SG PORVs are not discussed in the latest version (Revision 1) of HNP-M/MECH-1127.

Please explain where this open item has been addressed. One of the modifications (EC 62343) in Attachment S, "Plant Modifications," of the Harris Transition Report addresses spurious

actuation of PORV 1MS-62 in the 12-A-CR and 12-A-CRC1 fire areas. Should the HNP B-3 Table entry for fire area 12-A-CR reference this modification for Open Item 53 as well?

HNP RAI 3-30

On page C-9 of the HNP B-3 Table (Fire Area 12-A-CR – Control Room, Reactor Auxiliary Building), Open Item 54 references one modification (EC 68656) and two engineering change requests (ECR 5645 and ECR 5646) to address an unisolated control cable for valve 1AV-AH6B and the spurious operation of valves 1SW-1171 and 1SW-1204.

However, per the description in Attachment S of the Harris Transition Report, EC 68656 appears to only address the spurious actuation of valve 1SW-1204. Please provide assurance that the spurious actuation of valves 1AV-AH6B and 1SW-1171 is addressed appropriately in ECR 5645 and/or ECR 5646, or provide an alternative description to resolve this issue.

HNP RAI 3-31

Pages C-6 to C-9 of the HNP B-3 Table (Fire Area 12-A-CR – Control Room, Reactor Auxiliary Building), the FSA for the control room, HNP-M/MECH-1127, Revision 1, and pages G-12 to G-14 of Attachment G, "Operator Manual Actions – Transition to Recovery Actions," to the Harris Transition Report, continue to credit a 10 minute window for completion of control transfer from the control room to the auxiliary control panel (ACP) in the event of a control room fire.

In accordance with FAQ 06-0011, "[10 CFR Part 50, Appendix R] III.G.3 Transition," alternative shutdown areas should be transitioned using the performance-based approach. Per the Harris Transition Report, the HNP control room credits the performance-based approach in accordance with NFPA 805, Section 4.2.4. However, the use of a time frame negotiated under the previous licensing basis to implement alternative shutdown appears to be inconsistent with the wording and intent of NFPA 805. In addition, the qualitative justification for the 10 minute window provided in Attachment G of the Harris Transition Report is not sufficient to meet the NFPA 805 requirements for a performance-based approach.

Please provide a performance-based analysis, in accordance with the appropriate requirements of NFPA 805, justifying the continued use of a 10 minute operator time window during alternate shutdown wherein no spurious equipment actuations are postulated to occur. In the justification, please address fires within electrical and control cabinets, as well as potential high energy arcing faults (HEAFs) in switchgear and associated bus ducts.

HNP RAI 3-32

On page C-12 of the HNP B-3 Table (Fire Area 12-A-CRC1 – Control Room Complex), Open Item 33 is being addressed by modification EC 54065, which proposes to install Meggitt fire rated cable to address spurious actuation of valves 1CT-102 and 1CT-105.

Do the cable runs for these valves terminate in Fire Area 12-A-CRC1? If yes, please note that operating experience and ongoing analyses demonstrate that Meggitt cable is still vulnerable to spurious actuations at the termination points. Given this concern, please describe how potential spurious actuations caused by fire damage to the cable termination points are being addressed.

HNP RAI 3-33

Page C-12 of the HNP B-3 Table (Fire Area 12-A-CRC1 – Control Room Complex) references EC 68656, ECR 5645 and ECR 5646 as the basis for resolution of Open Item 345, which is nominally identical to Open Item 54, and addresses an unisolated control cable for valve 1AV-AH6B and the spurious operation of valves 1SW-1171 and 1SW-1204.

However, per the description in Attachment S of the Harris Transition Report, EC 68656 appears to only address the spurious actuation of valve 1SW-1204. Please provide assurance that the spurious actuation of valves 1AV-AH6B and 1SW-1171 is addressed appropriately in ECR 5645 and/or ECR 5646, or provide an alternative description to resolve this issue.

HNP RAI 3-34

On page C-12 of the HNP B-3 Table (Fire Area 12-A-CRC1 – Control Room Complex), Open Item 35 identifies that SG PORVs may be spuriously operated in this and other fire areas; modification EC 62343 is cited as the resolution. The description of EC 62343 in Attachment S of the Harris Transition Report only discusses PORV 1MS-62.

However, the wording of Open Item 35 implies there are other PORVs in other fire areas that are vulnerable to spurious actuation which are being addressed by EC 62343. Please clarify whether or not this is indeed the case, and if other PORVs are involved, address how the issue of spurious actuation is being resolved for each of them.

HNP RAI 3-35

On page C-12 of the HNP B-3 Table (Fire Area 12-A-CRC1 – Control Room Complex), Open Item 37 does not clearly define the associated deficiency and states only that there are "emergent issues related to the chilled water system." In addition, the modification listed in the Change Evaluation/Modification Reference section (EC 64641) is not listed in Attachment S of the Harris Transition Report. Please provide the explicit details of the open item (i.e., what the deficient condition is) and either provide another reference for the modification, or add a description of modification EC 64641 to Attachment S of the Harris Transition Report.

HNP RAI 3-36

Based on some of the descriptions of potential fire damage included on page C-14 of the HNP B-3 Table (Fire Area 12-A-HV&IR – Heating, Ventilating, and Instrument Repairs, Reactor Auxiliary Building), Fire Area 12-A-HV&IR appears to encompass control room ventilation equipment. Please clarify whether or not this equipment includes charcoal filters. If so, provide a description of any charcoal filters present in the fire area.

In addition, the suppression summary for this fire area states that suppression systems are installed but not required. If present, does the charcoal filter system include an installed suppression system? If yes, please provide a description of the suppression systems installed to address/protect the charcoal filters present in the fire area.

HNP RAI 3-37

On page C-17 of the HNP B-3 Table (Fire Area 12-I-ESWPA – Emergency Service Water Intake Structure (Main Reservoir)), the Licensing Action field includes a "deviation from NUREG-0800, [Branch Technical Position] BTP Section C.5.a.(4) for fire dampers in exterior walls." From the associated discussion, it appears that this deviation is relying on tacit approval being carried forward from the original HNP SER (i.e., NUREG-1038) and its supplements. Please provide a valid, detailed technical justification for this deviation from the requirements of NFPA 90A.

HNP RAI 3-38

On page C-17 of the HNP B-3 Table (Fire Area 12-I-ESWPA – Emergency Service Water Intake Structure (Main Reservoir)), the detection summary for this fire area states that detection is installed but not required. However, the FSA calculation for this area (HNP-M/MECH-1173) credits fire detection for defense-in-depth, which appears to be inconsistent. Please clarify what controls will be maintained on the fire detection system installed in this fire area post transition.

HNP RAI 3-39

On page C-25 of the HNP B-3 Table (Fire Area 1-A-ACP – Auxiliary Control Panel Room), Open Item 10, which addresses adequate lighting along a required access path for Fire Area 1-A-BAL-C, references modification EC 1876 as the basis for resolution. However, EC 1876 is not listed in Attachment S to the Harris Transition Report.

In addition, it would appear that this open item should also include a reference to modification EC 58779, which deals with the availability of emergency lighting and states that additional lighting should be provided for Fire Area 1-A-ACP. Please verify that the correct modification(s) to address this issue have been included in Open Item 10 and provide/modify a description of the appropriate modification(s) in Attachment S to the Harris Transition Report.

HNP RAI 3-40

Several open items within the HNP B-3 Table address spurious actuation of Valve 1AF-55; however, the associated manual action to address potential fire damage to Valve 1AF-55, which is required to establish the credited path of auxiliary feedwater as well as hot standby decay heat removal, is listed as a defense-in-depth action and not a recovery action within the associated documentation. The basis for the acceptability of this condition is not apparent from the existing treatment of the spurious actuation of Valve 1AF-55 in the HNP B-3 Table or the associated FSA(s). Please provide the basis for acceptability of spurious actuation of Valve 1AF-55 and make the appropriate corrections to Attachment C of the Harris Transition Report.

HNP RAI 3-41

On page C-27 of the HNP B-3 Table (Fire Area 1-A-BAL-A – Reactor Auxiliary Building Unit 1 -- Lower Elevations), several entries for Fire Area 1-A-BAL-A are incomplete. No entries have been provided for Fire Zone, Description, Regulatory Basis, Phase, Performance Goal, Method of Accomplishment, or Reference Document. Please either update the HNP B-3 Table to include the required information for Fire Area 1-A-BAL-A, or provide a cross-reference to where the information is located within the Harris Transition Report.

HNP RAI 3-42

On page C-27 of the HNP B-3 Table (Fire Area 1-A-BAL-A – Reactor Auxiliary Building Unit 1 – Lower Elevations), the Engineering Evaluation field for the element includes an entry for the HNP-M/BMRK-0001-5, NFPA 72E Compliance Calculation. Based on the way this item is presented, it appears more appropriate to call it a licensing action rather than an engineering evaluation as it references prior NRC approval via an SER Supplement. Therefore, based on the overall approach being taken with regard to engineering evaluations, this evaluation may or may not be required to be included in the submittal. If the condition requiring this evaluation was approved via a previous licensing action, please revise the HNP B-3 Table accordingly.

