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May 30, 2008

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Site Units 1, 2, and 3
Docket Numbers 50-269, 50-270 and 50-287
License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 Edition).
License Amendment Request (LAR) No. 2008-01

In accordance with 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke) proposes to amend Renewed Facility Operating Licenses (FOLs) Nos. DPR-38, DPR-47, and DPR-55. This LAR requests Nuclear Regulatory Commission (NRC) review and approval for adoption of a new fire protection licensing basis which complies with the requirements in 10 CFR 50.48(a), 10 CFR 50.48(c), and the guidance in Regulatory Guide (RG) 1.205. The LAR follows Nuclear Energy Institute (NEI) 04-02. The license amendment request will be submitted in two parts. This submittal describes the methodology used for the transition, compliance with National Fire Protection Association (NFPA) 805, Regulatory Evaluations, and supporting attachments. The supplement to this submittal will address probabilistic risk assessment (PRA), change evaluations, and proposed modifications for non-compliances. A project milestone schedule for the supplement to the LAR will be submitted by June 30, 2008.

Since 2005, Oconee Nuclear Site (ONS) has participated as one of two "pilot plants" in developing an industry process for transitioning the license basis for fire protection from a deterministic license basis per 10 CFR 50.48(b) and (a) to a risk-informed, performance-based (RI-PB) license basis per 10 CFR 50.48(c) and (a).

The transition includes the following high level activities: a new fire safe shutdown analysis; a new fire PRA; and completion of activities required to transition the licensing basis to 10 CFR 50.48(c).

A006

NRR

A series of reviews and observation meetings occurred as part of the Pilot Plant process. These served to increase communication between the NRC and transitioning licensees, develop transition lesson learned reports from observation visits, improve the NFPA 805 Regulatory Guide and Inspection Procedures, gain insights on the Enforcement Discretion Policy, and develop a LAR template.

In addition to the Pilot Plant Process, NEI established the NFPA 805 Task Force, to ensure successful implementation of RG 1.205. The NFPA 805 Task force provided the interface between the pilot plants, the nuclear industry, and the NRC.

The NFPA 805 Task Force, working with the NRC, developed the Frequently Asked Questions (FAQ) process for obtaining clarifications to Regulatory Guide (RG) 1.205, NEI 04-02, and NFPA 805. It is discussed in Enclosure 2, section 3.4. Attachment H of Enclosure 2 provides the FAQs to date that have been used to clarify the guidance documents listed above. FAQ is an ongoing process that will continue through the transition of non-pilot plants. It is expected that additional FAQs will be written and existing FAQs will be revised as the pilot and non-pilot efforts continue.

Also, as part of the "pilot" process, the NRC conducted a review of the Unit 3 fire PRA model, March 17-21, 2008. The review allowed the NRC to assess the technical adequacy of the base Fire PRA model. Although not a peer review, it was conducted in accordance with peer review guidelines outlined in the PRA Standard to the extent practicable. Preliminary results of the review were issued in a report dated April 10, 2008 (ADAMS Accession No. ML080940639). As of the date of this submittal the final report is pending.

Enclosure 2 contains the ONS Transition Report (TR) and its supporting attachments. The TR provides the required technical and regulatory assessments to enable the NRC to begin the review and approval of the new licensing basis. Duke considers Attachment C of Enclosure 2 to be sensitive information and requests that it be withheld from public disclosure pursuant to 10 CFR 2.390.

The Fire PRA for all ONS Units to support the RI-PB change evaluations per Regulatory Positions C.2.2 and C.4.3 of Regulatory Guide (RG) 1.205 has not been completed. Therefore, Fire PRA results, treatment of operator manual actions (OMAs) and the associated change evaluations have not been completed. The following is a list of LAR sections that are expected to require revision and be included in the supplement to the LAR:

- Executive Summary (revision)
- Section 4.5.3 – Change Evaluation results and Table 4-5 (revision)
- Section 5.4 – Transition Implementation Schedule
- Attachment C – Fire Area Transition (revision)
- Attachment D – NPO Modes Transition evaluation (components and fire area assessment)
- Attachment F – MSO discussion (revision)

- Attachment G – OMA discussion
- Attachment R – Example UFSAR change
- Attachment S – Plant Modifications descriptions

Enclosures 3 and 4 contain the marked up and retyped pages for the FOLs, Technical Specifications, and Technical Specification Bases, respectively.

Enclosure 5 contains a summary of open items for all three Units. The majority of these items result from the Enclosure 2, Section 4, NFPA 805 Compliance reviews. Many of these issues repeat for multiple fire areas. Approximately 450 Open Items are listed with a reference to where in the TR the details for each item are described. The list of open items in general include: 1) variances from the deterministic requirements of NFPA 805 for which RI-PB change evaluations will be performed, 2) additional analyses required in support of the transition reviews, and 3) implementation activities for NFPA 805. Duke considers Enclosure 5 to be sensitive information and requests that it be withheld from public disclosure pursuant to 10 CFR 2.390.

Enclosure 6 contains a commitment to provide a project milestone schedule for the following activities by June 30, 2008:

- The MSO treatment, Change Evaluations and the determination of the additional risk presented by the use of recovery actions as a compliance strategy.
- The Unit 1 Fire PRA screening analysis.
- The Unit 2 Fire PRA.
- The modifications necessary to support the new LB.
- An UFSAR example.
- The NPO Modes transition evaluation.
- A schedule for the completion of the transition to the new fire protection LB

The pilot plant process is ongoing and will continue following submittal of this LAR via closure of pending FAQs and NRC requests for additional information (RAIs). Duke agrees that significant benefits are to be gained, not only by ONS, but the non-pilot plants, for the NRC to begin its review of this submittal, while the change evaluations are completed, necessary modifications identified, and the open items described in Enclosure 5 are completed.

As the transition continues, other issues that affect the information in this submittal may be discovered. These items will be discussed in the supplement to the LAR.

Duke will provide a final update to the Oconee UFSAR per 10 CFR 50.71(e).

In accordance with Duke administrative procedures and the Duke Quality Assurance Program Topical Report, these proposed changes have been reviewed by the Plant Operations Review Committee and Nuclear Safety Review Board. Additionally, a copy of this LAR is being sent to the State of South Carolina in accordance with 10 CFR 50.91 requirements.

Please refer any questions regarding this submittal to Reene' Gambrell at (864) 885-3364.

Sincerely,

R. A. Jones, Senior Vice President, Nuclear Operations
Duke Energy Carolinas, LLC

Enclosures:
1. Notarized Affidavit
2. Transition Report
3. Facility Operating License, Technical Specifications, and Technical Specifications Bases - Markup
4. Facility Operating License, Technical Specifications, and Technical Specifications Bases - Retype
5. Open Item Summary
6. List of Regulatory Commitments

Attachment C of Enclosure 2 and Enclosure 5 contains sensitive information
Withhold under 10 CFR 2.390.

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Attachment 3 of Enclosure 2 and Enclosure 5 contains sensitive information
Withhold under 10 CFR 2.390.

ENCLOSURE 1

NOTARIZED AFFIDAVIT

AFFIDAVIT

R. A. Jones, being duly sworn, states that he is Senior Vice President, Nuclear Operations, Duke Energy Carolinas, LLC that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this revision to the Renewed Facility Operating License Nos. DPR-38, DPR-47, and DPR-55; and that all statements and matters set forth herein are true and correct to the best of his knowledge.

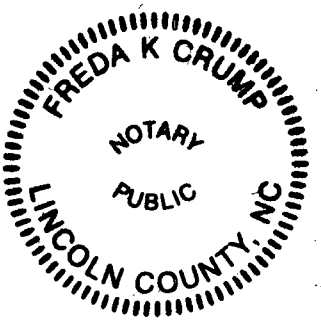
R. A. Jones, Senior Vice President, Nuclear Operations
Duke Energy Carolinas, LLC

Subscribed and sworn to before me this 30 day of May, 2008

Freda K. Crump
Notary Public

My Commission Expires:

August 17, 2011
Date



SEAL

ENCLOSURE 2

TRANSITION REPORT

Duke Energy Carolinas, LLC
Oconee Nuclear Station Units 1, 2, and 3
Docket 50-269, 50-270 and 50-287

Transition to 10 CFR 50.48(c) - NFPA 805
Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition

Transition Report

Revision 0

May 30, 2008

TABLE OF CONTENTS

List of Acronyms iv

Executive Summary vii

1.0 INTRODUCTION 1

1.1 Background 1

1.1.1 NFPA 805 – Requirements and Guidance 1

1.1.2 ONS Transition to 10 CFR 50.48(c) 2

1.2 Purpose 4

2.0 OVERVIEW OF EXISTING FIRE PROTECTION PROGRAM 5

3.0 TRANSITION PROCESS 6

3.1 Background 6

3.2 NFPA 805 Process 6

3.3 NEI 04-02 – NFPA 805 Transition Process 7

3.4 NEI 04-02 Frequently Asked Questions (FAQs) 9

4.0 COMPLIANCE WITH NFPA 805 REQUIREMENTS 11

4.1 Fundamental Fire Protection Program and Design Elements 11

4.1.1 Overview of Evaluation Process 11

4.1.2 Results of the Evaluation Process 14

4.1.3 Definition of Power Block and Plant 14

4.2 Nuclear Safety Performance Criteria Transition Review 14

4.2.1 Nuclear Safety Capability Assessment Methodology Review 15

4.2.2 Fire Area-by-Fire Area Transition 17

4.3 Non-Power Operational Modes 21

4.3.1 Overview of Evaluation Process 21

4.3.2 Results of the Evaluation Process 27

4.4 Radioactive Release Performance Criteria 28

4.4.1 Overview of Evaluation Process 28

4.4.2 Results of the Evaluation Process 28

4.5 Change Evaluations 29

4.5.1 Fire PRA Development and Acceptance 29

4.5.2 NFPA 805 Risk-Informed, Performance-Based Change Evaluation Process 35

4.5.3 NFPA 805 Risk-Informed, Performance-Based Change Evaluation Results 37

4.5.4 Risk Change Due to NFPA 805 Transition 37

4.6 Monitoring Program 37

4.6.1 Overview of NFPA 805 Requirements and NEI 04-02 Guidance on the Existing Monitoring Program 37
4.6.2 Overview of Post-Transition NFPA 805 Monitoring Program 38
4.7 Program Documentation, Configuration Control, and Quality Assurance 40
4.7.1 Compliance with Documentation Requirements in Section 2.7.1 of NFPA 805 40
4.7.2 Compliance with Configuration Control Requirements in Section 2.7.2 of NFPA 805 40
4.7.3 Compliance with Quality Requirements in Section 2.7.3 of NFPA 805 40
4.8 Summary of Results 41
4.8.1 Results of the Fire Area-by-Fire Area Review 41
4.8.2 Supplemental Information – Generic Issue Resolution 44
4.8.3 Plant Modifications 44
5.0 REGULATORY EVALUATION 45
5.1 Introduction – 10 CFR 50.48 45
5.2 Regulatory Topics 50
5.2.1 License Condition Changes 50
5.2.2 Technical Specifications 50
5.2.3 Orders and Exemptions 50
5.3 Regulatory Evaluations 51
5.3.1 No Significant Hazards Consideration 51
5.3.2 Environmental Consideration 53
5.4 Supplemental LAR Submittal 54
Attachments 56
A. NEI 04-02 Table B-1 Transition of Fundamental FP Program & Design Elements A-1
B. NEI 04-02 Table B-2 – Nuclear Safety Capability Assessment - Methodology Review B-1
C. NEI 04-02 Table B-3 – Fire Area Transition C-1
D. NEI 04-02 Table F-1 Non-Power Operational Modes Transition D-1
E. NEI 04-02 Table G-1 Radioactive Release Transition E-1
F. Fire-Induced Multiple Spurious Operations Resolution F-1
G. Operator Manual Actions Transition G-1
H. NEI 04-02 Frequently Asked Question Summary Table H-1
I. Definition of Power Block I-1
J. EEEE Transition J-1
K. Existing Licensing Action Transition K-1
L. NFPA 805 Chapter 3 Requirements for Approval L-1

M. License Condition Changes M-1
N. Technical Specification Changes N-1
O. Orders and Exemptions O-1
P. Performance-Based Methods 10 CFR 50.48(c)(2)(vii) P-1
Q. RI-PB Alternatives to NFPA 805 10 CFR 50.48(c)(4) Q-1
R. UFSAR Changes R-1
S. Plant Modifications S-1
T. Clarification of Prior NRC Approvals T-1

List of Acronyms

Acronym	Description
ADAMS	Agencywide Document Access and Management System
AHJ	Authority Having Jurisdiction
ANS	American Nuclear Society
ANSI	American National Standards Institute
AOP	Abnormal Operating Procedure
APCSB	Auxiliary Power Conversion Systems Branch
ASME	American Society of Mechanical Engineers
BTP	Branch Technical Position
B&WOG	B&W Owners Group
BWR	Boiling Water Reactor
CCW	Condenser Circulating Water
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CLB	Current Licensing Basis
CNS	Catawba Nuclear Station
CSD	Cold Shutdown
DB	Design Basis
DBA	Design Basis Accident
DBD	Design Basis Document
DID	Defense-In-Depth
Duke	Duke Energy Carolinas, LLC
EEE	Engineering Equivalency Evaluation
EEEE	Existing Engineering Equivalency Evaluation
EOP	Emergency Operating Procedure
EPRI	Electric Power Research Institute
ERFBS	Electrical Raceway Fire Barrier Systems
FAQ	Frequently Asked Question
FM	Factory Mutual
F&O	Facts and Observations
FP	Fire Protection
FPE	Fire Protection Engineer
FPIE	Full Power Internal Events
FPP	Fire Protection Program
FPRA	Fire Probabilistic Risk Assessment
FR	Federal Register
FSA	Fire Safety Analysis

Acronym	Description
GDC	General Design Criteria
GL	Generic Letter
HEP	Human Error Probability
HGL	Hot Gas Layer
HRE	Higher Risk Evolution
HRR	Heat Release Rate
HVAC	Heating Ventilation and Air Conditioning
IEEE	Institute of Electrical and Electronic Engineers
IM	Inspection Manual
IN	NRC Information Notice
ISLOCA	Inter-system LOCA
KSF	Key Safety Function
LAR	License Amendment Request
LB	Licensing Basis
LERF	Large Early Release Frequency
LOCA	Loss of Coolant Accident
LPG	Liquid Petroleum Gas
MAPP	DOW trade name for LPG mixed with Methylacetylene-Propadiene
MCA	Multicompartment Analysis
MCB	Main Control Board
MHIF	Multiple High Impedance Fault
MNS	McGuire Nuclear Station
MSO	Multiple Spurious Operation
NARA	National Archives and Records Administration
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NPO	Non-Power Operations
NRC	Nuclear Regulatory Commission
NSCA	Nuclear Safety Capability Assessment
NSD	Nuclear System Directive
NSHC	No Significant Hazards Consideration
NUMARC	Nuclear Management and Resource Council
OMA	Operator Manual Action
ONS	Oconee Nuclear Station
OOS	Out of Service
PDF	Portable Document Format
PORV	Power-operated relief valve
POS	Plant Operational State

Acronym	Description
PRA	Probabilistic Risk Assessment
PSA	Probabilistic Safety Assessment
PVC	Polyvinyl Chloride
PWR	Pressurized Water Reactor
PWROG	Pressurized Water Reactor Owners Group
QA	Quality Assurance
RCA	Radiological Control Area
RCS	Reactor Coolant System
RCZ	Radiological Control Zone
RG	Regulatory Guide
RHR	Residual Heat Removal
RIA	Radiation Indicating Alarm
RI-PB	Risk-Informed – Performance-Based
RIS	Regulatory Issue Summary
RP	Radiation Protection
SER	Safety Evaluation Report
SFPE	Society of Fire Protection Engineers
SG	Steam Generator
SOG	Standard Operating Guideline
SPA	Single Point of Access
SSA	Safe Shutdown Analysis
SSC	Structures, Systems, and Components
SSD	Safe Shutdown
SSE	Safe Shutdown Earthquake
SSEL	Safe Shutdown Equipment List
TB	Turbine Building
TBD	To Be Determined
TH	Thermal Hydraulic
TR	Transition Report
UFSAR	Updated Final Safety Analysis Report

Executive Summary

Duke will transition the ONS FPP and LB to a new RI-PB alternative per 10 CFR 50.48(c) which endorses NFPA 805. The CLB per 10 CFR 50.48(b) and 10 CFR 50, Appendix R, which has been in place since the early 1980's will be superseded.

In 2005, Duke volunteered to serve as one of the two Pilot Plants that would work with the NEI and the NRC in developing a transition process. Guidance document, NEI 04-02 was developed as a standard process to simplify preparation of LARs, as well as to simplify NRC review. Currently more than 40 units have committed to transition to the new regulation.

Transition Report Structure

The following is a summary of the major elements of this report and where the information is contained:

Section 4 of the TR and associated attachments provide a summary of compliance with NFPA 805 requirements which addresses the following major topics:

- Fundamental Fire Protection Program and Minimum Design Requirements (Attachment A)
- Nuclear Safety Performance Criteria Transition Review (Attachments B and C)
- Non-Power Operational Modes (Attachment D)
- Radioactive Release Performance Criteria (Attachment E)
- Fire PRA Development and Change Evaluations
- Monitoring Program
- Program Documentation, Configuration Control, and Quality Assurance

Section 5 of the TR and associated attachments provide regulatory evaluations for:

- Changes to License Conditions (Attachment M)
- Changes to Technical Specifications, Orders, and Exemptions (Attachments N and O)
- Determination of No Significant Hazards Consideration
- Evaluation of Environmental Considerations

Attachment T includes topics in the CLB issues for which clarification of previous approval is requested.