HNP RAI 3-43

On page C-29 (Fire Area 1-A-BAL-A1 – Reactor Auxiliary Building Unit 1 – Analysis Area A1) and page C-31 (Fire Area 1-A-BAL-A2 – Reactor Auxiliary Building Unit 1 – Analysis Area A2) of the HNP B-3 Table, the Fire Zone list includes Fire Area 1-A-BAL-A12: "Reactor Auxiliary Building Unit 1 – A1/A2 Buffer Zone."

However, a review of the area diagrams for Fire Zone 1-A-BAL-A1 and Fire Zone 1-A-BAL-A2 reveals that the two fire areas appear to be fairly well separated. Please provide a clarifying discussion of what the A1/A2 buffer zone entails and why it is necessary.

HNP RAI 3-44

Attachment 2, "Fire Area 1-A-BAL-A – Scenario Discussions – Transition Change Evaluations," to calculation HNP-M/MECH-1116, Revision 1, lists Valve 1RH-63 as a potentially impacted component in Table A2-6, "Cables with Other Issues – Fire Area 1-A-BAL-A – Within the ZOI of an Ignition Source." However, Valve 1RH-63 is not listed as an open item in the HNP B-3 Table, or discussed elsewhere in the Harris Transition Report.

In safe shutdown calculation HNP-E/ELEC-0001, Revision 3, for fire zone 1-A-BAL-A2, Engineering Review statement ENG_REVIEW-042 states that "Valve 1RH-63 will remain available because 0330N, 0330P and 0330R have fault consequences of A (achieve) in RDM [Revised Design Methodology], which is the HNP licensing basis. This is based on the assumption of no inter-cable hot shorts as discussed in Supplemental SER 3, Section 9.5.1.4."

However, based on industry and NRC sponsored fire testing of cables, inter-cable hot shorts are required to be considered and the assumption of no inter-cable hot shorts can no longer be supported. Please explain how inter-cable hot shorts have been addressed for Valve 1RH-63 and update the appropriate section(s) of the Harris Transition Report accordingly.

HNP RAI 3-45

There appears to be a discrepancy between Attachment C, "NEI 04-02 Table B-3 – Fire Area Transition," and Attachment Y, "NFPA 805 Transition Risk Insights," of the Harris Transition Report and calculation HNP-M/MECH-1116, Revision 1, in that Open Item 348 on page C-42 references Attachment 2 to HNP-M/MECH-1116, but Attachment 2 to HNP-M/MECH-1116, Revision 1, does not list anything in the ZOI Summary Results column regarding component 1CC-252. However, component 1CC-252 is listed on page Y-29 under VFDs for

Fire Area 1-A-BAL-A, Cables without ERFBS, with "not within the ZOI of a risk-significant ignition source" as the entry under ZOI Summary. Please clarify which document/statement is correct, and address the final status/resolution for component 1CC-252.

HNP RAI 3-46

In Attachment D, "NEI 04-02 Table F-1 Non-Power Operational Modes Transition," of the Harris Transition Report, page D-3 states that approximately 16 additional power operated components were identified as being needed to support a NPO Key Safety Function (KSF) that were either not included on the post-fire safe shutdown equipment list, or the component had a different functional requirement for NPO than it did for safe shutdown, and required additional circuit analysis. Please provide a list of the additional components needed to support a NPO KSF, and for those that have a different functional requirement, describe the difference between the safe shutdown function and the NPO function.

HNP RAI 3-47

In Attachment D of the Harris Transition Report, on page D-4, the cited implementation reference (NEI 04-02) includes a requirement that the review identify locations where KSFs are achieved solely by crediting recovery actions (e.g., alignment of gravity feed). However, the description of the NPO review for HNP does not mention locations where KSFs are achieved solely by crediting recovery actions.

Please clarify whether or not the NPO review for HNP included consideration of recovery actions, and if there were any KSFs that are achieved solely by crediting recovery actions.

HNP RAI 3-48

In Attachment D of the Harris Transition Report, page D-6 states that "approximately 20 generic pinch points were identified during the performance of the NPO fire area reviews." Please describe how these generic pinch point locations will be identified to the plant for disposition during the NFPA 805 implementation process.

HNP RAI 3-49

In Attachment D of the Harris Transition Report, on page D-7, the passage regarding plant operating state (POS) 1A should be updated to reflect Revision 4 to NFPA 805 FAQ 07-0040, "Non-Power Operations Clarifications." In FAQ 07-0040, Revision 4, POS 1A is not screened; instead, normal fire protection defense-in-depth actions are taken. Please verify that the analysis performed for NPO at HNP is consistent with NFPA 805 FAQ 07-0040, Revision 4.

HNP RAI 3-50

In Attachment F, "Fire-Induced Multiple Spurious Operations – Resolution Methodology," of the Harris Transition Report, on page F-1, the HNP process/results description for Step 2, "Conduct an expert panel to assess plant specific vulnerabilities (e.g., per NEI 00-01, Revision 1, Section F.4.2[, "Expert Panel Review"])," of the NEI 04-02 FAQ 07-0038, "Lessons Learned on Multiple Spurious Operations," guidance includes a discussion about a second expert panel that was conducted in March 2008.

Please provide a discussion of the expert panel results, including expert panel member experience and area(s) of expertise, a list of multiple spurious operations (MSOs) that were reviewed, and the source of the MSOs that were reviewed (e.g., plant unique issue identified by the expert panel, generic industry MSO lists, operating experience, industry guidance documents, etc.).

HNP RAI 3-51

The current staff position with respect to the definition of "Primary Control Station" is as follows:

For components that have controls in the Main Control Room, operation of that component from any other location would be considered a recovery action if such operation were needed to achieve the nuclear safety performance criteria. For components that do not have controls in the Main Control Room, the primary control station is that location from which the component would normally be operated.

Therefore, the following applies to primary control stations:

1. The control station for a system or component is considered to be primary if it is the location where that system or component is normally operated. This situation applies to various auxiliary systems that are normally operated at a local control station by in-plant operators. NFPA 805 allows the use of this equipment via the local control station without considering it a recovery action.

2. The controls for a system or component specifically installed to meet the "dedicated shutdown" option of 10 CFR Part 50, Appendix R, Section III.G.3, are also considered to be primary. A system or component that has been specifically installed under the dedicated shutdown concept is a system or component that is operated from a location outside the control room (normally the remote, or alternate, shutdown panel) and is fully separated from the fire area where its use is credited. Similar to the previous item, this system or component cannot be operated from the control room. Therefore, operation of dedicated shutdown equipment from the remote, or alternate, shutdown panel would not be considered a recovery action since this would be the primary control station.

A special case exists for the controls of systems and components that have been modified to meet the "alternative shutdown" option of 10 CFR Part 50, Appendix R, Section III.G.3, to provide independence and electrical separation from the control room in order to address a fire-induced control room evacuation. (Note that this configuration is normally referred to as either a "remote shutdown panel" or "auxiliary shutdown panel.")

To be considered a primary control station as discussed above, the remote, or alternative, shutdown panel should meet the following criteria:

1. The location should be considered as the primary command and control center when the Main Control Room can no longer be used. The control room team will evacuate to this location and use its alternative shutdown controls to safely shut down the plant.

2. The location should have the requisite system and component controls, plant parameter indications, and communications so that the operator(s) can adequately and safely monitor and control the plant using the alternative shutdown equipment.

3. There should be more than one component being controlled from this location (i.e., a local control station provided to allow an individual component to be locally controlled, as in the local handwheel on a motor-operated valve, does not meet this definition).

If all of the applicable criteria above have been met, the remote shutdown panel or auxiliary shutdown panel may be considered a "primary control station" under NFPA 805 requirements.

However, the definition of "primary control station" provided in Attachment G, "Operator Manual Actions – Transition to Recovery Actions," of the Harris Transition Report appears to potentially exclude what the NRC staff would consider to be valid recovery actions.

Using the definition of "primary control station" provided above, please re-evaluate the manual actions being taken at HNP, reclassify as recovery actions as needed, and then update the risk evaluations (both base Fire PRA and additional risk of recovery actions) as necessary.

HNP RAI 3-52

In Attachment G of the Harris Transition Report, on page G-2, there is a brief discussion on the use of defense-in-depth manual actions. The licensee appears to be distinguishing defense-in-depth actions from recovery actions, based apparently on whether credit is taken in the associated risk analyses for the actions.

However, if manual actions are required for adequate defense-in-depth, they are considered as recovery actions under the NFPA 805 requirements since the licensee is identifying them as necessary to meet the performance-based aspects of the rule (i.e., acceptable risk, safety margins, and defense-in-depth).

The licensee is requested to document which, if any, of its defense-in-depth actions are being relied upon to comply with maintaining adequate defense-in-depth per NFPA 805 requirements, and to confirm the final list of actions which constitute recovery actions under the regulation.

In addition, please explain how the use of/reliance on defense-in-depth actions that are not modeled in the Fire PRA meets the requirements of NFPA 805, Section 2.4.3.3, which requires the fire risk evaluation to "...be based on the as-built and as-operated and maintained plant, and reflect the operating experience at the plant."

HNP RAI 3-53

NFPA 805 Section 4.2.3, "Deterministic Approach," asserts that the use of recovery actions automatically implies the use of the performance-based approach; and NFPA 805 Section 4.2.4, "Performance-Based Approach," states that "when the use of recovery actions has resulted in the use of this approach, the additional risk presented by their use shall be evaluated."

However, in Attachment G of the Harris Transition Report, page G-3 states that: "[Operator Manual Actions] OMAs that are allowed and/or have been previously reviewed and approved by

the NRC (as documented in an approved exemption/deviation/SER) can be transitioned without using the change evaluation process."

As outlined above, NFPA 805 requires assessment of the additional risk presented by the use of recovery actions (which, according to the NRC staff position, are nominally identical to OMAs for the purposes of the rule). Accordingly, please address the following discrepancies in Attachment G to the Harris Transition Report:

a. Attachment G lists 17 OMAs being transitioned as recovery actions. Please provide the evaluation(s) of the additional risk presented by the use of these 17 recovery actions.

b. Page G-6 asserts that the alternative shutdown recovery actions are not explicitly modeled in the Fire PRA. However, NFPA 805, Section 4.2.4, requires that the additional risk of recovery actions be evaluated. Please explain how this requirement is being met if the recovery action is not modeled in the Fire PRA.

c. Page G-8 states that "OMAs that can contribute significantly to the overall integrated decision-making process associated with the NFPA 805 transition should be identified." Please clarify whether or not this aspect was evaluated for HNP. If yes, what were the identified OMAs and what is the additional risk associated with their use?

d. Page G-9 states that "due to the low risk benefit of performance of defense-in-depth actions, the additional effort per NUREG-1852[, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire,"] does not add measurable benefit." However, NFPA 805, Section 2.4.2.1, "Nuclear Safety Capability Systems and Equipment Selection," states that the availability and reliability of equipment selected to meet the nuclear safety performance criteria shall be evaluated. The accomplishment (or failure) of defense-in-depth actions can directly impact that reliability. Please explain how this NFPA 805 requirement is being met if the defense-in-depth actions have not been evaluated for reliability.

HNP RAI 3-54

In Attachment G of the Harris Transition Report, on page G-6, the example cited in the third bullet states that an area without automatic detection and a high scenario conditional core damage probability (CCDP) may warrant a defense-in-depth action. Please clarify how the operator would know that he/she is required to take the defense-in-depth action if there is no detection in the area. In addition, explain how the defense-in-depth action could be accomplished if the operator does not know that there is a fire in the associated area.

HNP RAI 3-55

In Attachment G of the Harris Transition Report, on page G-10, Table G-1, "Feasibility Criteria – Recovery Actions and Defense-in-Depth Actions (Based on NFPA 805, Appendix B.5.2(e)[, "Methodology Success Path Resolution Considerations" regarding recovery actions,] and NEI 04-02, Revision 1)," contains a footnote which states that for emergency lighting, tools and equipment, actions in the Fire Area, and time, the "feasibility criterion will be performed for time critical recovery and defense-in-depth actions (less than 2 hours)."

The NRC staff position on recovery actions is that all recovery actions must be shown to be feasible, including consideration of the time available to perform the action before the plant experiences a non-recoverable condition. If tools or other equipment are required to perform the recovery action, they must be on hand and available. Therefore, crediting recovery actions in a Fire Area will require a performance-based analysis to demonstrate that the actions can be reliably accomplished when needed without causing a life-threatening condition for the operator.

In accordance with the above, please provide a sufficient justification to demonstrate that recovery and defense-in-depth actions that are required after a 2 hour time period meet the feasibility criteria in Appendix B, "Nuclear Safety Analysis," of NFPA 805.

HNP RAI 3-56

In Attachment I, "Definition of Power Block," of the Harris Transition Report, the licensee requests specific approval of their definition of the power block. In order to correctly review this portion of the submittal, the NRC staff requests the following:

a. Please provide a justification for excluding areas "K" and "M" of the Fuel Handling Building from the power block. The "Comments" section of Attachment I currently excludes these areas with no explanation or justification.

b. Please provide a justification for excluding the switchyard and other areas containing switchyard equipment from the power block. The description contained in Appendix I specifically mentions switchyard equipment as part of the power block.

c. Please explain the position of the major station transformers in HNP's power block formulation. If these transformers are meant to be included in the general list of power block equipment, identify the building/fire area they are associated with. If this is not the case, please provide a justification for their exclusion.

HNP RAI 3-57

In Attachment X, "Fire PRA Quality," of the Harris Transition Report, on page X-1, the discussion under Determination of Capability Categories makes the statement that "internal flood (IF) is not required for the application." However, actuation of fire suppression water systems, either as a result of a fire or spuriously, can have a similar impact as IF from pipe and other equipment ruptures. Accordingly, please provide an explanation of how actuation of fire suppression water systems, either as a result of a fire or spuriously, was evaluated at HNP.

HNP RAI 3-58

In Attachment Y of the Harris Transition Report, on page Y-85, modification EC 62343 is listed as the resolution for potential fire damage to three cables associated with pressurizer PORV 1RC-114. However, this conflicts with the information presented in Attachment S of the Harris Transition Report. Based on the discussion provided in Attachment S, EC 62343 appears to address potential spurious actuation of SG PORV 1MS-62. Accordingly, please provide a discussion on how potential fire damage to Cable 0149Q, Cable 0150E, and Cable 0310P is being addressed in the nuclear safety performance analysis.

HNP RAI 3-59

In Attachment Y of the Harris Transition Report, page Y-94 discusses VFD 1CS-166 for Cable 0245M and Cable 0245P regarding the volume control tank outlet valve. However, these cables are not similarly addressed anywhere in the HNP B-3 Table. Please clarify how this VFD is being addressed/resolved at HNP.

HNP RAI 3-60

In Attachment Y of the Harris Transition Report, on page Y-109, the Overview of Changes section lists Valve 1AF-55 as one of the variances from deterministic separation requirements addressed to resolve an associated OMA. However, Valve 1AF-55 is not listed in the table of VFDs provided for the associated fire area (1-A-SWGRB). Please clarify how the VFD for Valve 1AF-55 is being addressed/resolved at HNP.

HNP RAI 3-61

In Attachment Y of the Harris Transition Report, on page Y-109, the Overview of Changes section states that the variances described in HNP B-3 Table open items 15, 16, 19, and 147 are addressed. However, the HNP B-3 Table also lists open items 17, 18, and 148 associated with valve operation in Fire Area 1-A-SWGRB. These three open items appear to be addressed by either modifications or risk assessment as identified in the VFD lists provided for other fire areas. Please provide an explanation for why these three open items were not included in the Overview of Changes section for Fire Area 1-A-SWGRB.

HNP RAI 3-62

In Attachment Y of the Harris Transition Report, on page Y-119, the VFD list for Fire Area 12-A-CR identifies Valve 1CS-196 as a component that resides in the Main Control Room fire compartment (FC) associated with the Main Control Board (FC02_MCB). Please provide a discussion of how NRC Information Notice 92-18, "Potential for Loss of Remote Shutdown Capability During a Control Room Fire," was addressed for Valve 1CS-196. In this discussion, include justification for any reliance on the 10 minute exclusion window for spurious actuations.

HNP RAI 3-63

There NRC staff has noted several discrepancies between the VFDs presented in Attachment Y and those presented (i.e., as open items) in Attachment C of the Harris Transition Report, in that not all fire areas containing VFDs have been adequately addressed in Attachment Y.

One example is Fire Area 12-A-CRC1. Attachment C lists open items 101, 33, 345, 346, 35, and 37 associated with this fire area. However, Attachment Y contains no discussion of Fire Area 12-A-CRC1 other than listing it in the tables that address CDF and LERF of fire sources.

In addition, Open Item 101 and Open Item 346 reference Attachment 2 to calculation HNP-M/MECH-1126. However, Revision 1 to calculation HNP-M/MECH-1126 deleted the original change evaluation discussion contained in Attachment 2 (replacing it with a "Record of Lead Review") stating that there were no VFDs remaining for the fire area.

Further, from review of Attachment S, "Plant Modifications," of the Harris Transition Report, it appears that modification EC 70895 will provide protection for Valve 1AF-143 (and others) in Fire Area 12-A-CRC1. If this modification is being performed to address Open Item 346, please revise Attachment C accordingly. Otherwise, provide the proper disposition for Open Item 346.

In addition, please 1) provide a discussion to address the remainder of the apparent issues outlined above, and 2) evaluate the extent of condition of similar VFD discrepancies in the supporting documentation for other fire areas, and ensure that each item is clearly specified.

HNP RAI 3-64

Additional information is required by the NRC staff in order to support a conclusion that electrical protective device coordination has been assured in accordance with the requirements of NFPA 805, Section 2.4.2.2.2, "Nuclear Safety Capability Assessment – Other Required Circuits." This section states that circuits which share a common power supply with circuits required to achieve the nuclear safety performance criteria shall be evaluated for their impact on the ability to achieve the nuclear safety performance criteria.