It should be noted that the TR assumes NRC acceptance of certain FAQs pending approval listed in Table H-1 of Attachment H and it is requested that approval be provided as part of the SER for this TR.

Open Item Summary (Enclosure 5 of the LAR)

Enclosure 5 provides an overall summary of the open items contained in the various tables and sections of this TR. The majority of these items result from the Chapter 4 reviews. These issues repeat across multiple fire areas and include all three Units. A total of approximately 450 Open Items are summarized in Enclosure 5 with a reference to where in the TR the details for each item are described. The summary of open items in general includes: 1) items which are variances from the deterministic requirements of NFPA 805 for which change evaluations will be performed, 2) additional analyses required in support of the transition reviews, and 3) implementation activities required following receipt of an SER.

Fire PRA Status:

The NRC Fire PRA Review of the ONS Fire PRA required by RG 1.205 was conducted March 17-21, 2008. The NRC issued preliminary results on April 10, 2008 (ML080940639). The identification and resolution of the high level findings from the NRC Fire PRA Review and Fire PRA industry peer review process are summarized in Section 4.5.1.2.

The supporting calculations for the Unit 3 Fire PRA are awaiting approval. The open items from the Fire PRA NRC review and the internal events PRA self-assessment with potential quantification implications will be addressed within the sensitivity analysis included as part of the Change Evaluations in the supplement to the LAR. A Unit 2 Fire PRA has been developed and will be completed to support the supplement to the LAR. For Unit 1, a comparative screening analysis of the Fire PRA will be performed in lieu of a unique fault tree. The Unit 1 Fire PRA screening analysis will be completed to support the supplement to the LAR.

Plant Modifications

Attachment S is intended to include a listing of any required modifications. Upon completion of the change evaluations, ONS will be in a position to determine any necessary modifications. Modifications required will be identified in the supplement to the LAR.

Updated Final Safety Analysis Report Change:

UFSAR changes necessitated by the license amendment will be submitted in accordance with 10 CFR 50.71(e). An example of the content and detail of the proposed changes to the UFSAR shall be submitted in the supplement to the LAR.

Supplemental LAR Submittal Scope/Contents

The Fire PRA for all three ONS Units to support the RI-PB Change Evaluations per Regulatory Positions C.2.2 and C.4.3 of Regulatory Guide (RG) 1.205 has not been completed. Therefore, Fire PRA results, treatment of OMAs and the associated Change Evaluations have not been completed. The following is a list of the sections of the LAR that are expected to require revision and be included in the in the supplement to the LAR.

- Executive Summary (revision)
- Section 4.5.3 – Change Evaluation results and Table 4-5 (revision)
- Section 5.4 – Transition Implementation Schedule
- Attachment C – Fire Area Transition (revision)
- Attachment D – NPO Modes Transition evaluation (components and fire area assessment)
- Attachment F – MSO discussion (revision)
- Attachment G – OMA discussion
- Attachment R – Example UFSAR change
- Attachment S – Plant Modifications descriptions

Commitments

Enclosure 6 identifies the regulatory commitments in this document. Any other statements in this submittal represent intended or planned actions. They are provided for information purposes and are not considered to be regulatory commitments.

Provide a project milestone schedule for the following activities by June 30, 2008:

- The MSO treatment, Change Evaluations and the determination of the additional risk presented by the use of recovery actions as a compliance strategy shall be submitted.
- The Unit 1 Fire PRA screening analysis shall be performed.
- The Unit 2 Fire PRA shall be completed.
- The modifications necessary to support the new LB shall be identified.
- An UFSAR example shall be submitted.
- The NPO Modes transition evaluation shall be completed.
- A schedule for the completion of the transition to the new fire protection LB

1.0 INTRODUCTION

The NRC has promulgated an alternative rule for fire protection requirements at nuclear power plants, 10 CFR 50.48(c), NFPA 805. Duke is implementing the methodology for transitioning ONS from its current fire protection LB to the new requirements as outlined in NFPA 805. This report describes the transition methodology applied by Duke for ONS and documents how ONS will demonstrate compliance with the new requirements.

1.1 Background

1.1.1 NFPA 805 – Requirements and Guidance

On July 16, 2004 the NRC amended 10 CFR Part 50.48, Fire Protection, to add a new subsection, 10 CFR 50.48(c), which establishes new RI-PB fire protection requirements. 10 CFR 50.48(c) endorses, with exceptions, the National Fire Protection Association's NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants – 2001 Edition, as a voluntary alternative for demonstrating compliance with 10 CFR 50.48 Section (b), Appendix R, and Section (f), Decommissioning.

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

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

A depiction of the primary document relationships is shown in Figure 1-1:

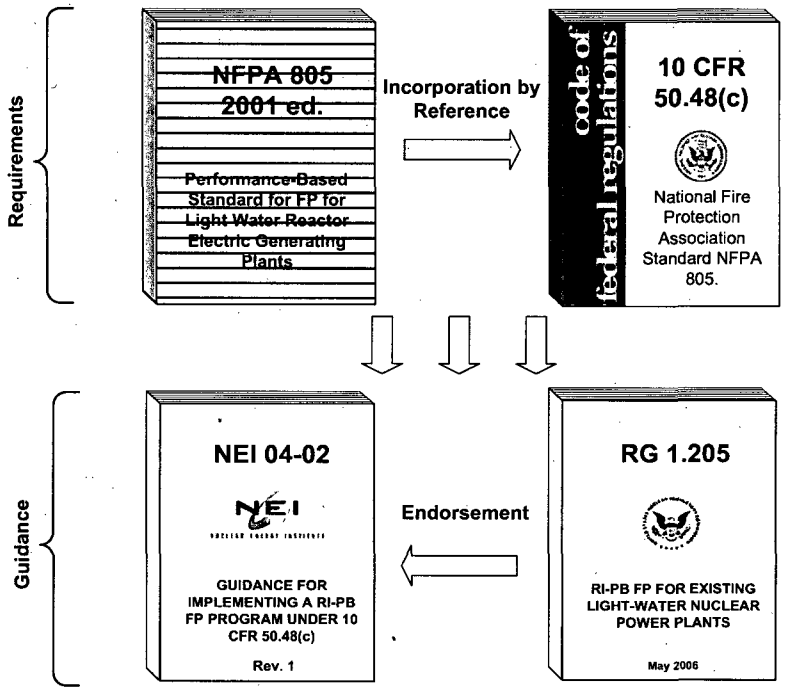


Figure 1-1 NFPA 805 Transition – Implementation Requirements/Guidance

1.1.2 ONS Transition to 10 CFR 50.48(c)

1.1.2.1 Start of Transition

In 2005, ONS decided to transition the fire protection licensing basis to the RI-PB alternative in 10 CFR 50.48(c). Duke submitted a letter of intent to the NRC on February 28, 2005 (ML050670305) for ONS to adopt NFPA 805 in accordance with 10 CFR 50.48(c). The letter of intent also proposed that ONS be considered a Pilot Plant for the NFPA 805 transition process.

By letter dated June 8, 2005 (ML051080005), the NRC agreed ONS should be an NFPA 805 Transition Pilot Plant and granted a two year enforcement discretion period for existing identified items. In a letter dated April 30, 2007, (ML071280287), Duke requested an extension of the period of enforcement discretion for unresolved items from 2 years to 3 years for ONS. The NRC granted a third year of enforcement discretion by letter dated June 1, 2007 (ML071310402) extending the ONS LAR submittal date to May 31, 2008. In accordance with NRC Enforcement Policy, the enforcement discretion period will continue until the NRC approval of the license amendment request is completed.

1.1.2.2 ONS Transition Process

The ONS NFPA 805 transition is being conducted as part of a fleet initiative. The initiative includes the following high level activities:

- A new fire safe shutdown analysis (continuation of activities started in 2000 for 10 CFR 50, Appendix R)

- A new Fire PRA using NUREG/CR 6850, EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities, as guidance and a revision to the Internal Events PRAs to support the Fire PRAs
- Completion of activities required to transition the LB to 10 CFR 50.48(c) as specified in NEI 04-02

1.1.2.3 NFPA 805 Pilot Plant Summary

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

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

A summary of the major Pilot Plant activities are shown in Table 1-1:

Table 1-1 NFPA 805 Pilot Observation Meeting Summary

Date	Location	Summary
11/7/05-11/11/05	Charlotte, NC	Pilot Observation Meeting [ML060250033, ML060250034]
3/27/06—3/30/06	Raleigh, NC	Pilot Observation Meeting [ML061500468, ML061520285]
10/16/06-10/19/06	Seneca, SC ONS	Pilot Observation Meeting [ML070280007, ML070320285]
11/6/06-11/8/06	Raleigh, NC	Pilot Observation Meeting [ML063330521, ML070820251, ML063310386, ML071210207, ML071060267]
3/6/07-3/8/07	Raleigh, NC	Pilot Observation Meeting [ML070950030, ML070960489, ML071160447]
5/30/07-6/1/07	Raleigh/Apex, NC	Pilot Observation Meeting/Public Meeting [ML071930362, ML071930339]
7/10/07-7/13/07	Seneca, SC ONS	Pilot Observation Meeting/Public Meeting [ML072270014, ML072610448, ML072610455, ML072140380]
8/6/07-8/9/07	Bethesda, MD	Pilot Observation Meeting/Public Meeting [ML072830064, ML072890127, ML072910745]
11/5/07-11/8/07	Atlanta, GA NRC Region II Offices	Pilot Observation Meeting/Public Meeting [ML073321171, ML073270905]
12/7/07	Rockville, MD NRC Headquarters	Pilot Observation Meeting/Public Meeting – FAQ 07-0040, Non-Power Operations [ML073241052]

Table 1-1 NFPA 805 Pilot Observation Meeting Summary

Date	Location	Summary
12/12/07	Washington, DC NEI Headquarters	Pilot Observation Meeting/Public Meeting – Fire PRA Human Reliability Analysis (HRA) and Operator Manual Action Reconciliation [ML073371166]
1/7/08-1/8/08	Raleigh, NC	Pilot Observation Meeting/Public Meeting ; Review of LAR/Transition Report detail. [ML080450128, ML080450058]
4/15/08-4/16/08	Charlotte, NC	Pilot Observation Meeting/Public Meeting ; Review of LAR/Transition Report detail, UFSAR, MSO and OMA resolution. [ADAMS Reference Pending]

In addition to the Pilot Plant Observation Meetings, NEI established an NFPA 805 Task Force, to ensure the successful implementation of RG 1.205 (NEI 04-02). The Task Force provides support to plants transitioning to RI-PB regulatory framework per 10 CFR 50.48(c). This includes support for the resolution of issues that may surface during the Pilot Plant process. The Task Force holds monthly meetings to communicate status of Pilot Plant activities, provide examples of Pilot Plant transition products, and to provide non-pilot plants a forum to resolve/discuss technical issues.

1.2 Purpose

The purpose of the ONS TR is as follows:

1) Describe the process implemented by Duke to transition the ONS fire protection program to compliance with the requirements in 10 CFR 50.48(c);
2) Summarize the results to date of the ONS transition process;
3) Explain the bases for Duke's conclusions that the ONS fire protection program complies with 10 CFR 50.48(c) requirements (pending approval of identified NFPA 805 Chapter 3 deviations); and
4) Describe the new ONS fire protection LB.

2.0 OVERVIEW OF EXISTING FIRE PROTECTION PROGRAM

Duke ONS Renewed Facility Operating License condition 3.D for each unit states:

> *"3.D. Fire Protection Program*
>
> *Duke Energy Carolinas, LLC shall implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR for the facility and as approved in the SER's dated August 11, 1978, and April 28, 1983; October 5, 1978, and June 9, 1981 Supplements to the SER dated August 11, 1978; and Exemptions dated February 2, 1982; August 31, 1983; December 27, 1984; December 5, 1988; and August 21, 1989 subject to the following provision:*
>
> *The licensee may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire."*

In addition to the license condition and the referenced SERs, the current ONS licensing basis includes 10 CFR 50.48(a) and (b) requirements.

3.0 TRANSITION PROCESS

3.1 Background

Section 4.0 of NEI 04-02 describes the process for transitioning from compliance with the current fire protection licensing basis to the new requirements of 10 CFR 50.48(c). NEI 04-02 contains the following steps:

1) Licensee determination to transition the licensing basis and devote the necessary resources to it;
2) Submit a Letter of Intent to the NRC stating the licensee's intention to transition the licensing basis in accordance with a tentative schedule;
3) Conduct the transition process to determine the extent to which the current fire protection licensing basis supports compliance with the new requirements and the extent to which additional analyses, plant and program changes, and alternative methods and analytical approaches are needed;
4) Submit a LAR;
5) Complete transition activities that can be completed prior to the receipt of the License Amendment;
6) Receive SER; and
7) Complete implementation of the new licensing basis.

3.2 NFPA 805 Process

Section 2.2 of NFPA 805 establishes the general process for demonstrating compliance with NFPA 805. This process is illustrated in Figure 3-1. It shows that except for the fundamental fire protection requirements, compliance can be achieved on a fire area basis either by deterministic or RI-PB methods. (The NRC permits licensees to use RI-PB methods to comply with the fundamental fire protection requirements, but those applications must be approved through the NRC's license amendment process) Consistent with the guidance in NEI 04-02, ONS is implementing this process by first determining the extent to which its current fire protection program supports findings of deterministic compliance with the requirements in NFPA 805. RI-PB methods are being applied to the requirements for which deterministic compliance could not be shown.

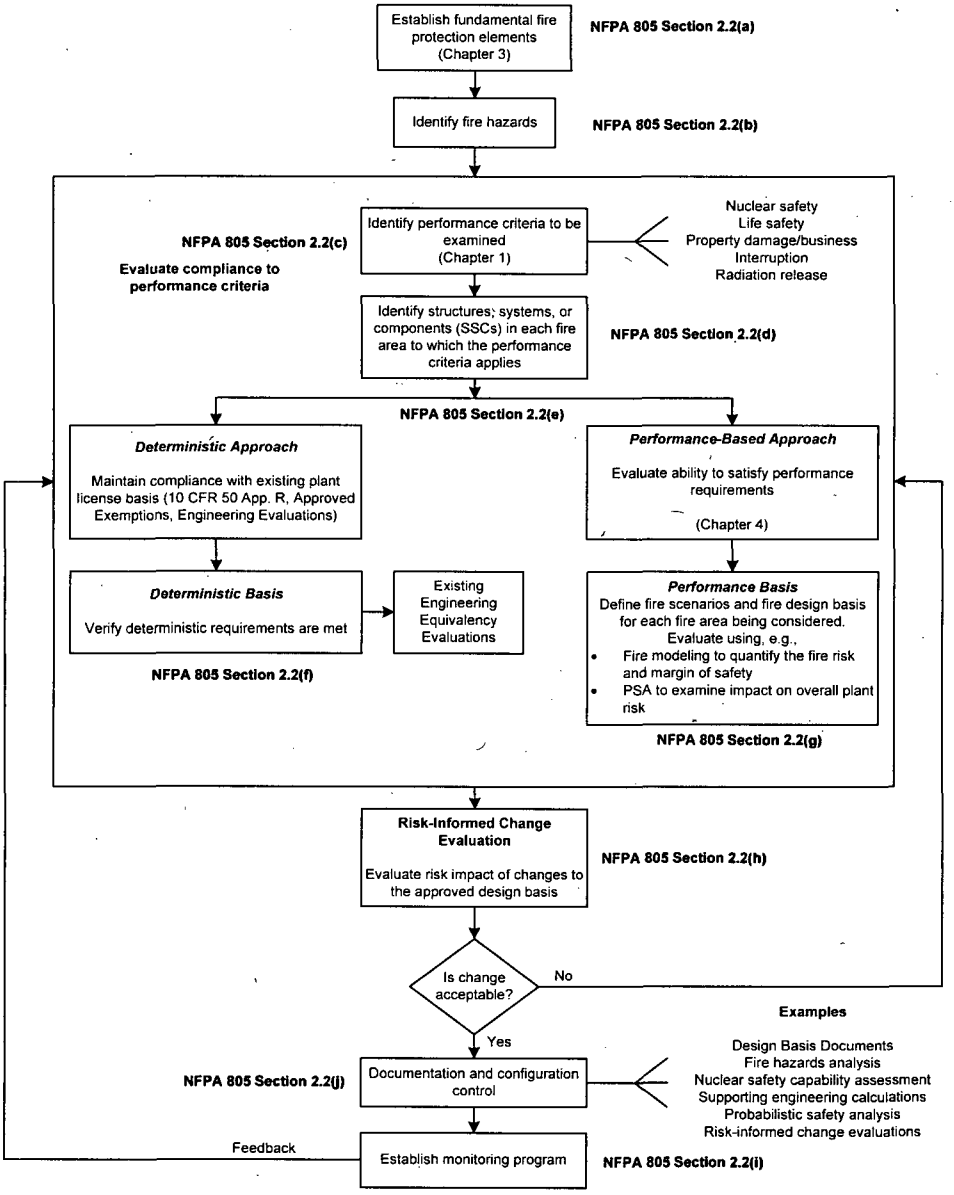


Figure 3-1 NFPA 805 Process [NEI 04-02 Figure 3-1 based on Figure 2-2 of NFPA 805][1]

3.3 NEI 04-02 – NFPA 805 Transition Process

NFPA 805 contains technical processes and requirements for a RI-PB fire protection program. NEI 04-02 was developed to provide guidance on the overall process (programmatic, technical, and licensing) for transitioning from a traditional fire protection licensing basis to a new RI-PB method based upon NFPA 805, as shown in Figure 3-2.