The applicable reference cited in the HNP B-2 Table (HNP-E/ELEC-0001, "Safe Shutdown in Case of Fire and Fire Hazards Analysis," Revision 2) under numerous safe shutdown elements was developed to address the effects of fire during full power operations. As a result, this calculation may not adequately bound all of the nuclear safety concerns established in NFPA 805, such as non-power operations. During the onsite regulatory audit at HNP, plant representatives acknowledged certain deficiencies in the existing study (i.e., backfeed).

Please provide a supplemental discussion/justification on the use of HNP-E/ELEC-0001 to meet the requirements of NFPA 805, Section 2.4.2.2.2, and/or address other means that are being used at HNP to appropriately meet the requirements of the rule.

HNP RAI 3-65

Additional information is required by the NRC staff in order to support a conclusion that HNP meets all aspects of the NFPA 805, Section 2.4.2.2.2, requirements with regard to common enclosure circuit/cable issues. This section states that circuits which share common enclosures with circuits required to achieve the nuclear safety performance criteria shall be evaluated for their impact on the ability to achieve the nuclear safety performance criteria.

The applicable references cited in the HNP B-2 Table under numerous safe shutdown elements do not provide a clear technical description of how the common enclosure issue was addressed during all modes of operation at HNP, as well as for all non-essential cables of concern.

Please provide a supplemental discussion/justification on the use of the current documentation to meet the requirements of NFPA 805, Section 2.4.2.2.2, and/or address other means that are being used at HNP to appropriately meet the requirements of the rule.

HNP RAI 3-66

NFPA 805 requires licensees to provide reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from establishing and maintaining the

fuel in a safe and stable condition. During NPO modes, spurious actuation of valves can have a significant impact on the ability to maintain decay heat removal and inventory control. Please provide a description of any actions being taken to minimize the impact of fire-induced spurious actuations on power operated valves (air operated valves (AOVs) and/or motor operated valves (MOVs)) during NPO (i.e., pre-fire rack-out, pinning valves, isolating air supplies, etc.).

HNP RAI 3-67

Section G.5.3.1.2, "Non-Alternative Shutdown Actions – Other Actions," of the Harris Transition Report, states that "due to the low risk benefit of performance of defense-in-depth actions, the additional effort per NUREG-1852 does not add measurable benefit." Since NUREG-1852 addresses OMA feasibility and reliability criteria in a qualitative manner, and defense-in-depth actions are addressed qualitatively by HNP, please provide the basis for this statement (e.g., describe what constitutes the "additional effort" involved with an assessment of the associated defense-in-depth action and why it would not add a "measurable benefit").

In addition, please clarify whether the feasibility criteria listed in Table G-1, "Feasibility Criteria – Recovery Actions and Defense-in-Depth Actions," align with those from NUREG-1852. If there is misalignment, such that the G-1 Table criteria exclude or inadequately reflect any of the NUREG-1852 criteria, provide the basis for criterion inclusion/exclusion in the G-1 Table and discuss how assurance is provided that an important criterion is not overlooked.

HNP RAI 3-68

In Attachment G of the Harris Transition Report, on page G-11, there is a discussion of how thermal-hydraulic (T-H) analyses are used in the feasibility evaluation for OMAs, both recovery and defense-in-depth actions. Please provide a discussion of how the T-H analyses are used in the reliability evaluation for OMAs; or, if they are not used, provide the basis as to why not.

4. Please provide the following information concerning meeting the radioactive release performance criteria:

HNP RAI 4-1

The Radioactive Release Goal, as expressed through the Radioactive Release Objective and Performance Criteria, is one of the key public safety features of the NFPA 805 standard.

However, the material submitted regarding HNP's radioactive release transition, located in Section 4.4, "Radioactive Release Performance Criteria," and Attachment E, "NEI 04-02 Table G-1 – Radioactive Release Transition," of the Harris Transition Report, contains insufficient detail for the NRC staff to properly review this issue. Accordingly, the NRC staff requests the following information regarding the radioactive release transition process at HNP:

a. Provide a summary description of how (i.e., list and/or describe the attributes, features, etc.) the screened-in pre-fire plans provide guidelines for the containment and monitoring of potentially contaminated fire suppression water and products of combustion. This should be done on a fire area basis, as appropriate.

b. Provide a summary description of how (i.e., list and/or describe the attributes, features, etc.) the fire engineering controls provide for the containment and monitoring of potentially contaminated fire suppression water and products of combustion. This should be done on a fire area basis, as appropriate.

c. Provide a summary description of how (i.e., list and/or describe the attributes, features, etc.) the fire brigade training materials provide instruction for the containment and monitoring of potentially contaminated fire suppression water and products of combustion. This should be done on a fire area basis, as appropriate.

d. Provide the schedule for completion of the fire brigade training material changes.

e. Expand upon, and provide technical justification for, the conclusions presented in Section 4.4 and Attachment E of the Harris Transition Report concerning radioactive release from containment during low power and shut down conditions.

f. Explain why the original yard pre-fire plan was screened out of the review, and clarify whether, and on what schedule, the new version developed to address radioactive materials areas and other potentially contaminated storage areas will be re-reviewed.

g. Explain the implications of the fuel handling building's normal exhaust not being filtered.

h. Describe the implications of the turbine building being open to the outside atmosphere.

i. Describe any potential implications of there being floor drains that lead to monitored tanks only at the 240 foot elevation of the turbine building.

j. Provide a reference to where the results of the Radioactive Release reviews are maintained at HNP.

5. Please provide the following information concerning risk assessments and plant change evaluations:

HNP RAI 5-1

During the onsite regulatory audit at HNP, the NRC staff identified apparent anomalies in the CDF and LERF calculations for Fire Compartment 03 (FC03). The results of CDF and LERF calculations performed for each potential fire source in FC03 were compared with the information contained in Attachment Y, "NFPA 805 Transition Risk Insights," of the Harris Transition Report, and HNP-F/PSA-0081, "Harris Fire PRA – Support for NFPA 805 Transition."

For a number of components in FC03 (e.g., FC03-S1521 – Annunciator Cabinet 2), the reported values for LERF were a factor of two higher than the reported values for CDF, which is not a correct result (i.e., the calculated LERF value must always be less than or equal to the CDF value). Although the associated risks for the affected FC03 components are small, the anomaly does not appear to be a result of the screening method used for low probability events.

A review of Attachment 19 to calculation HNP-F/PSA-0079, "Harris Fire PRA – Quantification Calculation," Revision 1, reveals that except for FC03, the ratio of LERF to CDF for all other fire compartments is less than 15 percent. However, for FC03, this ratio is nearly 60 percent.

Further, a review of the data spreadsheets associated with HNP-F/PSA-0079 indicate that 12 fire scenarios in FC03 have LERFs that are greater than CDFs, and another 23 fire scenarios have LERFs between 60 and 100 percent of their CDFs. In fact, of the 59 scenarios where the ratio of fire LERF to CDF exceeds 20 percent, all but five are associated with FC03.

Please provide an explanation for these apparent anomalies in the CDF and LERF calculations for FC03, and clarify what should be the fire LERF for FC03. In addition, discuss how this affects the total fire LERF and any associated delta-LERF calculations for FC03 and other potentially impacted fire compartments.

During the onsite regulatory audit at HNP, plant representatives suggested that the very high LERF ratio for FC03 may be the result of truncation errors in the associated calculations. If this is so, please explain why this truncation error appears only for FC03 (i.e., no other compartment showed such a high LERF ratio, although there are absolute LERF values that are comparable in other compartments). Alternatively, if the LERF value for FC03 is correct and the truncation error occurred in the CDF calculation, then the reported CDF for FC03 (9.62E-7/year) could be up to five times higher. Therefore, please discuss how HNP has assured that the truncation effect is isolated only to FC03 and does not affect the CDF or delta-CDF values significantly.

HNP RAI 5-2

NFPA 805, Section 2.4.1.2.1, "Fire Modeling Calculations – Acceptable Models," states:

> Only fire models that are acceptable to the authority having jurisdiction shall be used in fire modeling calculations.

Section 4.5.2, "Fire Modeling," of the Harris Transition Report states:

> The approach taken at HNP to simplify the analysis process incorporates features of several fire model tools covered by NUREG-1824[, "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications,"] as well as additional features.

Please identify the specific fire models, tools, and correlations (such as the Beyler/Shokri detailed target heat flux correlation) used at HNP, including the "additional features" referred to in Section 4.5.2 of the Harris Transition Report. In addition, provide specific version information (e.g., for the Consolidated Fire Growth and Smoke Transport (CFAST) model and/or the Fire Dynamics Simulator (FDS)) for any fire modeling software products used.

HNP RAI 5-3

NFPA 805, Section 2.4.1.2.3, "Validation of Models," requires the verification and validation (V&V) of all fire models used in the associated analysis. Additionally, NFPA 805, Section 2.7.3.2, "Verification and Validation," and Section 2.7.3.3, "Limitations of Use," provide detailed requirements for the V&V and limitations of use for applicable fire models.

Section 4.5.2 of the Harris Transition Report states:

> The approach taken at HNP to simplify the analysis process incorporates features of several fire model tools covered by NUREG-1824 as well as additional features. The approach is collectively referred to as the Fire Modeling Generic Treatments. The analysis basis and V&V documentation was provided in a proprietary Hughes Associates, Inc. report to the NRC on January 24, 2008. The report entitled "Generic Fire Modeling Treatments" is effectively a technical reference guide, a user's guide, and the V&V basis.

Please provide assurance that the fire models and correlations identified in "Generic Fire Modeling Treatments" were applied within their appropriate scopes and limitations. In addition, please provide a more detailed description of the V&V status for the applied fire models and correlations at HNP. One approach would be to note the consistencies and inconsistencies of the HNP V&V efforts with American Society for Testing and Materials (ASTM) E1355-05a, "Standard Guide for Evaluating the Predictive Capability of Deterministic Fire Models," and justify the inconsistencies. Other approaches for judging the V&V status of the applied models and correlations may also be acceptable.

HNP RAI 5-4

NFPA 805, Section 2.7.3.4, "Qualification of Users," states:

> Cognizant personnel who use and apply engineering analysis and numerical models (e.g., fire modeling techniques) shall be competent in that field and experienced in the application of these methods as they relate to nuclear power plants, nuclear power plant fire protection, and power plant operations.

Please describe what constitutes the appropriate qualifications for the HNP engineers to use and apply the methods and tools included in the engineering analyses and numerical models. In addition, please discuss the licensee's process/procedure for ensuring adequate qualification of the personnel performing the fire analyses and modeling activities.

HNP RAI 5-5

NFPA 805, Section 2.4.1.4, "Defining the Fire Scenario," requires that fire scenarios consider all operational conditions of the plant, and other characteristics as necessary, when demonstrating the capability to meet the performance criteria.

NFPA 805, Section 2.4.1.4(c), "Plant Area Configuration," states:

> The area, zone, or room configuration shall consider the plant construction surrounding the area, area geometry, (e.g., volume, ceiling height, floor area, and openings), geometry between combustibles, ignition sources, targets, and surrounding barriers.

Of specific concern are fire location corner and wall proximity effects, which can affect entrainment and flame height, as well as ZOI and target impacts.

Please address how the effects of fires located near corners and walls were accounted for in the HNP analyses; specifically in the Fire Modeling Generic Treatments and the discussion of the CFAST model in NED-M/MECH-1006, "Generic Fire Modeling Treatments." In addition, for specific ignition sources identified as being in close proximity to walls and/or corners, the licensee should describe the data collection account for such cases.

HNP RAI 5-6

NFPA 805, Section 2.4.1.2.1, states that "only fire models that are acceptable to the authority having jurisdiction shall be used in fire modeling calculations."

During the onsite regulatory audit at HNP, fire models were identified as having been used for special purposes in specific fire areas, as well as for the modification of damage criteria. However, the methods, input data, models, and verified and validated results are not explained in sufficient detail in Section 4.5.2 of the Harris Transition Report for the NRC staff to properly evaluate this issue. Accordingly, please address the following:

a. Provide detailed descriptions of these features for the following rooms/ areas:

- Chiller Room Analysis (HNP-M/MECH-1140)
- Primary Instrumentation and Control (PIC) Room Analysis (HNP-M/MECH-1193)
- Cable Spread Room (HNP-M/MECH-1195)
- Switchgear Room "B" (HNP-M/MECH-1196)
- Switchgear Room "A" (HNP-M/MECH-1197)
- Motor Control Center (MCC) Fire Analysis (HNP-M/MECH-1207)
- Cable Damage Calculation (HNP-M/MECH-1194)

b. Describe the extent to which fire modeling was used to draw conclusions by utilizing different criteria and modeling techniques than those described in NUREG/CR-6850, "EPRI/NRC-RES [Research] Fire PRA Methodology for Nuclear Power Facilities."

Address the following:

- Zones of influence
- Target determination
- Ignition source impact as it differs from that outlined in NUREG/CR-6850 and/or "Generic Fire Modeling Treatments"

c. Provide an explanation of the post-processing routine used to further characterize data that is obtained from the CFAST model as a means to ascertain fire induced flow effects from the electrical equipment.

d. The hot gas layer was calculated using models different from those referenced in NUREG/CR-6850. Provide sufficient detail to delineate what models were used to calculate the hot gas layer (as described in calculation HNP-M/MECH-1128) and zones of influence (as described in calculation HNP-M/MECH-1129).

HNP RAI 5-7

The plant configuration that yields the baseline Fire PRA results is not clearly identified. Specifically, the licensee's submittal does not identify if there are any plant modifications or procedure changes, implemented in the plant but not necessarily reflected in the PRA model, which are used to generate the PRA results that support the NFPA 805 LAR.

Further, since a November 2010 implementation date is identified in the LAR, any plant modifications or procedure changes planned to be implemented by this date, but not currently reflected in the PRA model, need to be identified. If any such plant changes exist, they must be discussed and dispositioned as not significantly impacting the PRA results presented to support the existing basis of the HNP NFPA 805 LAR. Note that this requirement encompasses non-fire modifications, as well as the proposed fire modifications, discussed in the LAR.

Please provide an additional discussion to adequately address the issue(s) outlined above.

HNP RAI 5-8

In the discussion of the technical adequacy of the Fire PRA in Attachment X, "Fire PRA Quality," of the Harris Transition Report, Table X-2, "HNP Summary of Evaluated Capability," identifies the capability category for each aspect of the HNP Fire PRA.

However, Table X-2 is unclear on the identification of the specific criteria upon which this capability assessment is based (i.e., is it simply reflecting NRC staff review results, focused scope peer review results, or the results of a licensee self-assessment). The technical basis upon which the capability of the HNP Fire PRA is judged must be clearly identified.

Please provide an additional discussion to adequately address the issue(s) outlined above.

HNP RAI 5-9

Section 4.0, "Assumptions," of calculation HNP-F/PSA-0079, Revision 1, identifies assumptions used in the development and quantification of the Fire PRA model. However, several of these assumptions, used to support the HNP NFPA 805 application, do not appear to have an appropriate basis identified. The NRC staff requires additional information to assess the appropriateness of these Fire PRA assumptions. Accordingly, please address the following:

a. Assumption 4 – It is assumed that detection of a fire will occur within 15 minutes, even with no operational detectors available. This assumption would only be warranted if the fire causes some type of alarm or other operational upset condition that would be detectable in the control room such that personnel would be dispatched to the area of the fire to investigate.

b. Assumption 5 – It is assumed that a fire watch is 100 percent effective in preventing fires from developing to the point of a hot gas layer (HGL). This assumption is too broad as written, since periodic fire watches would not be expected to be 100 percent effective, and even a continuous watch in a particular area may not be able to prevent all types of fires that could ultimately lead to formation of a HGL.

c. Assumption 6 – It is stated as an assumption that "continuous fire watch personnel will take first action to suppress an observed fire". It is unclear to the NRC staff what entails the intent and affect of this assumption.

d. Assumption 7 – It is assumed that in the absence of a detailed circuit analyses, any fire with a target set causes a plant trip with loss of feedwater; it is then stated that this assumption may be set aside under some conditions. The statement regarding application of a conditional trip probability is not clear as to its specific meaning or intent, and appears to contradict the first part of this assumption. Further, Table 1 in the body of calculation HNP-F/PSA-0079 identifies conditional probabilities of plant trip as being pervasive, such that this assumption does not appear to be a common assumption.

e. Assumption 8 – It is assumed that cable trays in the ZOI are stacked above the source; however, it is not stated whether or not this assumption is conservative. If it is not conservative, this assumption should be addressed by appropriate sensitivity studies.

f. Assumption 9 – It is assumed that MCCs are closed cabinets and internal cubicle fires will not propagate to external targets. The intent and proposed effect of this assumption is unclear, especially since it is either verifiably true or not true. In addition, no basis is provided for the second part of this assumption regarding faults which could cause the MCC to become an open configuration.

g. Assumption 10 – It is assumed that walls and corners have no impact on electrical cabinet fire growth and propagation to the first target cables; however, it is not stated whether or not this assumption is conservative. If it is not conservative, this assumption should be addressed by appropriate sensitivity studies.

HNP RAI 5-10

Section 4.0 of calculation HNP-F/PSA-0079, Revision 1, identifies assumptions used in the development and quantification of the Fire PRA model. Section 6.7, "Sources of Uncertainty," identifies sources of uncertainty and characterizes them as either conservative or not.

However, none of these assumptions or sources of uncertainty have been characterized as to whether they are key to the results contained in the HNP NFPA 805 application. In addition, appropriate sensitivity analyses have not been presented to determine the quantitative impact.

Accordingly, the licensee should provide 1) an evaluation of which assumptions and sources of uncertainty are considered to be key to the NFPA 805 application, and 2) appropriate sensitivity analyses of key assumptions and sources of uncertainty to demonstrate that they do not have a potentially significant impact on the results contained in the application.

HNP RAI 5-11

Section 8.1, "Hemyc and MT Delta-CDF and Delta-LERF," of calculation HNP-F/PSA-0081, Revision 0, identifies the application of a compartment-level and component-level screening criteria. However, this screening criteria is not addressed in Revision 1. Please clarify whether or not such a screening method is still employed. If so, provide the basis for acceptability of this

screening approach to ensure that the reported delta-risk values are calculated appropriately (i.e., conservative and bounding considering the screening approach).