[1] Note: 10 CFR 50.48(c) does not endorse Life Safety and Plant Damage/Business Interruption goals, objectives and criteria

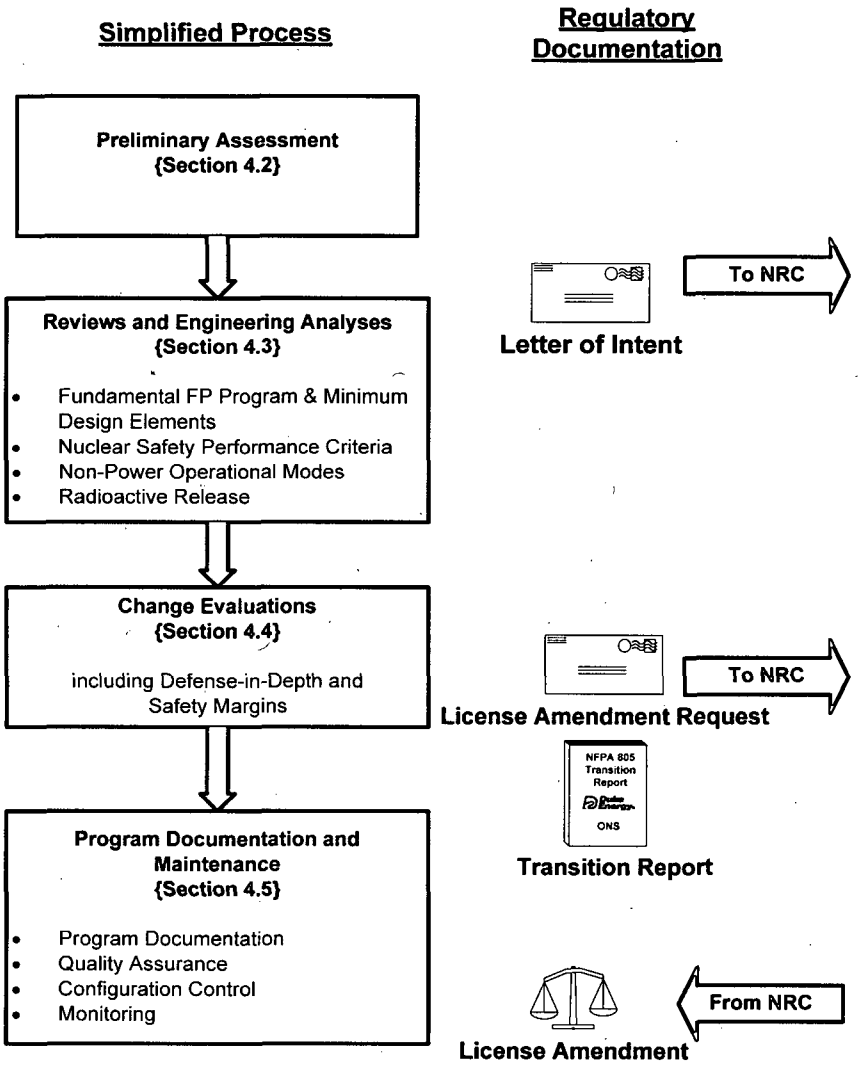


Figure 3-2 Implementing the New Licensing Basis [Based on NEI 04-02 Figure 3-3]

Section 4.0 of NEI 04-02 describes the detailed process for assessing a fire protection program for compliance with NFPA 805, as shown in Figure 3-3. ONS conducted the detailed evaluation processes by establishing teams comprised of knowledgeable personnel. The assessment processes used by these teams and the results of the assessments are discussed later in this report.

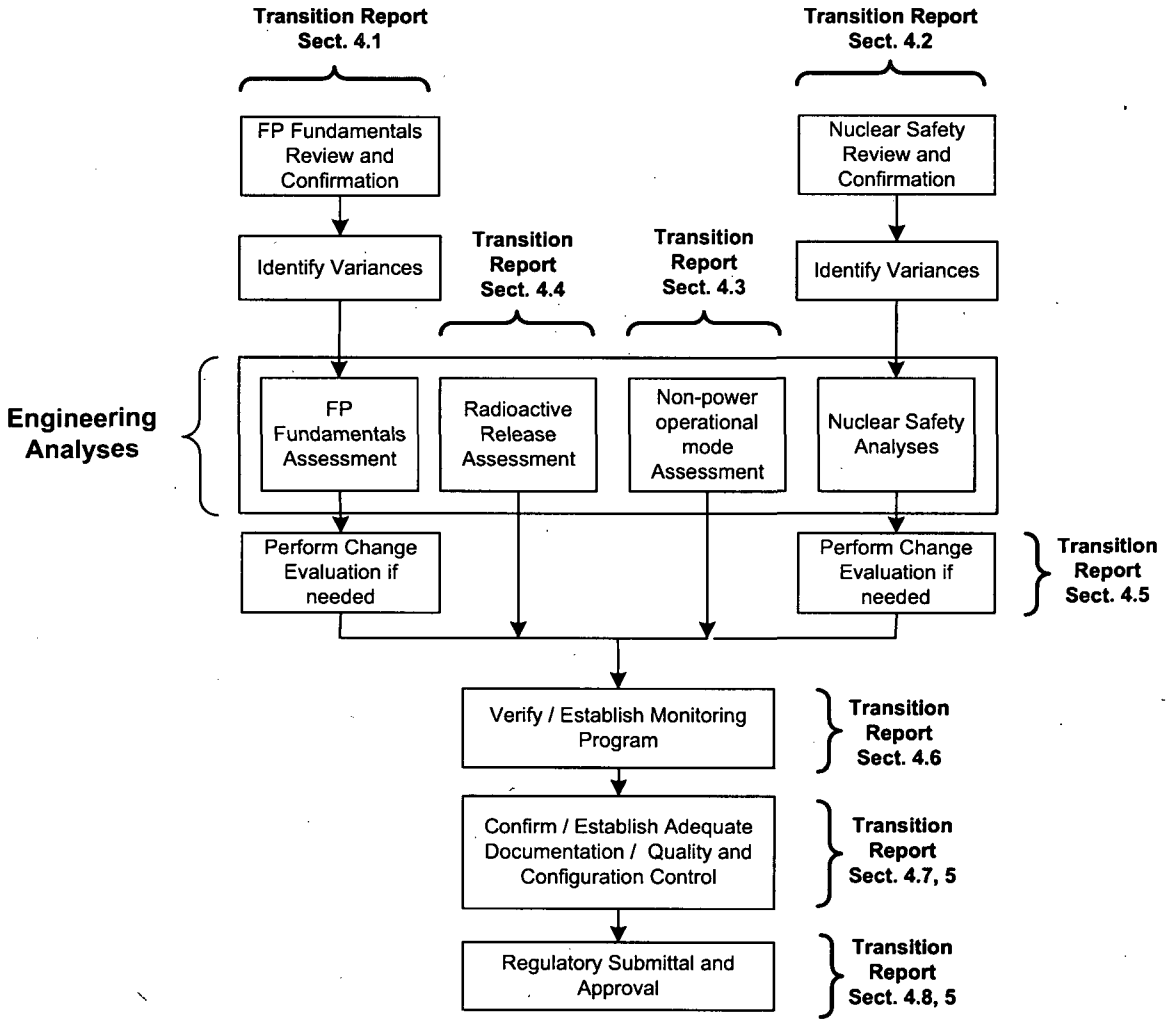


Figure 3-3 Transition Process (Simplified) [based on NEI 04-02 Figure 4-1]

3.4 NEI 04-02 Frequently Asked Questions (FAQs)

The NRC has worked with NEI and two Pilot Plants (ONS and Harris Nuclear Plant) to define the licensing process for transitioning to a new licensing basis under 10 CFR 50.48(c) and NFPA 805. Both the NRC and the industry recognized the need for additional clarifications to the guidance provided in RG 1.205, NEI 04-02, Revision 1, and NFPA 805. The NFPA 805 FAQ process was jointly developed by NEI and NRC to facilitate timely clarifications of NRC positions. This process is described in a letter from the NRC dated July 12, 2006, to NEI (ML061660105) and in Regulatory Issues Summary (RIS) 2007-19, Communicating Clarifications of Staff Positions in RG 1.205 Concerning Issues Identified During Pilot Application of NFPA Std 805, dated August 20, 2007 (ML071590227).

Under the FAQ Process, transition issues are submitted to the NEI NFPA 805 Task Force for review, and subsequently presented to the NRC during public FAQ meetings.

Once an acceptable FAQ is submitted to the NRC, the NRC issues a memorandum to indicate that the revised FAQ was acceptable. NEI 04-02 will be revised to incorporate the approved FAQs. This is an on-going revision process that will continue through the transition of NFPA 805 transition plants. Final closure of the FAQs will occur when RG 1.205, which endorses the new revision of NEI 04-02, is approved by the NRC. It is expected that additional FAQs will be written and existing FAQs will be revised as the Pilot Plant process continues. These changes should be documented in the ONS SER so there is clear documentation of the final methodology used in the development of the ONS transition.

Attachment H contains the FAQs, issued to date, that have been used to clarify the guidance in RG 1.205, NEI 04-02, NFPA 805 and in the preparation of this LAR.

4.0 COMPLIANCE WITH NFPA 805 REQUIREMENTS

4.1 Fundamental Fire Protection Program and Design Elements

The Fundamental Fire Protection Program and Design Elements are established in Chapter 3 of NFPA 805. Section 4.3.1 of NEI 04-02 provides a systematic process for determining the extent to which the CLB and plant configuration meets these criteria and for identifying the fire protection program changes that would be necessary for compliance. NEI 04-02 Appendix B-1 provides guidance on documenting the comparison of the Fire Protection Program requirements of NFPA 805 Chapter 3 to the current fire protection program.

4.1.1 Overview of Evaluation Process

The comparison of the ONS Fire Protection Program to NFPA 805 Chapter 3 (NEI 04-02 Table B-1) was performed using the methodology contained in a Duke Calculation entitled "NFPA 805 Transition B-1 Table/Report," and the guidance contained in FAQ 07-0036, Incorporation of Pilot Plant Lessons Learned - Table B-1. The methodology depicted in Figure 4-1 is as follows:

Each section and subsection of NFPA 805 Chapter 3 was reviewed against the current fire protection program and classified to meet one of the following criteria:

Comply - For those sections/subsections determined to meet the specific requirements of NFPA 805:

An implementing reference is provided for the compliance statement in the Reference Document Field.

- For administrative requirements such as required procedures, control of combustibles and ignition sources, fire brigade requirements, etc. provide a reference to the site or corporate procedure that provides the control required by the program. The reference will be to the highest level document that satisfies the requirement. For example, the requirement for ensuring the plant has procedures for inspection and maintenance of systems would reference the program procedure that establishes this requirement, rather than providing a list of all testing and inspection procedures.
- For system requirements such as water supply, automatic detection and suppression, manual suppression, fire extinguishers, and fire barriers provide the following:
  - For active systems (including extinguishers), a reference to the code compliance evaluation with a summary of evaluated deviations, the edition of code and a statement of the ability of the system(s) to meet its functional requirement.
  - For passive systems, a reference to specifications, design documents or test reports that demonstrate compliance with the systems.

  Note: only the suppression and detection systems required by Chapter 4 of NFPA 805 need to be transitioned in the new program. Reference FAQ 06-0004

Comply with Clarification - For those sections/subsections determined to meet the requirements of NFPA 805 with clarification:

- An implementing reference is provided for the compliance statement in the Reference Document Field.
- The clarification is provided in the compliance basis field.

Complies by previous NRC approval - For those sections/subsections where ONS does not meet the specific NFPA 805 Chapter 3 requirement but previous NRC approval of the configuration exists:

- Appropriate excerpts from licensee submittals regarding the issue for which previous approval is being claimed are included in the reference document field, as necessary. These excerpts are especially important if the licensee has clearly articulated a position/condition and the NRC generically accepted the overall fire protection feature/system.
- Appropriate excerpts from the NRC documents that provide the formal approval of the fire protection system/feature are included.
- An implementing reference is provided for the compliance statement in the 'Reference Document Field.'

Comply by Previous Licensee Evaluation (EEEEs) - For those sections/subsections determined to be equivalent to the regulation and/or requirement and documented by engineering analysis:

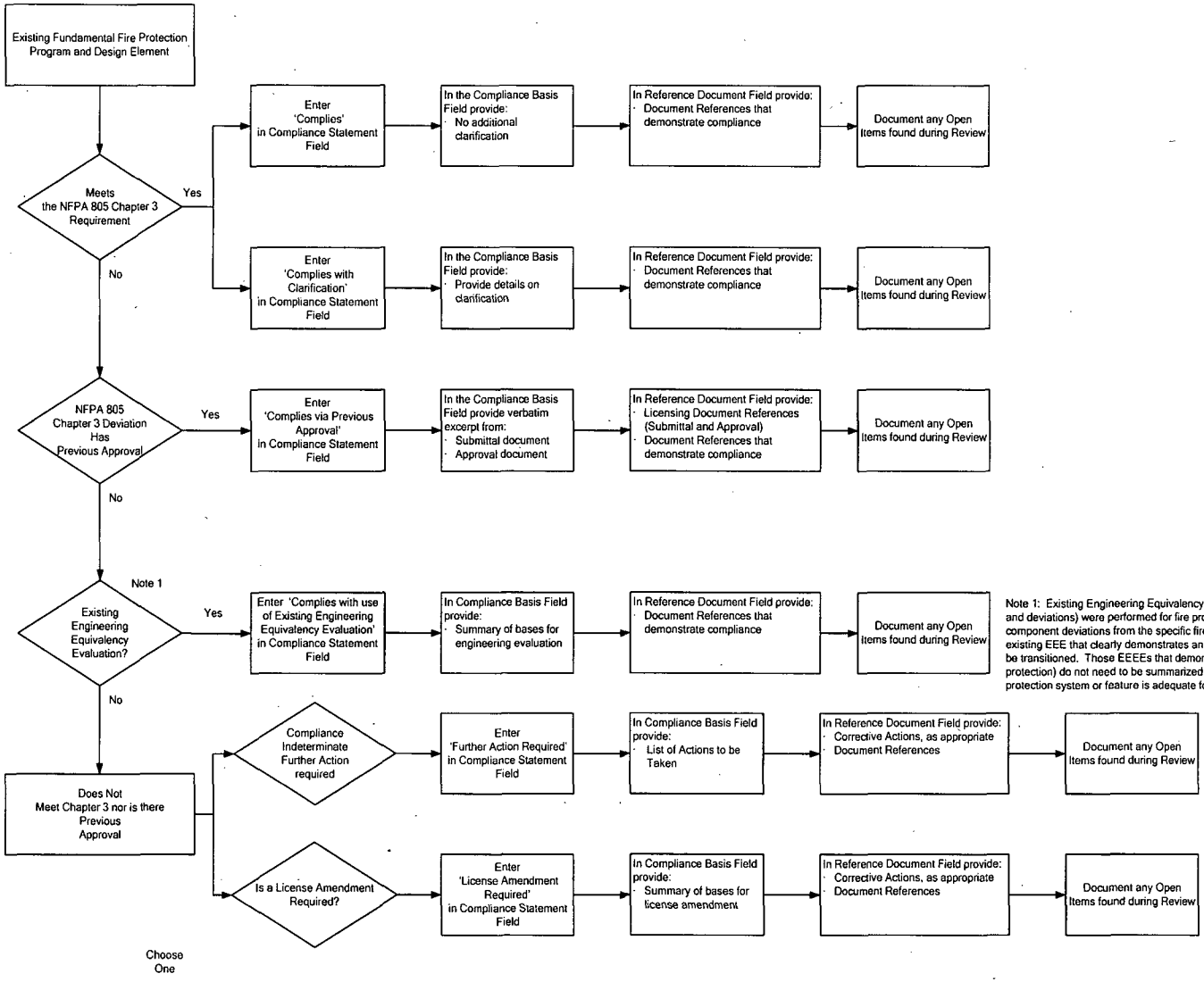
- An implementing reference is provided for the compliance statement in the Reference Document Field.
- A summary of the bases for acceptability of the engineering evaluation is provided in the Compliance Basis Field.

Further Action Required – For those sections/subsections that required additional analysis

- Document necessary analysis in an open item

Submit for NRC Approval

- Document issue requiring NRC approval in the Compliance Basis Field.
- Provide justification (Attachment L)



Note 1: Existing Engineering Equivalency Evaluations (previously known as Generic Letter 86-10 evaluations, exemptions, and deviations) were performed for fire protection design variances such as fire protection system designs and fire barrier component deviations from the specific fire protection deterministic requirements. Section 2.2.7 of NFPA 805 allows an existing EEE that clearly demonstrates an equivalent level of fire protection compared to the deterministic requirements to be transitioned. Those EEEEs that demonstrate that a system or feature is rated or compliant (i.e., equivalent level of protection) do not need to be summarized and submitted as part of the LAR. Those EEEEs that determine the fire protection system or feature is adequate for the hazard should be summarized in the LAR.

Figure 4-1 - Fundamental Fire Protection Program and Design Elements Transition Process [Based on NEI 04-02 Figure 4-2/FAQ 07-0036]

4.1.2 Results of the Evaluation Process

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

Requirements in NFPA 805 Chapter 3 that have been determined to "comply" or "complies by previous NRC approval" are included in Attachment A. References to the document(s) that justify that position are included in Attachment A.

4.1.2.2 NFPA 805 Chapter 3 Requirements Not Previously Approved by NRC

The following sections of NFPA 805 Chapter 3 are not specifically met nor do previous NRC approvals of alternatives exist:

- 3.3.1.2(1) – Approval is requested for the use of non fire retardant wood in special cases.
- 3.3.1.3.4 – Approval is requested for the use of temporary heaters

The specific deviation and a discussion of its equivalence to the deterministic requirements of NFPA 805 Chapter 3 are provided in Attachment L.

4.1.2.3 NFPA 805 Chapter 3 Requirements Requiring Clarification of Prior NRC Approval

The following sections of NFPA 805 Chapter 3 are those for which specific NRC previous approval is uncertain. For each section a discussion of ONS submittals and NRC's SER is provided

- None.

4.1.3 Definition of Power Block and Plant

The definition of "Power Block" and "Plant" as referenced in NFPA 805, Chapter 3 was clarified in FAQ 06-0019. "Power Block" and "Plant" refer to "Structures that have equipment required for nuclear plant operations," such as Containment, Auxiliary Building, Service Building, Control Building, Fuel Building, Radioactive Waste, Water Treatment, Turbine Building, and intake structures. These are the structures that are identified in the facility's CLB.

The "Power Block" structures are listed in Attachment I.

4.2 Nuclear Safety Performance Criteria Transition Review

The Nuclear Safety Performance Criteria are established in Section 1.5 of NFPA 805. Chapter 4 of NFPA 805 provides the methodology to determine the fire protection systems and features required to achieve the performance criteria outlined in Section 1.5. Section 4.3.2 of NEI 04-02 provides a systematic process for determining the extent to which the CLB meets these criteria and for identifying any necessary protection program changes. NEI 04-02, Appendix B-2 provides guidance on documenting the transition of Nuclear Safety Capability Assessment Methodology and the Fire Area compliance strategies.

4.2.1 Nuclear Safety Capability Assessment Methodology Review

4.2.1.1 Overview of Evaluation Process

The comparison of the ONS 10 CFR 50 Appendix R "Deterministic" safe shutdown methodology to NEI 00-01 Chapter 3 (NEI 04-02 Table B-2) was performed and documented in a Duke Calculation entitled, "NFPA 805 Transition B-2 Table", and the guidance contained in FAQ 07-0039, Lessons Learned – NEI 04-02 B-2 and B-3 Tables. The safe shutdown methodology review evaluates the existing post-fire SSA against the guidance provided in Section 2.4.2 of NFPA 805 for the Nuclear Safety Capability Assessment. This methodology review consisted of a review of NEI 00-01 Chapter 3, "Deterministic Methodology," as discussed in Appendix B-2 of NEI 04-02.

The methodology steps are depicted in Figure 4-2:

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

Step 2 – Determine and document the applicability of each section of Chapter 3 of NEI 00-01. Correlate the specific section of NFPA 805 2.4.2 to the corresponding section of NEI 00-01 Chapter 3. Note: NEI 00-01 Chapter 3 contains methodology and "acceptable methods," but does not contain regulatory requirements. NEI 00-01 Chapter 3 has methods that "can" and "may" be used to perform an analysis in an acceptable and/or efficient manner. Judgment will be necessary to determine the impact of a lack of alignment with NEI 00-01 guidance on the acceptability of the methodology transition. Based upon the content of the NEI 00-01 methodology statements, determine if the section is applicable to the station. Examples where a section may not be applicable include:

- For a PWR, guidance provided in NEI 00-01 specifically for BWRs.
- Specific references to equipment/equipment types/cable types that are not used at the plant under review.

Step 3 – Perform comparison of plant-specific safe shutdown methodology to applicable sections of NEI 00-01. Determine if failure to maintain strict alignment with the guidance in NEI 00-01 could have adverse consequences. Since NEI 00-01 is a guidance document, portions of its text could be interpreted as 'good practice' or intended as an example of an efficient means of performing the analyses. In some instances the commentary presents analytical preferences which can be performed in a number of different ways without impacting the validity of the results. These sections of NEI 00-01 can be dispositioned without further review. Document whether the plant:

- Aligns with the NEI guidance
- Aligns with intent
- Does not align, or
- Does not align but has previous approval

Provide the basis for the alignment statements.

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

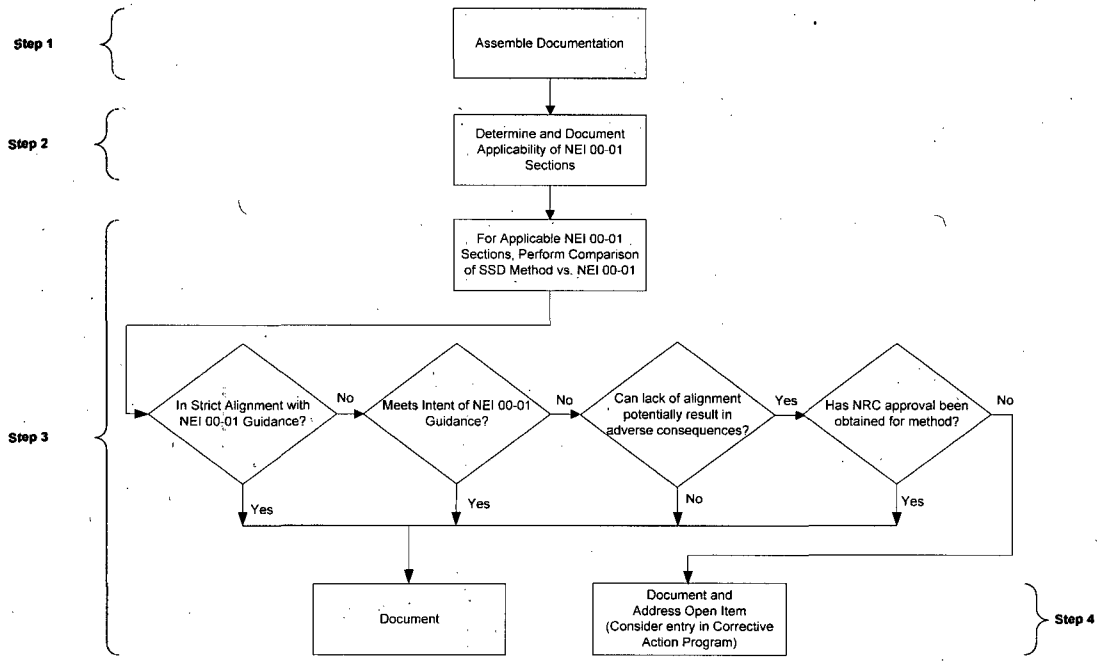


Figure 4-2 – Summary of Nuclear Safety Methodology Review Process (FAQ 07-0039)

4.2.1.2 Results from Evaluation Process

The specific results of the ONS Nuclear Safety Capability Assessment Methodology Review are included in Attachment B. The ONS methodology aligns with the guidance in NEI 00-01 with the following exceptions:

- The circuit coordination analysis for ONS requires an update. The assumption of circuit coordination in the SSA needs to be validated.
- NEI 00-01 methodology has been supplemented by the guidance for analyzing MSOs (FAQ 07-0038). Attachment F contains the details of the MSO Methodology for ONS.
- NEI 00-01 methodology for Operator Manual actions will be supplemented with the evaluation of the acceptability of operator manual actions (Change Evaluations) and the guidance for evaluating the additional risk associated with the use of Recovery Actions as compliance strategies (FAQ 07-0030). Attachment G contains the Recovery Action Methodology for ONS.
- Potential fire damage has not been specifically evaluated in regard to the ability to manually operate valves post fire.

It is important to highlight one specific difference between the requirements of 10 CFR 50, Appendix R and NFPA 805 in this section. 10 CFR 50, Appendix R includes the requirement to achieve CSD (per Section III.L) or make the repairs to systems necessary to achieve and maintain cold shutdown within 72 hours (per Section

III.G.1.b). The nuclear safety goal of NFPA 805 requires "*...reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition*" without a specific reference to a mission time or event coping duration. For the plant to be in a safe and stable condition, it may not be necessary to perform a transition to cold shutdown as currently required under 10 CFR 50, Appendix R. Therefore, the unit may remain in hot standby for the event. In the event that a safe and stable plant condition cannot be achieved without cooldown to cold shutdown, the assessment should document the method for accomplishing cold shutdown including required recovery actions (formerly operator actions or repairs). Note FAQ 07-0040 addresses non-power operational modes transition.

4.2.2 Fire Area-by-Fire Area Transition

4.2.2.1 Overview of Evaluation Process

The Fire Area-by-Fire Area Transition of the ONS Fire Protection Program (NEI 04-02 Table B-3) was performed using the methodology contained in a Duke Calculation entitled, "NFPA-805 Transition B-3 Table/Report," and the guidance contained in FAQ 07-0039, Lessons Learned – NEI 04-02 B-2 and B-3 Tables. The methodology for performing the Fire Area-by-Fire Area Transition depicted in Figure 4-3 is outlined as follows:

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

Step 2 – Assess accomplishment of performance goals. Document the method of accomplishment, in summary level form, for the fire area. The description of key assumptions utilized in the SSD analysis and an overview of accomplishment of each of the performance goals are included in Attachment C.

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

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

Step 5 – Document results and define Open Items/Change Evaluations.

Documenting the review of SSD documents (Step 1), assessment of performance goal accomplishment for each fire area (Step 2), reviewing fire area licensing actions (Step 3), and reviewing engineering evaluations (Step 4) resulted in the creation of open items that will be reviewed and assessed as part of the Change Evaluation process.

- All open items were reviewed and dispositioned by fire area (and topic), if appropriate, in order to gain an overall understanding of the magnitude and complexity of the individual issues, as well as their aggregate impact. The following criterion was used to select those fire area open items which were identified as include in LAR/TR "Yes" (These open items will be evaluated for

possible closure using the NFPA 805 RI-PB Change Evaluations (See Section 4.5)):

- Unallowed operator manual actions for stable hot standby
- Items outside the CLB
- Spurious valve operations due to IN 92-18
- Need for additional supporting thermal hydraulic analysis (potential effect on method of accomplishment of performance goals)
- Lack of suppression and detection
- Actions performed within the credited first 10 minutes

- Open items which were identified as include in LAR/TR "No" were generally:
  - Minor procedure deficiencies
  - Transition to CSD and CSD actions
  - Bin A through G actions
  - SSA documentation discrepancies
  - Items in compliance

In addition to documenting open items, provide the following information:

- Document if suppression and detection is installed in the area and if the suppression and detection is required to be installed in the area in accordance with current 10 CFR 50 Appendix R compliance.
- Document the results of the effect of fire suppression activities on nuclear safety performance criteria.
- Provide any additional summary level information applicable to the fire area that is outside of the content in the performance SSD goals in the Fire Area Comments field.

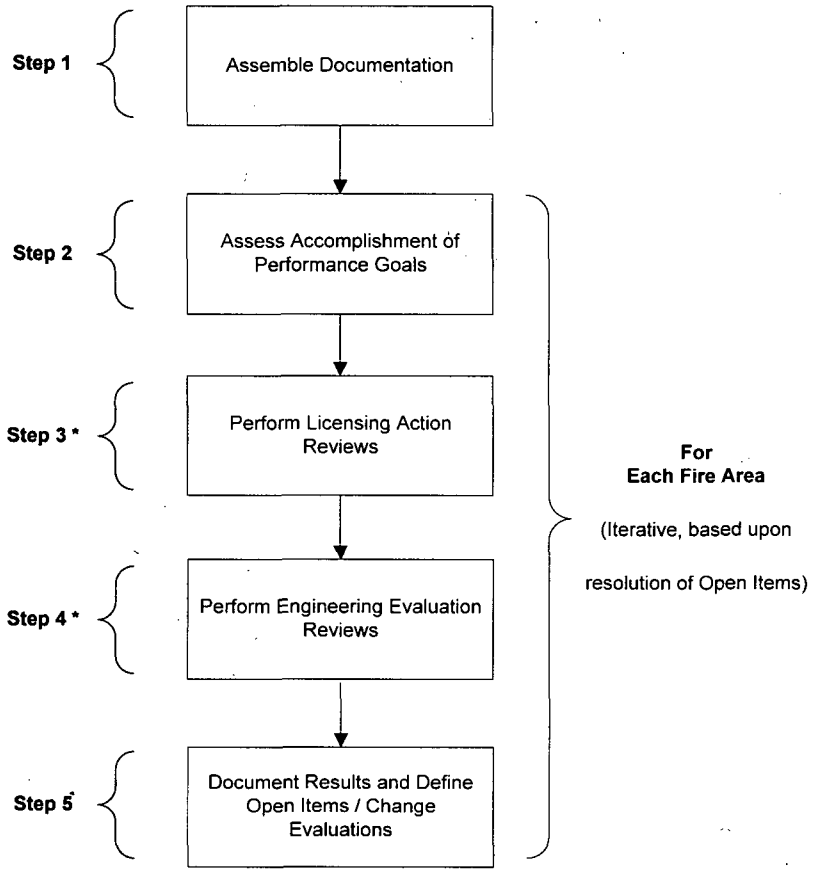


Figure 4-3 – Summary of Fire Area-by-Fire Area Review (FAQ 07-0039)

4.2.2.2 Results of the Evaluation Process

4.2.2.2.1 Results of the Existing Engineering Equivalency Evaluation Review

The EEEE review was performed using the methodology contained in FAQ 07-0033, Transition of Existing Engineering Equivalency Evaluations. The methodology for performing the EEEE review includes the following:

- Determination that the EEEE is not based solely on quantitative risk evaluations,
- Determination that the EEEE is an appropriate use of an engineering equivalency evaluation,
- Determination that the EEEE is of appropriate quality,
- Determination that the standard license condition is met,
- Determination that the EEEE is technically adequate, and
- Determination that the EEEE reflects the plant as-built condition.

In accordance with the guidance provided in RG 1.205, Revision 0, Regulatory Position C.3.2.4 and FAQ 07-0033, Transition of Existing Engineering Equivalency Evaluations, EEEEs identified in Attachment J as 'Include in LAR/TR – Yes' are evaluations of variances from the requirements of NFPA 805 Chapter 3 and as such are included in the LAR.

4.2.2.2.2 Results of the Licensing Action Review

The existing licensing actions (exemption requests) review was performed using the methodology contained in a Duke Calculation entitled "NFPA 805 Transition Licensing Action Review". The methodology for the licensing action review included the following:

- Determination of the bases for acceptability of the licensing action
- Determination that these bases for acceptability are still valid and required for NFPA 805

Licensing Actions were reviewed at ONS. All licensing actions will be transitioned into the post-transition NFPA 805 fire protection program. Since these licensing actions (exemptions and approval of the SSF) are considered compliant under 10 CFR 50.48(c), they will be superseded as part of the LAR process. Attachment K contains the results of the Licensing Action Review.

In accordance with the requirements of 10 CFR 50.48(c) these licensing actions are being superseded and are also included in Attachment O, Orders and Exemptions.

4.2.2.3 Results of the Fire Area-by-Fire Area Review

Attachment C contains a description of key assumptions utilized in the SSD analysis and an overview of accomplishment of each of the performance goals. Attachment C also contains the results of the Fire Area Transition review (NEI 04-02 Table B-3). The NEI 04-02 Table B-3 includes the following summary level information for each fire area:

- Regulatory Basis – Both the 10 CFR 50, Appendix R pre-transition (e.g., III.G.1.b, G.2.b, etc.) and NFPA 805 post-transition (4.2.3 or 4.2.4) regulatory bases are included.
- Performance Goal Summary – An overview of the method of accomplishment of each of the performance criteria in NFPA 805 Section 1.5 is provided.
- Reference Documents – Specific References to Nuclear Safety Capability Assessment Documents are provided.
- Licensing Actions – Specific References to Exemption Requests that will remain part of the post-transition licensing basis and the Basis for Acceptability of that Licensing Action.
- EEEE – Specific References to EEEE that rely on determinations of "adequate for the hazard" that will remain part of the post-transition licensing basis and the Basis for Acceptability of that EEEE.
- Open Items – Specific References to Open Items such as modifications, Change Evaluations, TH analyses, or procedural changes. The open items are required

to be resolved in order to demonstrate post-transition compliance. Refer to Section 4.5 for a discussion of the change evaluations.

As pointed out in Section 4.2.1.2, given a fire, NFPA 805 does not require a plant to transition to cold shutdown. The fire area-by-fire area assessment documents the method of accomplishment of the NFPA 805 performance goals (including the transition to cold shutdown). During transition, ONS did not attempt to change the SSD analysis to remove equipment/cables (and protection strategies) that were required to achieve and maintain cold shutdown. However, as allowed by the NFPA 805 change process and the revised license condition, ONS may revise these strategies.

4.3 Non-Power Operational Modes

4.3.1 Overview of Evaluation Process

The current industry approach for evaluating risk during shutdown conditions involves qualitative and/or quantitative assessments and is based on NUMARC 91-06, Guidelines for Industry Actions to Assess Shutdown Management, as documented in NEI 04-02 and FAQ 07-0040, Non-Power Operations Clarification. The strategy for controls/protection of equipment during NPO modes for plants adopting NFPA 805 is a combination of the normal fire protection defense-in-depth actions; and additional risk-informed steps based on the availability of systems and equipment needed to support KSFs and whether or not the plant is in a HRE. The goal (as depicted in Figure 4-5) is to ensure that contingency plans are implemented when the plant is in an HRE, and there is the possibility of losing a KSF due to fire. Additional controls/measures are evaluated during NPO modes where the risk is intrinsically high[2]. During low risk periods, normal risk management controls and fire prevention/protection processes, along with procedures will be utilized.