HNP RAI 5-12

The delta-risk calculations presented in the HNP NFPA 805 application do not include any risk contributions from recovery actions, including those associated with control room abandonment scenarios such as the local actions required as a part of the safe shutdown methods (i.e., those not conducted at the main control panel). Please provide revised delta-risk calculations which include these recovery action contributions.

HNP RAI 5-13

Section 5.2.3, "Fire Zone Data," of calculation HNP-F/PSA-0079, Revision 1, states that "if the fire zone is continuously occupied a brigade response time of 2 minutes was applied."

While it might be expected that a human response to a fire would occur very rapidly in a continuously occupied zone, the time for the fire brigade to muster and respond, even if notified immediately, would likely be more than 2 minutes.

Accordingly, please discuss whether or not non-brigade response by personnel in the location undergoing the fire is being assumed to achieve the same level of success in terms of suppression effectiveness, etc., as a fire brigade response. If so, provide a justification for this conclusion as well as a discussion of the effect of assuming longer brigade response times.

HNP RAI 5-14

Section 5.2.5, "Transient Source Ignition Frequencies," of calculation HNP-F/PSA-0079, Revision 1, states that "transient fires due to cutting and welding have been determined to have a negligible contribution due to the presence of a continuous fire watch."

However, Bins 6, 24, and 36 in Table 6-1, "Fire Frequency Bins and Generic Frequencies," of NUREG/CR-6850, assign ignition frequencies to "transient fires caused by cutting or welding" that range from approximately 0.005 to 0.01 per reactor-year. In addition, the non-suppression probability for welding fires, based on historic fire event data which presumably incorporated the presence of a continuous fire watch for at least some, if not most, "hot work" activities, does not reach the lower limit of 0.001 per reactor-year until approximately 35 minutes have elapsed (reference Table P-2, "Probability Distribution for Rate of Fires Suppressed per Unit Time," of NUREG/CR-6850). Finally, if only five minutes is available for the manual suppression of a cutting or welding fire, the non-suppression probability is 0.38 per reactor-year

In accordance with the above discussion, provide the basis for this apparently *a priori* dismissal of transient fires due to cutting and welding, given the presence of a continuous fire watch, and provide a risk estimate for what would be the effect of not dismissing these types of fires.

HNP RAI 5-15

Section 5.4.2.1, "[High Energy Arcing Fault] HEAF Fire Growth," of calculation HNP-F/PSA-0079, Revision 1, states that "after the HEAF, a source fire of 69 kilowatts (kW) is assumed to propagate to secondary combustibles."

Section M.6.1, "Risk Quantification of High-Arcing Fault Events," of NUREG/CR-6850 states that for the ensuing fire after the energetic phase, a generic frequency for HEAFs should be assigned as listed in Task 6, "Fire Ignition Frequencies," and apportioned using the location and ignition source weighting factors for the equipment under analysis.

Section G.7, "Supplemental Information: Examples of Determining Heat Release Rates (HRRs) for Typical Electrical Cabinets in Nuclear Power Plants," of NUREG/CR-6850, gives the following guidance for HEAF sources:

> 4160V Switchgear: ...Because of the single bundle control wiring and separation of the control and power cables in separate compartments, the fire in the switchgear will remain confined to a single bundle and the distribution with 65 kW and 200 kW as the 75th and 98th percentiles can be assumed if the cables are qualified.
>
> 480V MCC: ...MCCs of this type with qualified cable are considered to satisfy the criteria established for a 65 kW HRR as the 75th percentile. In contrast, if the cabinet has unqualified cable, and assuming a closed door, a value of 220 kW would be assigned as the 75th percentile.

In accordance with the above discussion, please provide the basis for the apparent *a priori* limiting of the propagation of a source fire from an HEAF to the 69 kW HRR (i.e, vs. 200 kW).

HNP RAI 5-16

Section 5.4.3, "Non-Suppression Probability," of calculation HNP-F/PSA-0079, Revision 1, states, in part, that failure of prompt detection is assumed to have a probability of 0.0 if the compartment contains highly sensitive fire detectors.

Section P.1.3, "Solving the Detection-Suppression Event Tree," of NUREG/CR-6850 states:

> Prompt detection should be only credited when a continuous fire watch is assigned to an operation, or a high-sensitivity smoke detection system is installed. If a high-sensitivity smoke detection system is credited, the failure probability of the system should be considered. If in-cabinet smoke detection devices are installed in the electrical cabinet postulated as the ignition source, the analyst should assume that the fire will be detected in its incipient stage. This incipient stage is assumed to have a duration of 5 minutes. In order to account for these 5 minutes, the analysts should add them to the time to target damage (or, equivalently, add them to the time available for suppression).
>
> Prompt suppression refers specifically to suppression actions by a fire watch, and can be credited following prompt detection in hot work fire scenarios only.

Given this limitation from NUREG/CR-6850 for taking into consideration the failure probability of the system when credit for high sensitivity smoke detection is incorporated into the analysis, please provide the basis for assuming that failure of prompt detection in a compartment, not just an electrical cabinet, merits the high sensitivity smoke detection credit (i.e., a probability of 0.0).

HNP RAI 5-17

Section 5.8.1, "Initial Qualitative Assessment (Step 1)," of calculation HNP-F/PSA-0079, Revision 1, states that "compartments that do not generate a HGL internally are not considered to be able to generate multiple compartment damage.

Please provide a basis for the apparent assumption that an HGL is the only means by which fire or fire effects could propagate between multiple compartments.

HNP RAI 5-18

Section 5.8.2, "Initial Ignition Frequency Assessment (Step 2)," of calculation HNP-F/PSA-0079, Revision 1, states that "if the multi-compartment ignition frequency is less than 1E-7 per year no further evaluation is performed."

Section 5.8.3, "Detailed Qualitative Assessment (Step 3)," of calculation HNP-F/PSA-0079, Revision 1, states that "if no issues are identified with the compartment barriers and the compartment barriers are all three hour rated barriers or evaluated as equivalent they can be deemed acceptable if the HGL multi-compartment ignition frequency is less than 1E-6 per year."

These screening values are based on HGL ignition frequencies in compartments for which the CCDP could be close to 1.0, or have the potential to increase to values close to 1.0 due to failures in the propagated compartment. Accordingly, please provide the basis for the "no further evaluation is performed" screening value of less than 1.0E-7 per year. In addition, discuss the correspondence, if any, between the less than 1.0E-7 per year screening criterion and that for the less than 1.0E-6 per year screening criterion.

HNP RAI 5-19

Section 6.4.1, "Risk Insights – FC35, "B" Switchgear Room," of calculation HNP-F/PSA-0079, Revision 1, states that "modifications to protect cable trays from HEAFs have been credited in this room as well as incipient detection in the transfer panel."

Please discuss which modifications have been credited to protect cable trays against HEAFs in the "B" Switchgear Room.

HNP RAI 5-20

Attachment 4, "Main Control Room Analysis," to calculation HNP-F/PSA-0079, Revision 1, includes Table 3, "Main Control Board Fire Consequence Characterization – Successful Fire Suppression."

Based on the discussion presented in Table 3, as well as working the Table 3 analyses "forward" and "backward," the following minimum groupings appear to generate a CCDP equal

to 1.0 (or close enough that the risk significance merits further analysis): (1) MCB - A1; (2) MCB - A2; and (3) MCB - D1. However, there are other "non-minimal" groupings contained in Table 3 (i.e., MCB - B1 and MCB - D2), each of which includes at least one cabinet that is also associated with the higher risk significance groupings.

Given the discussion above, please specify which groupings actually result from the analyses associated with Table 3.

HNP RAI 5-21

Section 4, "Determine Environmental Conditions Given Fire," of Attachment 4 to calculation HNP-F/PSA-0079, Revision 1, states, in part, that combining the frequency terms for transient combustibles yields: 5.7E-4 x 1.0E-2 x 2.63E-2 = 1.50E-7 per year.

It appears that a transient ignition frequency of 5.7E-4 per year is assumed. However, this value is actually the conditional probability of damage given a fire event, per Figure L-1, "Likelihood of Target Damage Calculated as the Severity Factor Times the Probability of Nonsuppression for MCB Fires," of NUREG/CR-6850.

Bin 7 of Table 6-1,"Fire Frequency Bins and Generic Frequencies," in NUREG/CR-6850, gives the transient ignition frequency in the Control/Auxiliary/Reactor Building as 3.9E-3 per year.

Accordingly, please revise these calculations, if appropriate, using the correct NUREG/CR-6850 value, or provide the basis for the value currently assumed for transient ignition frequency.

HNP RAI 5-22

Throughout Section 5.3, "Main Control Board Fire Initiating Events – Successful Fire Suppression," and Section 5.4, "Main Control Board Fire Initiating Events – Fire Suppression Failure Scenarios," of Attachment 4 to calculation HNP-F/PSA-0079, Revision 1, the ignition frequency calculations assume that the probability of spurious actuation is equal to 0.30.

The following tables in NUREG/CR-6850 provide failure mode probability estimates given cable damage for various cable types/configurations:

Table 10-1, "Thermoset Cable with Control Power Transformer (CPT)," gives a failure probability of 0.30 as the best estimate for a multi-conductor cable with an internally generated hot short in a cable tray.

Table 10-2, "Thermoset Cable without CPT," gives a failure probability of 0.60 as the best estimate for a multi-conductor cable with an internally generated hot short in a cable tray.

Table 10-3, "Thermoplastic Cable with CPT," gives a failure probability of 0.30 as the best estimate for a multi-conductor cable with an internally generated hot short in a cable tray.

Table 10-4, "Thermoplastic Cable without CPT," gives a failure probability of 0.60 as the best estimate for a multi-conductor cable with an internally generated hot short in a cable tray.

Given the above discussion, please provide the basis for using a spurious actuation probability of 0.30 instead of 0.60 as the best estimate for failure mode probability in the ignition frequency calculations throughout Section 5.3 and Section 5.4 of Attachment 4 to calculation HNP-F/PSA-0079, Revision 1. (For example, was a CPT indeed assumed to protect all the circuits in the Main Control Room analysis?)

HNP RAI 5-23

Table 1, "PRA Circuit Resolution for All Areas Throughout HNP," of Attachment 6, "Circuit Analysis Probabilities," to calculation HNP-F/PSA-0079, Revision 1, lists direct current (DC) Cable 0250A and Cable 0251A as susceptible to intracable and intercable failures with the same best estimate failure probability as for alternating current (AC) cables (i.e., 0.60).

In light of recent developments suggesting that DC cable failure probabilities can be greater than those for AC cables, please provide the basis for assuming the same 0.60 failure probability value for both DC and AC cables.

In addition, please address whether or not these DC cables should be assumed to always fail, given the generally conservative approach used throughout Attachment 6. (Note that this approach would apply throughout Attachment 6 wherever DC cable failures are assumed.)

HNP RAI 5-24

Table 1 of Attachment 6 to calculation HNP-F/PSA-0079, Revision 1, identifies Cable 0156B and Cable 0156L as subject to intracable faults, but the failure probability given is zero, presumably due to the presence of a dedicated conduit (per the "PRA Circuit Resolution" field).

However, Tables 10-1 through 10-4 of NUREG/CR-6850 assign non-zero probabilities for intracable faults even when there is a conduit present. Accordingly, please provide a justification for the assignment of a zero failure probability to these cables. (Note that this issue would apply throughout Attachment 6 wherever there are similar assumptions.)

HNP RAI 5-25

Table 1 of Attachment 6 to calculation HNP-F/PSA-0079, Revision 1, identifies Cable 0330E and Cable 0330F as subject only to intercable faults, but the higher intracable failure probability (0.30 with CPT, per Table 10-1 and/or 10-3 of NUREG/CR-6850) is assumed.

While this appears to be conservative, please discuss the basis for assignment of the higher intracable failure probability to the intercable hot shorting for these cables. (Note that this issue would apply throughout Attachment 6 wherever there are similar assumptions.)

HNP RAI 5-26

Section 9.9, "Solid-Bottom Cable Trays," of Attachment 16, "Fire Protection Initiatives Project (FPIP)-0150 – Ignition Source Characterization and Fire-Related Assumptions," to calculation HNP-F/PSA-0079, Revision 1, cites "engineering judgment" as the means of translating the test results from Reference 2.7 (NUREG/CR-0381, "A Preliminary Report on Fire Protection

Research Program Fire Barriers and Fire Retardant Coatings Tests") into the delay times for ignition of solid-bottom cable trays based on fire size.

NUREG/CR-0381 lists specific tests and results for various types/configurations of fire barriers and fire retardant coatings; accordingly, please identify which of these were selected for the engineering judgment assumption cited above. In addition, if the recommended uncertainty and/or sensitivity analyses for the ignition time delay assumptions were performed, discuss the results. If the uncertainty/sensitivity analyses were not preformed, please explain why not.

HNP RAI 5-27

Item 7 of Attachment 26, "HNP Transformer Yard – Transformer Fire Impact Evaluation," to calculation HNP-F/PSA-0079, Revision 1, states, in part, that iso-phase bus and non-segregated bus are used to connect the transformers to the main generator, switchgear, and control circuitry as necessary to support the design functions of the transformers.

Please discuss whether or not the possibility of a HEAF originating in either of these two types of bus was considered. If so, provide a summary of the impact/results of this consideration, and if not, explain why the possibility of a HEAF was not considered.

HNP RAI 5-28

In Section 3.3.1, "Inputs," of calculation HNP-F/PSA-0071, "Harris Fire PRA – Fire Ignition Frequency Calculation," Revision 2, it appears that for bus duct fires, HNP has not incorporated the potential ignition sources and their associated frequencies listed into the Fire PRA.

Although not yet closed out when HNP-F/PSA-0071, Revision 2, was written, NFPA 805 FAQ 07-0035, "Bus Duct Counting Guidance for High Energy Arcing Faults," reached a consensus on ignition frequencies for bus duct fires.

Given that it appears HNP has not yet incorporated these consensus values for ignition frequencies of bus duct fires, please discuss how the licensee has assured that the potential effect from bus duct fires does not significantly impact the results from the current Fire PRA.

HNP RAI 5-29

Table 15.1, "Amended Summary of Assumptions and Sources of Uncertainty in the HNP Fire PRA," of Attachment 15, "Identification of Sensitivity Analyses for HNP NFPA 805 Change Evaluations," to calculation HNP-F/PSA-0081, Revision 1, includes assumptions 15, 16, 17, 18, 19, 21, 22, 23 and 26 regarding HRR, severity factors, the fire risk model, and plant partitioning.

These assumptions provide statements as follows:

1. In Assumption 15, the need for a specific sensitivity analysis (per the "Basis for Including or Excluding Issue as a Key Issue" field) is dismissed based on the argument given as the basis for Assumption 14.

2. In Assumptions 16, 17, 18, 19, 21, 22, and 23, there is a statement that the potential conservatisms are not expected to have masking effects.

3. In Assumption 26, it is stated that there are "significant uncertainties" associated with the Plant Boundary Definition and Partitioning element.

For Item 1, Assumption 14 addresses an uncertainty generic to NUREG/CR-6850, while Assumption 15 addresses a HNP plant-specific potential uncertainty. Accordingly, please provide the basis for dismissing a sensitivity analysis for Assumption 15 (other than the current reference to Assumption 14).

For Item 2, please provide the basis for the conclusion that no masking effects would be expected from the conservatisms outlined in the assumptions.

For Item 3, please provide the basis as to why there would be "significant uncertainties" associated with the Plant Boundary Definition and Partitioning element when HNP partitioning includes only a "few large fire compartments."

HNP RAI 5-30

In Table 15.1 of Attachment 15 to calculation HNP-F/PSA-0081, Revision 1, assumptions 27 and 28, regarding the fire risk model, include the statement that these issues were "not reviewed in detail in the present calculation" as part of the basis for concluding that they are "not risk significant." However, in general, this is an insufficient level of detail for the NRC staff to adequately assess these assumptions. Accordingly, please provide a more detailed justification for concluding that Assumption 27 and Assumption 28 are not risk significant.

HNP RAI 5-31

Table 15.1 of Attachment 15 to calculation HNP-F/PSA-0081, Revision 1, includes assumptions 30, 31, and 32 regarding the fire risk model and cable selection.

These assumptions provide statements as follows:

1. In Assumption 30 and Assumption 32, there is a statement that the potential conservatisms are not expected to have masking effects.

2. In Assumption 31 there appears to be a connection between cable damage and pressure or thermally induced steam generator tube ruptures that results in no expectation of a risk impact.

For Item 1, please provide the basis for the conclusion that no masking effects would be expected from the conservatisms outlined in the assumptions.

For Item 2, please provide a basis/justification for the conclusion of no expected risk impact.

HNP RAI 5-32

Section 3.3.5.1, "Sensitivity Issue 4: Closed MCCs Do Not Produce Arcing Faults of Sufficient Energy to Open the MCC Cabinet Doors," of Attachment 16, "Impact Assessment of Key Sensitivity Issues," to calculation HNP-F/PSA-0081, Revision 1, implies that the sensitivity calculation that is performed only examines "one direction" (e.g., the difference between an

unvarying case with and without VFDs). Specifically, for both the Nominal and Alternate Model for MCC arcing faults, only the difference with and without VFDs is examined.

Accordingly, please provide the "increased MCC ZOI" for the Alternate Model when damage outside the MCC cabinet is assumed to occur.

In addition, estimate the difference between the Alternate and Nominal Models as the "second direction" sensitivity is more important than the "first direction" to the post-transition fire CDF for the case with VFDs (i.e., 1.42E-5 per reactor year for the deterministically compliant case).

HNP RAI 5-33

Section 3.3.5.2, "Sensitivity Issue 7: Incipient Fire Detection in Low Voltage Cabinets," of Attachment 16 to calculation HNP-F/PSA-0081, Revision 1, implies that the sensitivity calculation that is performed only examines "one direction;" specifically, the difference between an unvarying case with and without VFDs for three fire models based on IFDS unavailability.