The process to demonstrate that the nuclear safety performance criteria are met during NPO modes involves the following steps:

- Review the existing Outage Management Processes
- Identify Equipment/Cables
  - Review plant systems to determine success paths that support each of the defense-in-depth KSFs,
  - Identify cables required for the selected equipment and determine the routing
- Perform Fire Area Assessments

[2] According to Section 1.3.1, "Nuclear Safety Goal," of NFPA 805, "[t]he nuclear safety goal shall be to provide *reasonable assurance* that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition." As stated, this does not mandate a fire risk evaluation comparable to what would be expected during full power. Therefore, it is recognized that, for non-power operations, a "risk-informed" approach has been developed which addresses what is believed to be (and evidenced through the referenced studies) the most risk-significant POSs during non-power operations when including considerations of fire effects, namely total loss of a KSF. As such, these are expected to account for most, if not all, POSs that can be considered "intrinsically high" when considering fire effects." This approach, while compliant with 10 CFR 50.48(c), does not constitute a complete surrogate for a non-power risk evaluation since, under plant-specific conditions (believed to be relatively rare), there may be non-power POSs where less than total loss of a KSF (e.g., a reduction in the availability of credited paths ["redundancy decrease"] such that at least one path still remains), including consideration of fire effects, could result in a risk-significant contribution.

- Manage risk associated with fire-induced vulnerabilities during the outage

These steps, as described in the following sections, and the process, as depicted in Figures 4-4 and 4-5, will be implemented at ONS. The results of this process will be included with the supplemental LAR.

4.3.1.1 Review Existing Outage Management Processes

To begin the process of assessing the fire protection plan for NPO modes, discussions will be held between the PRA, Fire Protection Engineer, and Outage Management Staff to determine the best way to integrate NFPA 805 fire protection aspects into existing Outage Management Processes.

Included in this review is defining what is considered a HRE, if not already defined in plant outage management procedures. The HRE definition should consider the following:

- Time to boil
- Reactor coolant system and fuel pool inventory
- Decay heat removal capability

In accordance with NUMARC 91-06, activities that may impact KSFs are limited and strictly controlled during HREs or infrequently performed evolutions.[3]

4.3.1.2 Identify Equipment/Cables

The identification of systems and equipment to be included in this NPO review begins with the identification of the Plant Operational States (POSs) that need to be considered during HREs identified. The following discussion identifies the generic operational states that a plant goes through during NPO, and which ones are the most risk significant (HREs). These generic definitions of the following simplified POSs are contained in NRC Inspection Manual IM0609, Appendix G, Attachment 2, Phase 2 Significance Determination Process Template for PWR during Shutdown, and are included here for use in reading Table 4-1.

PWR [IM0609, Appendix G, Attachment 2]

"POS 1 - This POS starts when the RHR system is put into service. The RCS is closed such that a steam generator could be used for decay heat removal, if the secondary side of a steam generator is filled. The RCS may have a bubble in the pressurizer. This POS ends when the RCS is vented such that the steam generators cannot sustain core heat removal. This POS typically includes Mode 4 (hot shutdown) and portions of Mode 5 (cold shutdown).

POS 2 - This POS starts when the RCS is vented such that: (1) the steam generators cannot sustain core heat removal and (2) a sufficient vent path exists for feed and bleed. This POS includes portions of Mode 5 (cold shutdown) and Mode 6

[3] Ibid.

(refueling). Reduced inventory operations and midloop operations with a vented RCS are subsets of this POS...

POS 3 - This POS represents the shutdown condition when the refueling cavity water level is at or above the minimum level required for movement of irradiated fuel assemblies within containment as defined by Technical Specifications. This POS occurs during Mode 6."

Disposition of the generic POSs (to determine which POSs required the identification of systems and equipment to support KSF) is provided in Table 4-1. For other non-power conditions, e.g., PWR Mode 3, normal fire protection program controls, processes and procedures will be used.

Table 4-1 - PWR POS Disposition For Equipment Selection

POS/Configuration	Disposition	Discussion
POS 1 with SG Heat Removal Available	No additional reviews required under NEI 04-02, Section 4.3.3 (as modified by FAQ 07-0040) based upon previous risk reviews. Normal fire protection and prevention practices apply.	In this POS, if SGs are available in addition to RHR, significant redundancy and diversity exists for heat removal. Just having inventory in the SGs can provide substantial passive heat removal, providing additional time to recover other heat removal methods Inventory control is not generally challenged during this POS.
POS 1 with SG Heat Removal Unavailable [Consider limiting to configurations where time to boil is less than 2 hours and/or RCS level is being changed]	Perform actions per NEI 04-02, Section 4.3.3 (as modified by FAQ 07-0040).	Without SG Heat Removal capability, heat removal is limited to RHR and potentially bleed and feed. RCS pressurization on loss of heat removal could render RHR unavailable due to high pressure. Activities in this POS often involve changing RCS level. During RCS level changes, the likelihood of loss of inventory control is higher, challenging the inventory control safety function.
POS 2	Perform actions per NEI 04-02, Section 4.3.3 (as modified by FAQ 07-0040).	This is the generally the highest risk configuration/POS for a PWR. Due to low inventory, times to core boil are low, typically on the order of 2 hours or less.
POS 3	Evaluate potential RCS drain paths that could be affected by fire	During this POS, substantial inventory exists to cope with an extended loss of active heat removal. Times to boil are often on the order of 16 or more hours. However, fire induced RCS draindown events can reduce margins substantially.

After identifying the plant-specific POSs that require additional equipment for inclusion in the NPO review, the following steps will be performed:

- Existing plant outage processes (outage management and outage risk assessments) to determine KSFs that support the POSs of concern will be reviewed.
- Equipment (mechanical and electrical) relied upon to provide KSF, including support functions, during the POS to be evaluated, will be determined.
- Equipment credited for achieving these KSFs will be compared against the equipment credited for nuclear safety, including a comparison of required equipment positions/functions.
- For equipment not already credited (or credited in a different way e.g., on versus off, open versus closed, etc.), the circuits will be analyzed in accordance with the nuclear safety methodology. Cables to be included in the NPO review will be identified.
- For cables (other support components) that are not already credited in the nuclear safety capability assessment, routing of the cables will be determined.

4.3.1.3 Perform NPO Fire Area Assessments

Locations will be identified where:

1) Fires may cause damage to the equipment (and cabling) credited above, or
2) KSFs are achieved solely by crediting recovery actions, (e.g., alignment of gravity feed.)

A pinch point for purposes of this assessment is defined as a location where all success paths for a KSF are subject to damage by a single fire. Fire modeling may be used to determine if postulated fires in a fire area are expected to damage equipment (and cabling) thereby eliminating a pinch point.

4.3.1.4 Manage risks associated with fire-induced vulnerabilities during the outage

The management of risks associated with fire-induced vulnerabilities during NPO varies based on whether or not the plant is in a low or HRE as follows:

- During those NPO evolutions where risk is relatively low:

  The normal fire protection program defense-in-depth fire protection features and administrative controls will be credited for addressing the risk impact of those fires that potentially impact one or more trains of equipment that provide a KSF required during NPO modes, but would not be expected to cause the total loss of that KSF. The following are considered to be adequate to address minor losses of system capability or redundancy:

  - Control of Ignition Sources
    - Hot Work (cutting, welding and/or grinding).
    - Temporary Electrical Installations.
    - Electric portable space heaters.
  - Control of Combustibles/Flammables

- Transient fire hazards.
- Modifications.
- Flammable and Combustible liquids and gases.

o Compensatory Actions for fire protection system impairments
- Openings in fire barriers.
- Inoperable fire detectors or detection systems.
- Inoperable fire suppression systems.

o Housekeeping

- During those NPO evolutions that are defined as HREs:

Additional fire protection defense in depth measures will be taken during HREs:

o Managing risk in fire areas that contain known pinch points (all success paths for a KSF subject to damage by a single fire).

o Managing risk in fire areas where pinch points may arise because of equipment taken out of service.

NUMARC 91-06 discusses the development of outage plans and schedules. One key element of that process is to ensure the KSFs perform as needed during the various outage evolutions. During outage planning, the NPO Fire Area Assessment will be reviewed to identify areas of single-point KSF vulnerability during HREs to develop any needed contingency plans/actions. For those areas, combinations of the following options may be implemented to reduce fire risk, depending upon the significance of the potential damage:

o Prohibition or limitation of hot work in fire areas during periods of increased vulnerability.

o Verification of functional detection and/or suppression in the vulnerable areas.

o Prohibition or limitation of combustible materials in fire areas during periods of increased vulnerability.

o Consideration of removing power from equipment once it is placed in its desired position to prevent spurious operation.

o Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures during increased vulnerability.

o Use of recovery actions to mitigate potential losses of KSFs.

o Monitoring equipment for "fire precursors" e.g., high bearing temperatures, low oil level, etc.

In addition, for KSF equipment removed from service during the HREs, the impact will be evaluated based on KSF equipment status and the NPO Fire Area Assessment to develop needed contingency plans/actions.

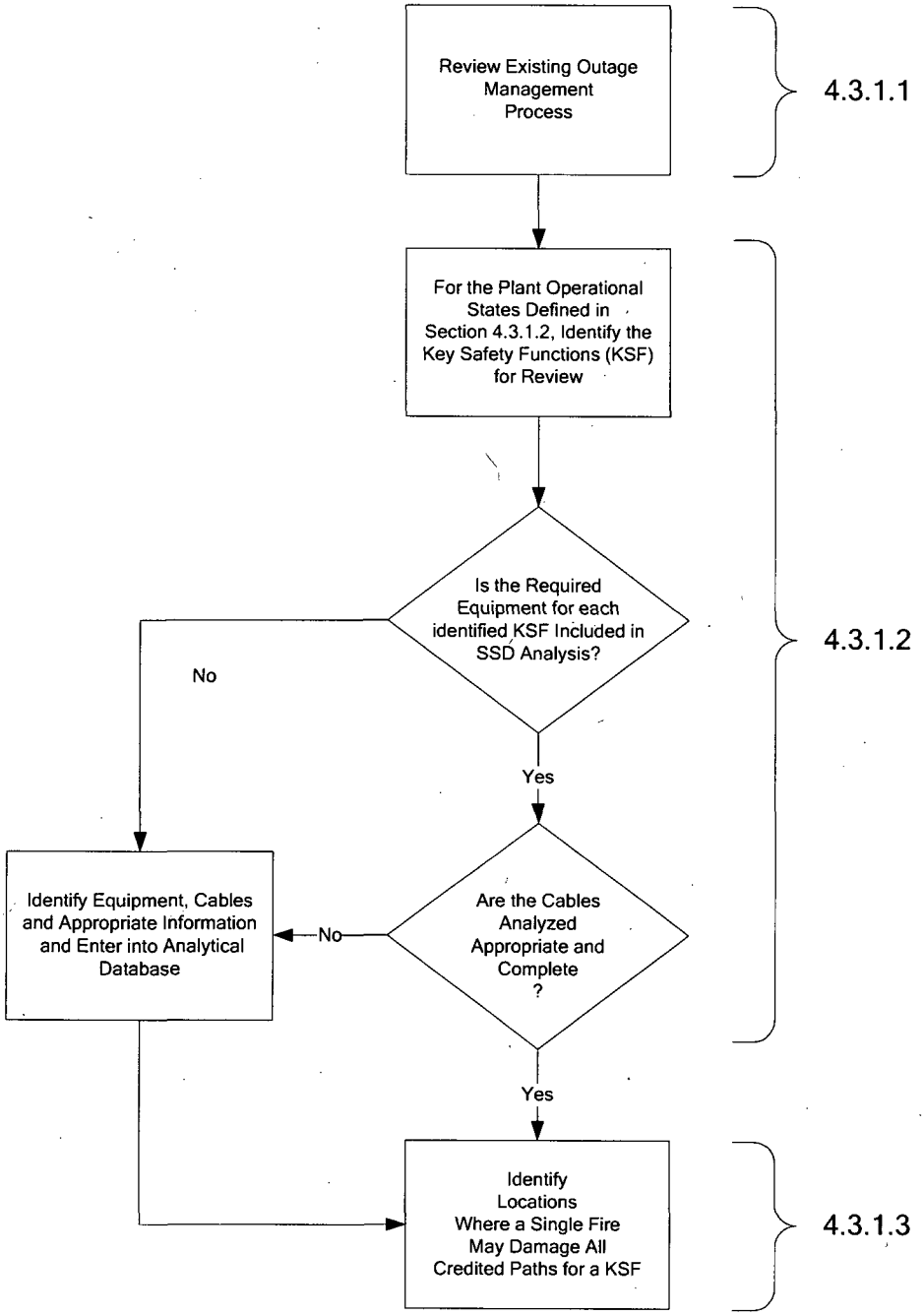


Figure 4-4 Review POSs, KSFs, Equipment, and Cables, and Identify Pinch Points

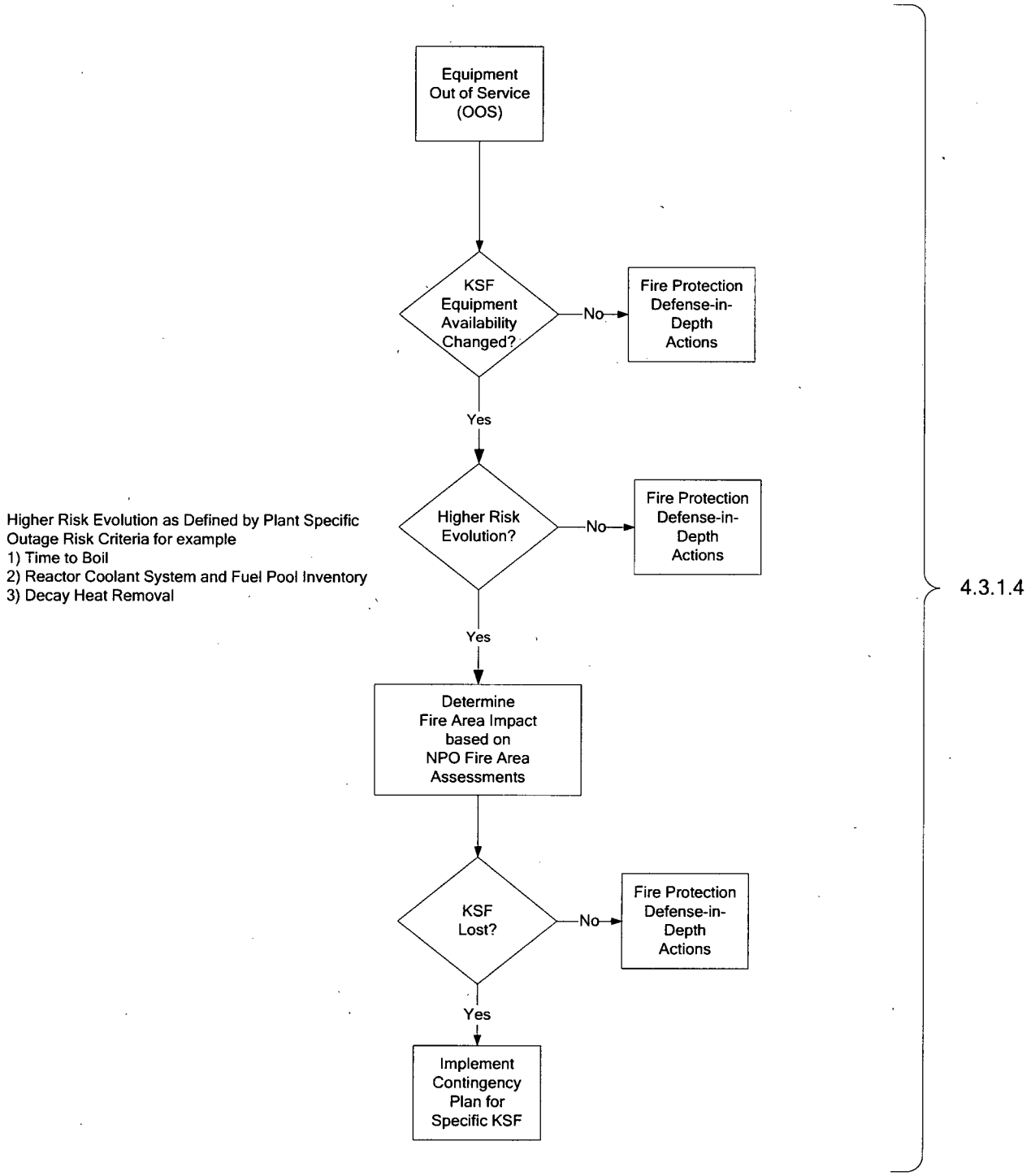


Figure 4-5 Manage Risks

4.3.2 Results of the Evaluation Process

The results of this process will be included with the supplemental LAR.

4.4 Radioactive Release Performance Criteria

4.4.1 Overview of Evaluation Process

The review of the ONS Fire Protection Program against NFPA 805 requirements for fire suppression related radioactive release (NEI 04-02 Table G-1) was performed using the methodology contained in a Duke Calculation entitled, "NFPA 805 Transition Radiological Release G-1 Table." The methodology steps are outlined as follows:

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

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

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

Step 4 – Provide documentation.

4.4.2 Results of the Evaluation Process

The ONS radioactive release review determined the current Fire Protection program is compliant with the requirements of NFPA 805 and the guidance in NEI 04-02 and RG 1.205, with the exception of the 10 CFR 20 limits. ONS has prior NRC approval for the concentration of radioactive material in releases of liquid effluents at anytime from the site boundary to unrestricted areas (denoted in Figure 2.1-4(a) of the ONS UFSAR) that shall be limited to 10 times the effluent concentrations specified in 10 CFR 20.

The site specific review of the direct effects of fire suppression activities on radioactive release is summarized in Attachment E, the NEI 04-02 Table G-1.

Pre-fire plans for zones 1-47 are outside the Radiological Control Area (RCA) and therefore were screened from further review. Pre-fire plans for outbuildings which may be used for storage of radioactive materials and which may house an RCA were included in the review.

A Standard Operating Guideline No. 16, Fires within a RCA/RCZ, has been created to address smoke management as well as potentially contaminated water run off when fires involve potentially contaminated areas that may not be identified in the Pre-fire plan. These areas may include Radiation Protection laboratories and storage areas where sources are not static, but moved, as well as other Radiological Control Zones (RCZs) that may be established for short-term periods such as maintenance.

A new lesson plan for control and monitoring of potential radioactive releases, consistent with Standard Operating Guideline No. 16, will be developed and incorporated into initial fire brigade training curriculum.

4.5 Change Evaluations

4.5.1 Fire PRA Development and Acceptance

A Fire PRA model is being developed for ONS using the guidance provided in NUREG/CR-6850/EPRI TR-1011989. The resulting model was reviewed against the requirements of ASME/ANS RA-S-2008. Since ONS is a Pilot Plant, an NRC review of the Fire PRA was conducted in lieu of a Peer Review. Subsequently, as noted in Section 3.4 the technical specifics for some elements were altered or modified via the FAQ process. Attachment H provides a listing of the approved FAQs that affect the overall license transition process for ONS. The resulting fire risk assessment model is used as the analytical tool to perform Change Evaluations during the transition process and to develop estimates of the potential change in fire related risk associated with those changes.

The supporting calculations for the Unit 3 Fire PRA are awaiting approval. The open items from the Fire PRA NRC review and the internal events PRA self- assessment with potential quantification implications will be addressed within the sensitivity analysis included as part of the Change Evaluations in support of the supplement to the LAR. A Unit 2 Fire PRA has been developed and will be completed to support the supplement to the LAR. For Unit 1, a comparative screening analysis of the Fire PRA will be performed in lieu of a unique fault tree. The Unit 1 Fire PRA screening analysis will be completed to support the supplement to the LAR.

4.5.1.1 Fire PRA Development

Note: This section is considered draft due to the fact that the supporting calculation, "PRA Quality Self-Assessment" has not been approved.

The ONS Fire PRA model being developed uses guidance contained in NUREG/CR-6850/EPRI TR-1011989, EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities. The ONS base internal events PRA (ONS PRA Model OR3a) was the starting point for the final Fire PRA for Unit 3. The internal events PRA was modified as required capturing the effects of fire both as an initiator of an event and the subsequent potential failure modes for affected circuits or individual targets. The Fire PRA is quantified using the EPRI FRANC software.

ONS participated in the B&WOG PRA Certification Program May 7-11, 2001. The ONS PRA has been evaluated so as to ensure technical adequacy of the model. This includes a review and disposition of outstanding A and B F&Os identified in the Peer Review process. Based on the PRA peer review report issued in October 2001, the ONS PRA received four F&Os with the significance level of "A" and thirty-five F&Os with the significance level of "B." All four of the "A" F&Os have been addressed and incorporated into ONS PRA Rev. 3a update. Twenty-eight of the "B" F&Os have already been incorporated into Revision 3a of the PRA. The seven remaining open "B" F&O items have been reviewed for impact on the Fire PRA. Two F&O items are related to improving the documentation of the HRA analysis, three F&O items are related to Level 2/3 of the PRA, and the remaining two open F&O items are related to improving documentation in the thermal hydraulic analyses. The review concluded that there are no outstanding "A" or "B" F&Os from the ONS Peer Review that affect this LAR.

In January 2008, Duke performed a self-assessment of the ONS PRA against RG 1.200, An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities, Revision 1. This self assessment updates the Maracor Report dated August 31, 2006, that the NRC referenced in Finding IEPRA-1. The assessment indicated that there are forty-four ASME PRA Standard Supporting Requirements (SRs) that are not fully met. Of these, thirty-six pertain to the need to enhance documentation, and the remaining eight are technical. That is, they have the potential to impact the risk results. Of the eight technical SRs, three are relevant to NFPA 805. Of these three, only two are judged to have the potential to have a meaningful impact on the fire results: HR-D6 (Use mean values for pre-initiator HEPs) and HR-G9 (Use mean values for post-initiator HEPs). Sensitivity analyses will be performed to assess the impact of the SRs on the fire analysis results.

The results and conclusions of Duke's self assessment against RG 1.200 will be documented in a Duke Calculation entitled, "PRA Quality Self-Assessment." Completion of this calculation is being tracked in the corrective action program.

4.5.1.2 Fire PRA – NRC Review

Note: This section is considered draft due to the fact that it is based on draft results of the NRC staff review

The NRC Fire PRA Review of the ONS Fire PRA was conducted March 17-21, 2008. The NRC Fire PRA Review, which was required by RG 1.205, noted that there were a number of incomplete high level and supporting requirements.

The NRC issued preliminary results of the ONS Fire PRA Review on April 10, 2008 (ML080940639). The identification and resolution of the high level findings from the NRC Fire PRA Review are summarized in Table 4-2.

Table 4-2 ONS Fire PRA NRC Review - Findings

SR	Topic	Status
CS-B1-1	Breaker coordination study incomplete (self identified)	Open; Completion is being tracked in the corrective action program.
CS-C4-1	Breaker coordination documentation	Same as above
FQ-A2-1	Initiating events not defined for all fire scenarios	Complete
FQ-B1-1	Demonstrate convergence for selected truncation limit (FPIE issue)	Since FPRA solves for CCDP/CLERP at one order of magnitude greater than internal events, there is not a truncation issue for the Fire PRA (reference related finding IEPRA-2 and corrective action document)
FQ-C1-1	Use of nominal HEP values may result in loss of cutsets before application of recoveries/multipliers	Complete
FQ-E1-1	Identification of significant contributors	Complete

Table 4-2 ONS Fire PRA NRC Review - Findings

SR	Topic	Status
FQ-F1-1	Improve LERF documentation	Complete
FSS-A5-1	Horizontal propagation for cables with PVC jackets (self identified)	Complete
FSS-C5-1	Potential for PVC pooling may impact assumed damage threshold	Complete
FSS-D5-1	Justify use of 75% HRR for transient fires	Complete
FSS-D6-1	Justify fire brigade response time with respect to formation of HGL	Complete
FSS-G1-1	Multi-compartment analysis incomplete	Complete
FSS-G2-1	Multi-compartment analysis screening criteria not defined	Complete
FSS-G3-1	Multi-compartment analysis screening incomplete; MCA not scenarios defined for quantification	Complete
FSS-G4-1	Multi-compartment analysis did not consider potential for barrier failure	Complete
FSS-G5-1	Multi-compartment analysis did not assess active fire barriers	Complete
FSS-G6-1	Assessment of MCA scenarios relative to fire risk not performed	Complete
FSS-H2-1	Document resolution of PVC pooling issue	Complete
FSS-H8-1	Multi-compartment analysis documentation incomplete	Complete
FSS-H9-1	Document justification for fire brigade response time	Complete
HR-G7-1	Dependencies should be reviewed with respect to timing	Open; Completion of the FPIE items is being tracked in the corrective action program
HRA-B2-1	HRA documentation for CASWHPIDHE and CEF0ASWDHE insufficient	Open; Completion of the FPIE items is being tracked in the corrective action program
HRA-C1-1	Need to consider relative timing of HFE in fire scenario; time from cue versus time from fire	Complete (evaluated risk significant HFEs)
HRA-C1-2	Post-initiator HEP quantifications need to be checked for consistency	Open; Completion of the FPIE items is being tracked in the corrective action program

Table 4-2 ONS Fire PRA NRC Review - Findings

SR	Topic	Status
HRA-E1-1	Address how Alarm Response and EOP/AOPs are followed given a fire	Complete
IEPRA-1	Resolve issues from gap assessment of the ONS PRA revision 3a	In progress; RG 1.200 self-assessment updated Maracor report
IEPRA-2	Demonstrate convergence for selected truncation limit (FPIE issue)	Open; Completion of the FPIE items is being tracked in the corrective action program
IGN-A5-1	Use of reactor year/critical year	ASME Inquiry, or revision to NUREG/CR-6850
MUD-B4-1	Procedure lacks reference to PRA combined standard (draft)	Open; Completion of the FPIE items is being tracked in the corrective action program
MUD-E1-1	Qualify the FRANC computer code for use on FPRA	Open; Completion of the FPIE items is being tracked in the corrective action program
PP-B2-1	Justification for credit of non-rated partition boundaries insufficient	Complete. Partially addressed via multi-compartment analysis. Failure to fully meet SR poses no adverse impact on the analysis quality or completeness.
PP-B3-1	Use of open fire zone boundaries implies credit for spatial separation	Complete. Partially addressed via multi-compartment analysis. Failure to fully meet SR poses no adverse impact on the analysis quality or completeness.
PP-C3-1	Improve general description and identification of unique FP features	Complete. Partially addressed via multi-compartment analysis. Failure to fully meet SR poses no adverse impact on the analysis quality or completeness.
PRM-B1-1	Impact of FPIE peer review open items on FPRA not addressed	Complete (see Section 4.5.1.1)
PRM-D1-1	Circa 2005 fire structure in FPIE model not peer reviewed	Complete; eliminated reliance on initiators from pre-existing fire structure in FPRA.
QLS-A3-1	Discussion in Partitioning & Ignition Frequency calc implied that actions pertaining to 4 structures that were excluded from ignition source counting had not been completed.	Open; no impact on quantification
SF-A2-1	Conduct assessment of the potential for diversion of suppression flow	Open; no impact on quantification
SF-A4-1	Plant seismic response procedures do not cover seismically induced fire	Open; no impact on quantification
SF-A5-1	Assessment of earthquake impact on fire brigade not documented	Open; no impact on quantification

Table 4-2 ONS Fire PRA NRC Review - Findings

SR	Topic	Status
UNC-A1-1	Uncertainty and sensitivity analysis incomplete (not reviewed)	Complete

Most of the findings from the NRC review have either been addressed or deemed to have no impact on FPRA quantification. As required, a corrective action was generated to track completion of the open item. These items either relate to documentation deficiencies or final resolution of technical issues that are not expected to have a negative impact on the FPRA (e.g., breaker coordination and demonstration of convergence for truncation limit).

A limited number of ASME/ANS areas were identified by the NRC review team as meeting Category I only requirements. The capability categories are defined in ANSI/ANS-58.23-2007, "Fire PRA Methodology" (See Figure 4-6). These are listed in Table 4-3 with the planned disposition.

Table 4-3 ONS Fire PRA NRC Review – Category I Summary

SR	Topic	Status
PP-B5	Crediting of active fire barrier elements	Cat 1 is acceptable for the application given that the results are scenario driven (the zone of influence was not arbitrarily limited to the zone boundary).
ES-B4	Number of fire-induced spurious operations considered	Disagree with Category assignment; actually a Cat 3. No limit was placed on the number of fire-induced spurious operations in consideration of potential ISLOCA or containment bypass scenarios.
CS-A10	Identification of cable locations at raceway level (Cat 3) or at compartment level (Cat 2), versus fire area level (Cat 1)	Disagree with Category assignment; actually a Cat 3. While compliance is on an area basis, the FPRA scenarios included identification of targets (including raceways), where applicable.
FSS-C2	Use of time-dependent fire growth profiles	Cat 1 is acceptable for the application. While the results are conservative, insufficient justification exists for application of fire growth profile given the limited credit for suppression taken in the analysis.
FSS-D9	Evaluate potential for smoke damage	Potential for smoke damage to equipment not already failed by fire affects has been added to Fire Scenario Report.
FSS-E3	Statistical analysis of parameters used for modeling fire scenarios	Cat 1 is acceptable for the application; parameters taken from NUREG/CR-6850.

Table 4-3 ONS Fire PRA NRC Review – Category I Summary

SR	Topic	Status
FSS-F2	Establish and justify criteria for structural collapse for selected scenarios	Not applicable; no scenarios were selected (structural steel damage required no further quantitative treatment).
FSS-F3	Quantify risk associated with selected structural collapse scenarios	Not applicable; no scenarios were selected (structural steel damage required no further quantitative treatment).
FSS-H6	Document technical basis for statistical models applied in the analysis	Disagree with Category assignment; actually a Cat 2/3. Conservative scoping fire modeling criteria based on NUREG/CR-6850; no plant specific updates applied. Suggestion FSS-H6-1 considered closed.
QNS-C1	Verify quantitative screening process does not screen high risk fire areas based on 1% (Cat 3) or 10% (Cat 2) CDF/LERF contribution criteria	Not applicable. The screening criteria was not applied; if a building or structure (or an area in the case of the switchyard) contained PRA credited equipment/cables and/or could result in loss of offsite power, it was not screened.

Table 1-1 – Bases for Fire PRA capability categories

Criteria	Capability Category I	Capability Category II	Capability Category III
1. Scope and level of detail The degree to which the scope and level of detail of the plant design, operation, and maintenance are modeled.	Resolution and specificity sufficient to identify the relative importance of the significant contributors at the system or train level, and at a fire area level, including associated human actions as necessary. [Notes (4) and (5)]	Resolution and specificity sufficient to identify the relative importance of the significant contributors at the equipment level, and at a physical analysis unit level, including fire protection program and design elements and associated human actions, as necessary. [Notes (1), (3), (4), and (5)]	Resolution and specificity sufficient to identify the relative importance of the contributors at the equipment level and for specific locations within fire areas or physical analysis units including fire protection program and design elements and associated human actions, as necessary. [Notes (1), (3), (4), and (5)]
2. Plant specificity The degree to which plant-specific information is incorporated such that the as-built and as-operated plant is addressed.	Use of generic data/models acceptable except for the need to account for the unique design and operational features of the plant.	Use of plant-specific data/models for the significant contributors.	Use of plant-specific data/models for all contributors, where available.
3. Realism The degree to which realism is incorporated such that the expected response of the plant is addressed.	Departures from realism will have moderate impact on the conclusions and risk insights as supported by good practices. [Note (2)]	Departures from realism will have small impact on the conclusions and risk insights as supported by good practices. [Note (2)]	Departures from realism will have negligible impact on the conclusions and risk insights as supported by good practices. [Note (2)]

NOTES:

(1) The definition for Capability Categories II and III is not meant to imply that the scope and level of detail include identification of all equipment and human actions, but only those needed for the function of the system being modeled.

(2) Differentiation from moderate, to small, to negligible is determined by the extent to which the impact on the conclusions and risk insights could affect a decision under consideration. This differentiation recognizes that the Fire PRA would generally not be the sole input to a decision. A moderate impact implies that the impact (of the departure from realism) is of sufficient size that it is likely that a decision could be affected; a small impact implies that it is unlikely that a decision could be affected, and a negligible impact implies that a decision would not be affected.

(3) The term "fire protection program and design elements" as used here is intended to broadly encompass fire protection systems, features, and program provisions implemented in support of fire protection defense-in-depth. The term is intended to encompass active systems such as fire detection and suppression systems, passive features such as fire barriers, and programmatic elements such as administrative controls, as well as other aspects of the fire protection program such as the manual fire brigade and postfire safe shutdown.

(4) The terms "fire area" and "physical analysis unit" are defined in Sec. 2.2. Fire areas are defined in the context of regulatory compliance documentation. Physical analysis units are subdivisions of a fire area used for the purposes of the Fire PRA.

(5) The Fire PRA capability categories are distinguished, in part, based on the level of resolution provided in the analysis results. There is a gradation in resolution from fire areas for Capability Category I to specific locations within a fire area or physical analysis unit for Capability Category III. This distinction should not be confused with the task of plant partitioning (see Sec. 4.5). A Capability Category III Fire PRA could, for example, partition the plant at a fire area level and yet resolve fire risk contributions to the level of specific fire scenarios within each fire area. This approach would satisfy the intent of the Capability Category III basis in this regard.

Figure 4-6 Table 1-1 Bases for Fire PRA Capability Categories (ANSI/ANS-58.23.-2007]

4.5.2 NFPA 805 Risk-Informed, Performance-Based Change Evaluation Process

RI-PB Change Evaluations will be completed as part of the ONS NFPA 805 transition. These change evaluations will be used to determine final resolution for accomplishment of performance goals in each fire area. These calculations are under development based upon the requirements of NFPA 805, and industry guidance in NEI 04-02 Revision 1, and RG 1.205, Revision 0. These are summarized in Table 4-4.

Table 4-4 Change Evaluation Guidance Summary Table

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

The Plant Change Evaluation Process consists of the following 4 subtasks and is described in sub-sections 4.5.2.1 through 4.5.2.4:

4.5.2.1 Change Definition

The Change Evaluation process starts with definition of the change or altered condition to be examined, i.e., variance from the deterministic requirements, and the baseline configuration as defined by the LB, i.e., current pre-transition LB.

The ONS pre-transition post-fire safe shutdown analysis revalidation efforts and the NFPA 805 transition project activities have identified a number of variances from the pre-transition fire protection LB. These variances will be addressed by a number of plant and programmatic changes to correct the variances and reduce risk. Following completion of transition activities, planned modifications, and program changes, the plant will be compliant with 10 CFR 50.48(c).

4.5.2.2 Preliminary Risk Review

Although provided in the guidance documents as an option for Change Evaluations, this step was not utilized for the transition process because the variances from the deterministic requirements required risk evaluations.

4.5.2.3 Risk Evaluation

For changes requiring a risk evaluation, the changes are assessed using RI-PB techniques including, but not limited to fire modeling and PRA. The risk evaluations, depending upon the nature of the change, are performed as either limiting or bounding fire modeling/fire risk analyses or detailed integrated analyses.

4.5.2.4 Acceptability Determination

The Change Evaluations are assessed quantitatively for acceptability using the ΔCDF (change in core damage frequency) and ΔLERF (change in large early release frequency) criteria from Section 5.3.5 of NEI 04-02 and RG 1.205. The results of the acceptability determination are documented in calculations. The proposed change must

also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins.