Please provide a discussion of sensitivities in the "second direction," which could show that the variation in assumed IFDS reliability has a significant effect upon the fire CDF, as the "second direction" sensitivity is more important than the "first direction" to the post-transition fire CDF. This includes the sensitivity to any assumed delay time (e.g., 30 to 60 minutes) for this "second direction." (Note that Appendix P, "Detection and Suppression Analysis," of NUREG/CR-6850, indicates that a 30 minute delay in manual suppression could significantly impact the non-suppression probability depending upon the category of fire that is assumed.)

HNP RAI 5-34

Section 3.3.5.4, "Sensitivity Issue 13: Fire Brigade Response Time," of Attachment 16 to calculation HNP-F/PSA-0081, Revision 1, implies that the sensitivity calculation that is performed only examines "one direction;" specifically, the difference between an unvarying case with and without VFDs for two fire models based on 50 percent and 100 percent fire brigade response time given the nominal overall expected drill response time.

Please provide a discussion of sensitivities in the "second direction," which could show that the variation in assumed fire brigade response time has a non-negligible effect upon the fire CDF, as the "second direction" sensitivity is more important than the "first direction" to the post-transition fire CDF.

HNP RAI 5-35

Section 4.6.2, "Overview of Post-Transition NFPA 805 Monitoring Program," of the Harris Transition Report, states that "another aspect of risk criteria is establishing performance criteria. These performance criteria will be established for items within the NFPA 805 monitoring scope, regardless of their ability to be measured using risk significant criteria."

It appears that the second part of the statement contradicts the first; namely, that "risk performance criteria" will be developed even for items that do not have the ability to be measured against risk significant criteria. Please correct this apparently incongruous statement, or discuss why there is no contradiction.

HNP RAI 5-36

In Attachment X of the Harris Transition Report, the disposition for findings and observations (F&O) FSS-E3-1 states that "the uncertainty intervals for the estimated mean values for the ignition frequencies, heat release rates, and severity factors are from NUREG/CR-6850. The range of uncertainties for the human failure probabilities were determined using the same process used for the model of record human failure probabilities."

Please discuss how these uncertainty values were incorporated into the fire risk quantification.

HNP RAI 5-37

In Attachment X of the Harris Transition Report, the dispositions for F&Os FQ-F1-1, FQ-A4-02, FQ-D1-01, and FQ-F1-01 state that certain required elements have not been completed due to software limitations, and include some version of the following statement:

> The sensitivity and uncertainty of CDF and LERF are driven mostly by two factors much more important than the data uncertainty as discussed in the Harris Fire PRA Uncertainty analysis, these fire uncertainties are: 1) the Fire Frequency of the generic data is a direct multiplicative effect on CDF and LERF; and 2) the fire growth, severity factors, heat release rates, and the associated non-suppression probability. Thus the lack of a quantitative uncertainty distribution does not impact the quality of the Harris Fire PRA.

While the last statement may be accurate for the base HNP Fire PRA being used during the NFPA 805 transition, it may not be sustainable for post-transition applications that intend to employ the "going forward" Fire PRA. Accordingly, please provide a discussion of how HNP will account for this lack of an uncertainty distribution when applying the Fire PRA to post-transition applications (i.e., how will the uncertainties in fire frequency, fire growth, severity factors, HRRs, and associated non-suppression probabilities be treated).

HNP RAI 5-38

Section Y.1.1, "Important Fire Compartments," of Attachment Y, "NFPA 805 Transition Risk Insights," to the Harris Transition Report, states that for FC54, Transformer Yard, "the transformer yard contains the main output transformers."

Please clarify whether or not there are scenarios involving concurrent fire-induced loss of multiple transformers. In addition, discuss what this would contribute to the CDF and LERF for FC54. (Note that reference to Attachment 2, "Source Results," of calculation HNP-F/PSA-0079 seems to indicate that concurrent, multiple transformer losses were not considered.)

HNP RAI 5-39

Section Y.1.1 of Attachment Y to the Harris Transition Report, states that for FC03, PIC Cabinet Room, "the incipient detection system significantly reduces the potential for HGL and the resulting risk is due to the number of important cabinets in this room ... Fire modeling has been performed within the PIC room to summarize the minimum fire size capable of damaging sensitive equipment. This information was applied by crediting solid bottom cable trays and

adjusting the severity factor of several large fires. Because of the large amount of vital equipment in 12-A-CRC1, a modification to install incipient detection in higher risk or HGL potential cabinets has been credited in this section."

Please clarify whether or not the solid bottom cable trays are already present in this compartment, or if they are a planned modification. In addition, provide a discussion of how the solid bottoms to the cable trays are modeled and credited, and how sensitive the analysis results are to these credits. Finally, please describe any "fire modeling" that has been performed within the PIC room.

HNP RAI 5-40

In Table Y-3, "Fire Sources for CDF by Importance," of Attachment Y to the Harris Transition Report, HGL contributes to CDF for only a few fire sources. However, Table Y-4, "Fire Sources for LERF by Importance," HGL contributes to LERF for most of the fire sources.

Please explain why there is such a difference in HGL contribution for these two tables.

6. Please provide the following information concerning the NFPA 805 monitoring program:

HNP RAI 6-1

NFPA 805, Section 2.6, "Monitoring," requires licensees to establish and monitor acceptable levels of availability, reliability, and performance for the fire protection systems and features. However, the material submitted regarding HNP's monitoring program, located in Section 4.6, "Monitoring Program," of the Harris Transition Report, contains insufficient detail for the NRC staff to properly evaluate this issue.

Please provide a detailed description of the monitoring program that will be used to assess acceptable levels of availability, reliability, and performance for the fire protection systems and features at HNP. The scope of the response should include an example or examples that demonstrate the process, as well as a schedule for completion of the monitoring program.

The examples and discussion for the HNP monitoring program should:

1. Describe how HNP will identify the appropriate fire protection systems and features, and the attributes of those systems and features, which will be monitored.

2. Clarify what criteria will be used to assess acceptable levels of availability, reliability, and performance for each system/feature/attribute.

3. Clarify what method(s) will be used to monitor the availability, reliability, and performance of each system/feature/attribute.

4. Explain how unacceptable levels of availability, reliability, and performance for each system/feature/attribute will be managed.

Please note that the NRC staff found, during the onsite regulatory audit at HNP, that the information contained in HNP transition procedure FPIP-0130, "NFPA 805 Monitoring," is at the appropriate level of detail to address this issue.

Section 4.6 of the Harris Transition Report indicates that the HNP monitoring program is currently under development and will be implemented as part of the fire protection program transition to NFPA 805. The NRC staff recognizes that the monitoring program is not required to be completed prior to the issuance of an SE approving the use of NFPA 805. However, the NRC staff should have the ability to review the process by which the monitoring program is being developed in order to ensure compliance with the related NFPA 805 requirements.

7. Please provide the following information concerning program documentation, configuration control, and quality assurance:

HNP RAI 7-1

NFPA 805, Section 2.7.2.1, "Design Basis Document," discusses maintenance and control of the design basis document. However, as indicated in NEI 04-02, Section 5.1.1.1, "Program Documentation," NFPA 805 does not address the difference between the design basis document and the licensing basis document. Therefore, it is incumbent on HNP to clearly define what constitutes the licensing basis document. Accordingly, please:

a. Provide a description of the process by which program documentation and configuration control will be maintained during the NFPA 805 transition process, as well as carried forward post transition.

b. Discuss the procedure/process that enures configuration management and quality assurance during the NFPA 805 transition period.

c. Describe the process/procedure by which the licensing basis documentation will be managed post transition.

d. Describe how this process/procedure differs from the existing plant procedures for controlling licensing basis documentation.

e. Figure 4-8, "NFPA 805 Transition – Planned Post-Transition Documentation Relationships," of the Harris Transition Report, provides a flow diagram that shows relationships between various analyses and post transition documents. Identify specifically those documents that constitute the licensing basis for HNP post transition.

HNP RAI 7-2

The fire protection program manual is one of the principal documents governing the manner in which the fire protection program is implemented at HNP. Accordingly, please identify any changes that will be made to FPP-01, "Fire Protection Program Manual," as a part of the NFPA 805 transition process. In addition, describe the type of training that will be provided and identify the required recipients of the training necessary for this program change.

HNP RAI 7-3

NEI 04-02, Appendix C, "Fire Protection Program Design / Licensing Document Post Transition," states that "the existing FP Quality program should be transitioned as-is into the new NFPA 805 FP Program." Please describe any changes being made to the Fire Protection Quality Assurance Program at HNP as a part of the NFPA 805 transition process.

HNP RAI 7-4

The requirement to perform periodic assessments (audits) of the fire protection program currently resides within HNP's existing fire protection licensing basis. Please clarify whether or not this requirement will be carried over into the NFPA 805 licensing basis. If yes, discuss where in the NFPA 805 program documentation it will reside. If no, provide a justification for deleting this requirement. In addition, please discuss how the existing fire protection program audit requirements differ from those required to meet NFPA 805, Section 3.2.3(3), regarding procedures for reviews of fire protection program-related performance and trends.

The remaining longer term requests will require responses based on the schedule previously established between the NRC staff and the licensee. Please contact me at 301-415-3178 if you have any questions on this issue, would like to participate in a conference call, or if you require additional time to submit any of your responses.

Sincerely,

/RA/

Marlayna Vaaler, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure: As stated

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