4.5.3 NFPA 805 Risk-Informed, Performance-Based Change Evaluation Results

Results of the Change Evaluations are scheduled to be submitted to the NRC in the supplement to the LAR.

4.5.4 Risk Change Due to NFPA 805 Transition

A discussion of the risk change due to the results of the NFPA 805 Transition will be submitted to the NRC in the supplement to the LAR.

4.6 Monitoring Program

The Monitoring Program will be implemented after the LAR approval as part of the fire protection program transition to NFPA 805. In order to assess the impact of the transition to NFPA 805 on the current monitoring program, the ONS fire protection program documentation such as the maintenance program processes, fire protection program implementing procedures, and plant change processes will be reviewed. Sections 4.5.3 and 5.2 of the NEI 04-02 Implementing Guidance will be used during the review process and that process is described in the following sections.

4.6.1 Overview of NFPA 805 Requirements and NEI 04-02 Guidance on the Existing Monitoring Program

Section 2.6 of NFPA 805 states:

> *"A monitoring program shall be established to ensure that the availability and reliability of the fire protection systems and features are maintained and to assess the performance of the fire protection program in meeting the performance criteria. Monitoring shall ensure that the assumptions in the engineering analysis remain valid"*

The intent of the review will be to confirm (or modify as necessary) the adequacy of the existing surveillance, testing, maintenance, compensatory measures, and oversight processes for transition to NFPA 805. This review will consider the following:

1) The adequacy of the scope of systems and equipment within existing plant programs, i.e., the necessary fire protection systems and features and nuclear safety capability equipment (NFPA 805 Section 1.5.1) are included.
2) The performance criteria for the availability and reliability of fire protection systems and features relied on to demonstrate compliance.
3) The adequacy of the plant corrective action program in determining causes of equipment and programmatic failures and in minimizing their recurrence.

The process and the proposed plan for monitoring program implementation (See section 4.6.2) were discussed with the NRC at the April 2008 Pilot Observation Meeting.

4.6.2 Overview of Post-Transition NFPA 805 Monitoring Program

The following process will be established for monitoring post-transition:

- Determine the scope of SSCs and programmatic elements to monitor.
- Establish levels of availability, reliability, or other criteria for those elements that require monitoring.

A flowchart of the overall process for NFPA 805 monitoring implementation is shown in Figure 4-7. The four main phases of the monitoring process are described as follows:

Phase 1 - Scoping

Phase 1 of the process will determine the scope of the NFPA 805 monitoring program. In order to meet the NFPA 805 requirements for monitoring, three basic categories are established:

- Fire protection systems and features
- Nuclear safety capability equipment (NFPA 805 Section 1.5.1).
- Fire Protection Programmatic Elements
- Key Assumptions in Engineering Analyses (e.g., Change Evaluations, Nuclear Safety Capability Assessment, EEEs)

Phase 2 - Establishing Risk Criteria

Phase 2 of the process will establish risk significant criteria for SSCs and programmatic elements within the NFPA 805 monitoring scope. The Fire PRA is the primary tool used to establish risk significant criteria. Only certain SSCs/fire protection program elements are amenable to risk measurement in Fire PRA.

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. The performance criteria used should be availability, reliability, or condition, as appropriate.

Phase 3 - Risk Determination

Phase 3 will consist of utilizing the Fire PRA, or other processes, as appropriate, to determine the risk significant SSCs/fire protection program elements using the criteria established in Phase 2.

Phase 4 – Monitoring Implementation

Phase 4 is the implementation of the monitoring program, once the scope, and risk criteria are established in previous phases. The implementation includes the assessment of performance against the established criteria. Maintenance of the monitoring program will include refinement of performance goals and criteria, analysis of situations where goals are not met, and addressing items appropriately via the corrective action program.

The fire protection program monitoring scope is not included in the scope of 10 CFR 50.65, Maintenance Rule.

As part of the monitoring program a fire protection assessment (audit) shall be performed in accordance with Duke Energy Carolinas Topical Report, Quality Assurance Program, (Duke-1-A) using an outside qualified fire protection engineer meeting Society of Fire Protection Engineers (SFPE) member grade qualifications.

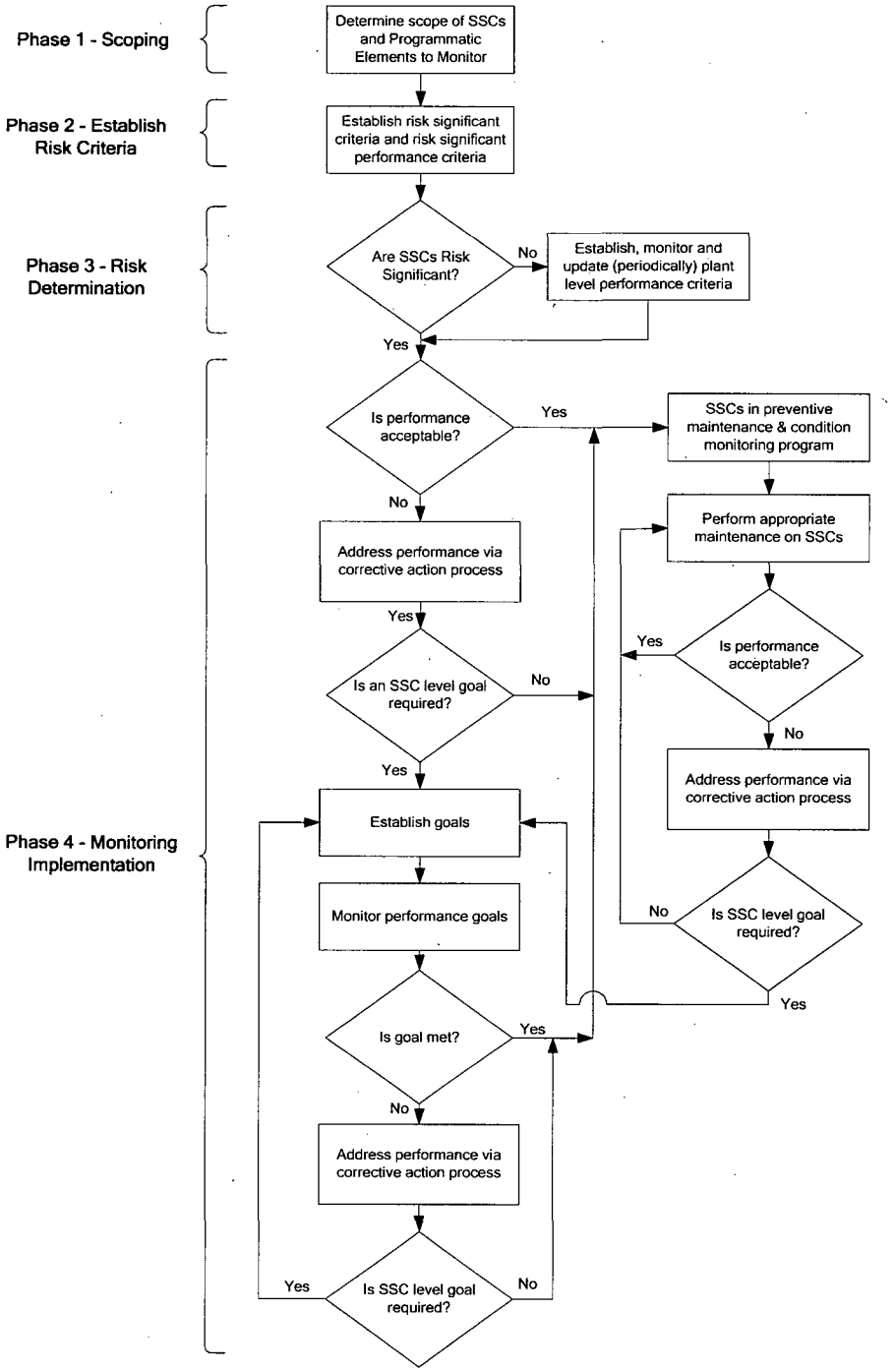


Figure 4-7 – Post-Transition NFPA 805 Monitoring Program

4.7 Program Documentation, Configuration Control, and Quality Assurance

4.7.1 Compliance with Documentation Requirements in Section 2.7.1 of NFPA 805

In accordance with the requirements and guidance in NFPA 805 Section 2.7.1 and NEI 04-02, Revision 1, ONS has documented analyses to support compliance with 10 CFR 50.48(c). The analyses and calculations are being performed in accordance with Duke's processes for ensuring assumptions are clearly defined, that results be easily understood, that results be clearly and consistently described, and that sufficient detail be provided to allow future review of the entire analyses.

Analyses, as defined by NFPA 805 2.4, performed to demonstrate compliance with 10 CFR 50.48(c) will be maintained for the life of the plant and organized to facilitate review for accuracy and adequacy. These analyses do not include items such as periodic tests, hot work permits, fire impairments, etc.

The ONS "Fire Protection Program Design Basis Document" concept described in Section 2.7.1.2 of NFPA 805 and necessary supporting documentation described in Section 2.7.1.3 of NFPA 805 will be revised as part of transition to 10 CFR 50.48(c) to ensure program implementation following receipt of the SER. Appropriate cross references will be established to supporting documents as required by Duke processes.

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

Program documentation established, revised, or utilized in support of compliance with 10 CFR 50.48(c) is subject to Duke configuration control processes that meet the requirements of Section 2.7.2 of NFPA 805. This includes the appropriate procedures and configuration control processes for ensuring that changes impacting the FPP are reviewed for impact.

4.7.3 Compliance with Quality Requirements in Section 2.7.3 of NFPA 805

During the transition to 10 CFR 50.48(c), ONS performed work in accordance with the quality requirements of Section 2.7.3 of NFPA 805. Post-transition quality requirements from NFPA 805 that are not currently part of the Duke processes will be revised to include any additional requirements.

NFPA 805 Section 2.7.3.1 - Review – Analyses, calculations, and evaluations performed in support of compliance with 10 CFR 50.48(c) are performed in accordance with Duke procedures that require independent review.

NFPA 805 Section 2.7.3.2 – Verification and Validation – Calculational models and numerical methods used in support of compliance with 10 CFR 50.48(c) will be verified and validated as required by Section 2.7.3.2 of NFPA 805.

NFPA 805 Section 2.7.3.3 – Limitations of Use - Engineering methods and numerical models used in support of compliance with 10 CFR 50.48(c) were used and will be used appropriately as required by Section 2.7.3.3 of NFPA 805.

NFPA 805 Section 2.7.3.4 – Qualification of Users – Cognizant personnel who use and apply engineering analysis and numerical methods in support of compliance with 10 CFR 50.48(c) are competent and experienced as required by Section 2.7.3.4 of NFPA 805.

NFPA 805 Section 2.7.3.5 – Uncertainty Analysis – Uncertainty analyses are performed as required by 2.7.3.5 of NFPA 805. This is of particular interest in Fire modeling and Fire PRA development.

4.8 Summary of Results

4.8.1 Results of the Fire Area-by-Fire Area Review

A higher level summary is provided in Table 4-5. The table provides the following information from the NEI 04-02 Table B-3:

- Fire Area: Fire Area Identifier.
- Area Description: Fire Area Description.
- NFPA 805 Regulatory Basis (Post-Transition): Post-transition NFPA 805 Chapter 4 reference for the Fire Area (Section 4.2.3 or 4.2.4)
- Change Evaluations: Reference to Change Evaluation (ONS Fire Safety Analysis Calculation), Documentation (Yes/No) of a Change Evaluation for the fire area.
- Suppression Required? (Yes/No): Confirmation of requirement for fire suppression in the Fire Area based on NFPA 805.
  - Systems required to meet Chapter 4 deterministic compliance.
  - Systems required to meet Chapter 4 performance-based compliance including systems credited for defense in depth.
  - High Safety Significant Fire SSCs as determined by the FP monitoring program.
- Detection Required? (Yes/No): Confirmation of requirement for fire detection in the Fire Area on NFPA 805. This includes:
  - Systems required to meet Chapter 4 deterministic compliance.
  - Systems required to meet Chapter 4 performance-based compliance, including systems credited for defense in depth.
  - High Safety Significant Fire SSCs as determined by the FP monitoring program.
- Modifications? (Yes/No): Indication whether or not modifications will be planned for implementation in the Fire Area

Table 4-5 Fire Area Compliance Summary

Fire Area	Area Description	NFPA 805 4.2 NSCA Reg. Basis (Post-Transition)	Change Evaluations (Yes/No)	Suppression Req'd? (Yes/No)	Detection Req'd? (Yes/No)	Modifications[4] (Yes/No)
BH12	Unit 1 & 2 Blockhouse	4.2.3 4.2.4	Yes	Yes	Yes	
BH3	Unit 3 Blockhouse	4.2.3 4.2.4	Yes	Yes	Yes	
BOP	Balance of Plant	4.2.3 4.2.4	Yes	Yes	Yes	
CT4	CT 4 Blockhouse	4.2.3 4.2.4	Yes	No	No	
KEO	Keowee Hydro Station	4.2.3	No	No	No	
RB1	Unit 1 Reactor Building	4.2.3 4.2.4	Yes	No	No	
RB2	Unit 2 Reactor Building	4.2.3 4.2.4	Yes	No	No	
RB3	Unit 3 Reactor Building	4.2.3 4.2.4	Yes	No	No	
SSF	Standby Shutdown Facility	4.2.3 4.2.4	No	No	No	
SYD	230 KV Switchyard	4.2.3	No	No	No	
T100	Cable Trench T-100	TBD	Yes	No	No	
WP1	Unit 1 West Penetration Room	4.2.3 4.2.4	Yes	No	No	
WP2	Unit 2 West Penetration Room	4.2.3 4.2.4	Yes	No	No	
WP3	Unit 3 West Penetration Room	4.2.3 4.2.4	Yes	No	No	

[4] The 'Modifications' column will be populated in the supplement to the LAR

Table 4-5 Fire Area Compliance Summary

Fire Area	Area Description	NFPA 805 4.2 NSCA Reg. Basis (Post-Transition)	Change Evaluations (Yes/No)	Suppression Req'd? (Yes/No)	Detection Req'd? (Yes/No)	Modifications[4] (Yes/No)
Yard	Yard Area	TBD	Yes	No	No	

4.8.2 Supplemental Information – Generic Issue Resolution

4.8.2.1 Fire Induced Multiple Spurious Operations Resolution

NEI 04-02 suggests that a licensee submit a summary of its approach for addressing potential fire-induced MSOs for NRC review and approval. As a minimum, NEI 04-02 suggests that the summary contain sufficient information relevant to methods, tools, and acceptance criteria used to enable the NRC to determine the acceptability of the licensee's methodology. Attachment F contains the methodology that Duke is submitting for NRC approval.

4.8.2.2 Operator Manual Actions – Transition to Recovery Actions

NEI 04-02 suggests that a licensee submit a summary of its approach for addressing the transition of operator manual actions to recovery actions in the LAR. As a minimum, NEI 04-02 suggests that the assumptions, criteria, methodology, and overall results be included for the NRC to determine the acceptability of the licensee's methodology. Attachment G contains a description of this approach.

All of the reviews and analyses necessary to support transition have not been completed. Specifically, the Fire PRAs for ONS Units 1, 2, and 3 to support the RI-PB Change Evaluations per Regulatory Positions C.2.2 and C.4.3 of RG 1.205 have not been completed. Therefore, Fire PRA results, the associated Change Evaluations, and the determination of the additional risk presented by the use of recovery actions as a compliance strategy have not been completed. These tasks are scheduled for completion and the results will be submitted to the NRC in the supplement to the LAR.

4.8.3 Plant Modifications

The modifications necessary to support the new LB will be identified and described in Attachment S (RG 1.205, Revision 0, Regulatory Position C.2.2. and NEI 04-02, Revision 1, Section 4.5.1) in the supplement to the LAR.

5.0 REGULATORY EVALUATION

5.1 Introduction – 10 CFR 50.48

On July 16, 2004 the NRC amended 10 CFR Part 50.48, Fire Protection, to add a new subsection, 10 CFR 50.48(c), which establishes alternative fire protection requirements. 10 CFR 50.48 endorses, with exceptions, the National Fire Protection Association's NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants – 2001 Edition (NFPA 805), as a voluntary alternative for demonstrating compliance with 10 CFR 50.48 Section (b), Appendix R, and Section (f), Decommissioning.

The voluntary adoption of 10 CFR 50.48(c) by ONS does not eliminate the need to comply with 10 CFR 50.48(a) and 10 CFR 50, Appendix A, GDC 3, Fire Protection. The NRC addressed the overall adequacy of the regulations during the promulgation of 10 CFR 50.48(c) (Reference Federal Register Notice 69 FR 33536 dated June 16, 2004, ADAMS Accession No. ML041340086). This was further clarified in FAQ 07-0032, 10 CFR 50.48(a) and GDC 3 clarification (ML081300697).

The following tables provide a cross reference of fire protection regulations associated with the post-transition ONS fire protection program and applicable industry and ONS documents that address the topic.

10 CFR 50.48(a)

Table 5-1 10 CFR 50.48(a) – Applicability/Compliance Reference

10 CFR 50.48(a) Section(s)	Applicability/Compliance Reference
(1) Each holder of an operating license issued under this part or a combined license issued under part 52 of this chapter must have a fire protection plan that satisfies Criterion 3 of appendix A to this part. This fire protection plan must:	See below
(i) Describe the overall fire protection program for the facility	NFPA 805 Section 3.2 ONS NEI 04-02 Table B-1
(ii) Identify the various positions within the licensee's organization that are responsible for the program;	NFPA 805 Section 3.2.2 ONS NEI 04-02 Table B-1
(iii) State the authorities that are delegated to each of these positions to implement those responsibilities; and	NFPA 805 Section 3.2.2 ONS NEI 04-02 Table B-1
(iv) Outline the plans for fire protection, fire detection and suppression capability, and limitation of fire damage	NFPA 805 Section 2.7 and Chapters 3 and 4 ONS NEI 04-02 B-1 and B-3 Tables
(2) The plan must also describe specific features necessary to implement the program described in paragraph (a)(1) of this section such as	See below
(i) Administrative controls and personnel requirements for fire prevention and manual fire suppression activities;	NFPA 805 Sections 3.3.1 and 3.4 ONS NEI 04-02 Table B-1

Table 5-1 10 CFR 50.48(a) – Applicability/Compliance Reference	
10 CFR 50.48(a) Section(s)	**Applicability/Compliance Reference**
(ii) Automatic and manually operated fire detection and suppression systems; and	NFPA 805 Sections 3.5 through 3.10 and Chapter 4 ONS NEI 04-02 B-1 and B-3 Tables
(iii) The means to limit fire damage to structures, systems, or components important to safety so that the capability to shut down the plant safely is ensured.	NFPA 805 Chapter 4 ONS NEI 04-02 B-3 Table
(3) The licensee shall retain the fire protection plan and each change to the plan as a record until the Commission terminates the reactor license. The licensee shall retain each superseded revision of the procedures for 3 years from the date it was superseded.	NFPA 805 Section 2.7.1.1 requires that documentation (Analyses, as defined by NFPA 805 2.4, performed to demonstrate compliance with this standard) be maintained for the life of the plant. [NSD 701 Records Management]
(4) Each applicant for a design approval, design certification, or manufacturing license under part 52 of this chapter must have a description and analysis of the fire protection design features for the standard plant necessary to demonstrate compliance with Criterion 3 of appendix A to this part.	Not applicable to ONS. ONS is licensed under 10 CFR 50.

General Design Criterion 3

As stated in the ONS UFSAR, the principal design criteria for Oconee 1, 2 and 3 were developed in consideration of seventy General Design Criteria for Nuclear Power Plant Construction Permits proposed by the AEC in a proposed rule-making published for 10 CFR Part 50 in the Federal Register of July 11, 1967.

The criteria (were) categorized as Category A or Category B. Experience (had) shown that more definitive information (was) needed at the construction permit stage for the items listed in Category A than for those in Category B. The following is a discussion of Criterion 3, Fire Protection (Category A) from the seventy criteria proposed by the AEC, together with Duke's response indicating its interpretation of an agreement with the intent of the criterion as captured in the ONS UFSAR.

Table 5-2 GDC 3 – Applicability/Compliance Reference

GDC 3, Fire Protection, Statement	ONS Specific Criterion 3	Applicability/Compliance Reference
Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions.	1) to minimize the probability of events such as fires and explosions 2) to minimize the potential effects of such events to safety.	NFPA 805 Chapters 3 and 4 ONS NEI 04-02 B-1 and B-3 Tables
Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room.	Noncombustible and fire-resistant materials shall be used whenever practical throughout the facility, particularly in areas containing critical portions of the facility such as containment, control room, and components of engineered safety features	NFPA 805 Sections 3.3.2, 3.3.3, 3.3.4, 3.11.4 ONS NEI 04-02 B-1 Table
Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety.	Not specifically addressed in ONS UFSAR fire protection Criterion 3 discussion.	NFPA 805 Chapters 3 and 4 ONS NEI 04-02 B-1 and B-3 Tables
Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components	Not specifically addressed in ONS UFSAR fire protection Criterion 3 discussion.	NFPA 805 Sections 3.4 through 3.10 and 4.2.1 ONS NEI 04-02 Table B-3

10 CFR 50.48(c)

Table 5-3 10 CFR 50.48(c) – Applicability/Compliance Reference

10 CFR 50.48(c) Section(s)	Applicability/Compliance Reference
(1) *Approval of incorporation by reference.* National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition" (NFPA 805), which is referenced in this section, was approved for incorporation by reference by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51.	General Information. NFPA 805 (2001 edition) is the edition adopted by Duke for ONS.
(2) Exceptions, modifications, and supplementation of NFPA 805. As used in this section, references to NFPA 805 are to the 2001 Edition, with the following exceptions, modifications, and supplementation:	General Information. NFPA 805 (2001 edition) is the edition adopted by Duke for ONS.
(i) *Life Safety Goal, Objectives, and Criteria.* The Life Safety Goal, Objectives, and Criteria of Chapter 1 are not endorsed.	The Life Safety Goal, Objectives, and Criteria of Chapter 1 of NFPA 805 are not part of the ONS LAR.
(ii) *Plant Damage/Business Interruption Goal, Objectives, and Criteria.* The Plant Damage/Business Interruption Goal, Objectives, and Criteria of Chapter 1 are not endorsed.	The Plant Damage/Business Interruption Goal, Objectives, and Criteria of Chapter 1 of NFPA 805 are not part of the ONS LAR.
(iii) *Use of feed-and-bleed.* In demonstrating compliance with the performance criteria of Sections 1.5.1(b) and (c), a high-pressure charging/injection pump coupled with the pressurizer power-operated relief valves (PORVs) as the sole fire-protected safe shutdown path for maintaining reactor coolant inventory, pressure control, and decay heat removal capability (i.e., feed-and-bleed) for pressurized-water reactors (PWRs) is not permitted.	Feed and bleed is not utilized as the sole fire-protected safe shutdown methodology at ONS.
(iv) Uncertainty analysis. An uncertainty analysis performed in accordance with Section 2.7.3.5 is not required to support deterministic approach calculations.	Uncertainty analysis was not performed for deterministic methodology at ONS.
(v) Existing cables. In lieu of installing cables meeting flame propagation tests as required by Section 3.3.5.3, a flame-retardant coating may be applied to the electric cables, or an automatic fixed fire suppression system may be installed to provide an equivalent level of protection. In addition, the italicized exception to Section 3.3.5.3 is not endorsed.	Electrical cable construction at ONS complies with a flame propagation test that was found acceptable to the NRC as documented in NEI 04-02 Table B-1.
(vi) Water supply and distribution. The italicized exception to Section 3.6.4 is not endorsed. Licensees who wish to use the exception to Section 3.6.4 must submit a request for a license amendment in accordance with paragraph (c)(2)(vii) of this section.	ONS "complies via previous NRC approval" as documented in the NEI 04-02 Table B-1.

Table 5-3 10 CFR 50.48(c) – Applicability/Compliance Reference

10 CFR 50.48(c) Section(s)	Applicability/Compliance Reference
(vii) Performance-based methods. Notwithstanding the prohibition in Section 3.1 against the use of performance-based methods, the fire protection program elements and minimum design requirements of Chapter 3 may be subject to the performance-based methods permitted elsewhere in the standard. Licensees who wish to use performance-based methods for these fire protection program elements and minimum design requirements shall submit a request in the form of an application for license amendment under § 50.90. The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the performance-based approach; (A) Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release; (B) Maintains safety margins; and (C) Maintains fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).	The ONS LAR requests the use of performance-based methods for NFPA 805 Chapter 3 requirements based upon FAQ 06-0008 (ADAMS reference pending). This request is in accordance with 10 CFR 50.48(c)(2)(vii).
(3) *Compliance with NFPA 805.*	See below
(i) A licensee may maintain a fire protection program that complies with NFPA 805 as an alternative to complying with paragraph (b) of this section for plants licensed to operate before January 1, 1979, or the fire protection license conditions for plants licensed to operate after January 1, 1979. The licensee shall submit a request to comply with NFPA 805 in the form of an application for license amendment under § 50.90. The application must identify any orders and license conditions that must be revised or superseded, and contain any necessary revisions to the plant's technical specifications and the bases thereof. The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the licensee has identified orders, license conditions, and the technical specifications that must be revised or superseded, and that any necessary revisions are adequate. Any approval by the Director or the designee must be in the form of a license amendment approving the use of NFPA 805 together with any necessary revisions to the technical specifications.	The ONS LAR was submitted in accordance with 10 CFR 50.90. The LAR included applicable license conditions, orders, technical specifications/bases that needed to be revised and/or superseded.
(ii) 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.	The ONS LAR and transition report summarize the evaluations and analyses performed in accordance with Chapter 2 of NFPA 805.

Table 5-3 10 CFR 50.48(c) – Applicability/Compliance Reference

10 CFR 50.48(c) Section(s)	Applicability/Compliance Reference
(4) Risk-informed or performance-based alternatives to compliance with NFPA 805. A licensee may submit a request to use risk-informed or performance-based alternatives to compliance with NFPA 805. The request must be in the form of an application for license amendment under § 50.90 of this chapter. The Director of the Office of Nuclear Reactor Regulation, or designee of the Director, may approve the application if the Director or designee determines that the proposed alternatives:	No risk-informed or performance-based alternatives to compliance with NFPA 805 (per 10 CFR 50.48(c)(4)) were utilized by ONS.
(i) Satisfy the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release;	Not applicable to ONS.
(ii) Maintain safety margins; and	Not applicable to ONS.
(iii) Maintain fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).	Not applicable to ONS.

5.2 Regulatory Topics

5.2.1 License Condition Changes

The current ONS fire protection license condition 3.D is being replaced with the standard license condition in Regulatory Position C.3.1 of RG 1.205, Revision 0, as modified by FAQ 06-0008, as shown in Attachment M.

5.2.2 Technical Specifications

ONS conducted a review of the Technical Specifications to determine which Technical Specifications are required to be revised, deleted, or superseded. ONS determined that the changes to the Technical Specifications and applicable justification listed in Attachment N are adequate for the ONS adoption of the new fire protection LB. Enclosures 3 and 4 contain the mark-up and re-typed copies of the Facility Operating License, Technical Specifications, and Technical Specification Bases.

5.2.3 Orders and Exemptions

A review was conducted of the ONS docketed correspondence to determine if there were any orders or exemptions that needed to be superseded or revised. A review was also performed to ensure that compliance with the physical protection requirements, security orders, and adherence to those commitments applicable to the plant are maintained. A discussion of affected orders and exemptions is included in Attachment O.

5.3 Regulatory Evaluations

5.3.1 No Significant Hazards Consideration

Pursuant to 10 CFR 50.91, Duke has made the determination that this amendment request involves a "No Significant Hazards Consideration" by applying the standards established by the NRC regulations in 10 CFR 50.92. This amendment does not involve a significant hazards consideration for the following reasons:

To the extent that these conclusions apply to compliance with the requirements in NFPA 805, these conclusions are based on the following NRC statements in the Statements of Consideration accompanying the adoption of alternative fire protection requirements based on NFPA 805.

1) Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

Operation of Oconee Nuclear Station (ONS) in accordance with the proposed amendment does not increase the probability or consequences of accidents previously evaluated. The Updated Final Safety Analysis Report (UFSAR) documents the analyses of design basis accident (DBA) at ONS. The applicable accidents associated with this license amendment request (LAR) are fires. The proposed amendment does not adversely affect accident initiators nor alter design assumptions, conditions, or configurations of the facility and does not adversely affect the ability of structures, systems, and components (SSCs) to perform their design function. SSCs required to safely shut down the reactor and to maintain it in a safe shutdown (SSD) condition will remain capable of performing their design functions.

The purpose of this amendment is to permit ONS to adopt a new fire protection licensing basis (LB) which complies with the requirements in 10 CFR 50.48(a) and (c) and the guidance in Revision 0 of Regulatory Guide (RG) 1.205. The NRC considers that National Fire Protection Association (NFPA) 805 provides an acceptable methodology and performance criteria for licensees to identify fire protection systems and features that are an acceptable alternative to the Appendix R fire protection features (69 FR 33536, June 16, 2004). Engineering analyses, which may include engineering evaluations, probabilistic safety assessments, and fire modeling calculations, have been performed to demonstrate that the risk-informed, performance-based (RI-PB) requirements per NFPA 805 have been met.

NFPA 805, taken as a whole, provides an acceptable alternative to 10 CFR 50.48(b) and satisfies 10 CFR 50.48(a) and General Design Criterion (GDC) 3 of Appendix A to 10 CFR Part 50, meets the underlying intent of the NRC's existing fire protection regulations and guidance, and achieves defense-in-depth and the goals, performance objectives, and performance criteria specified in Chapter 1 of the standard and, if there are any increases in core

damage frequency (CDF) or risk, the increase will be small and consistent with the intent of the Commission's Safety Goal Policy.

Based on this, the implementation of this amendment does not significantly increase the probability of any accident previously evaluated. Equipment required to mitigate an accident remains capable of performing the assumed function. Therefore, the consequences of any accident previously evaluated are not significantly increased with the implementation of this amendment.

2) Does the proposed amendment create the possibility of a new or different kind of accident from any kind of accident previously evaluated?

Response: No.

Operation of ONS in accordance with the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated. Any scenario or previously analyzed accident with offsite dose was included in the evaluation of DBAs documented in the UFSAR. The proposed change does not alter the requirements or function for systems required during accident conditions. Implementation of the new fire protection LB which complies with the requirements in 10 CFR 50.48(a) and (c) and the guidance in Revision 0 of RG 1.205 will not result in new or different accidents.

The proposed amendment does not adversely affect accident initiators nor alter design assumptions, conditions, or configurations of the facility. The proposed amendment does not adversely affect the ability of SSCs to perform their design function. SSCs required to safely shut down the reactor and maintain it in a safe shutdown condition remain capable of performing their design functions.

The purpose of this amendment is to permit ONS to adopt a new fire protection LB which complies with the requirements in 10 CFR 50.48(a) and (c) and the guidance in Revision 0 of RG 1.205. The NRC considers that NFPA 805 provides an acceptable methodology and performance criteria for licensees to identify fire protection systems and features that are an acceptable alternative to the Appendix R fire protection features (69 FR 33536, June 16, 2004).

The requirements in NFPA 805 address only fire protection and the impacts of fire on the plant have already been evaluated. Based on this, the implementation of this amendment does not create the possibility of a new of different kind of accident from any kind of accident previously evaluated. The proposed changes do not involve new failure mechanisms or malfunctions that can initiate a new accident. Therefore, the possibility of a new or different kind of accident from any kind of accident previously evaluated is not created with the implementation of this amendment.

3) Does the proposed amendment involve a significant reduction in the margin of safety?

Response: No.

Operation of ONS in accordance with the proposed amendment does not involve a significant reduction in the margin of safety. The proposed amendment does not alter the manner in which safety limits, limiting safety system settings or limiting conditions for operation are determined. The safety analysis acceptance criteria are not affected by this change. The proposed amendment does not adversely affect existing plant safety margins or the reliability of equipment assumed to mitigate accidents in the UFSAR. The proposed amendment does not adversely affect the ability of SSCs to perform their design function. SSCs required to safely shut down the reactor and to maintain it in a safe shutdown condition remain capable of performing their design functions.

The purpose of this amendment is to permit ONS to adopt a new fire protection LB which complies with the requirements in 10 CFR 50.48(a) and (c) and the guidance in Revision 0 of RG 1.205. The NRC considers that NFPA 805 provides an acceptable methodology and performance criteria for licensees to identify fire protection systems and features that are an acceptable alternative to the Appendix R fire protection features (69 FR 33536, June 16, 2004). Engineering analyses, which may include engineering evaluations, probabilistic safety assessments, and fire modeling calculations, have been performed to demonstrate that the performance-based methods do not result in a significant reduction in the margin of safety.

Based on this, the implementation of this amendment does not significantly reduce the margin of safety. The proposed changes are evaluated to ensure that risk and safety margins are kept within acceptable limits. Therefore, the transition does not involve a significant reduction in the margin of safety.

NFPA 805 continues to protect public health and safety and the common defense and security because the overall approach of NFPA 805 is consistent with the key principles for evaluating license basis changes, as described in RG 1.174, is consistent with the defense-in-depth philosophy, and maintains sufficient safety margins.

Margins previously established for the ONS fire protection program in accordance with 10 CFR 50.48(b) and Appendix R to 10 CFR 50 are not significantly reduced. Therefore, this LAR does not result in a reduction in a margin of safety.

5.3.2 Environmental Consideration

Duke has evaluated this LAR against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. Duke has determined that this LAR meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR 50.

The purpose of this amendment is to permit ONS to adopt a new fire protection LB which complies with the requirements in 10 CFR 50.48(a) and (c) and the guidance in Revision 0 of RG 1.205. The NRC considers that NFPA 805 provides an acceptable

methodology and performance criteria for licensees to identify fire protection requirements that are an acceptable alternative to the Appendix R fire protection features (69 FR 33536, June 16, 2004).

The requirements in NFPA 805 address only fire protection and the impacts of fire on the plant have already been evaluated, as part of compliance to 10 CFR 50.48(a) and (b).

This amendment meets the following specific criteria.

(i) The amendment involves no significant hazards consideration

As stated in Section 5.3.1, this proposed amendment does not involve significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

Transition to the NFPA 805 fire protection requirements does not impact effluents. Therefore, there will be no significant change in the types or significant increase in the amounts of any effluents released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

Compliance with NFPA 805 requirements concerning radioactive release due to suppression effects during a fire is documented in Attachment E. There will be no significant increase in individual or cumulative occupational radiation exposure resulting from this change.

Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)9. Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in conjunction with the proposed amendment.

5.4 Supplemental LAR Submittal

The following activities shall be completed to support the supplement to the LAR:

- The MSO treatment, Change Evaluations and the determination of the additional risk presented by the use of recovery actions as a compliance strategy shall be submitted.
- The Unit 1 Fire PRA screening analysis shall be performed.
- The Unit 2 Fire PRA shall be completed.
- The modifications necessary to support the new LB shall be identified.
- An UFSAR example shall be submitted.
- The NPO Modes transition evaluation shall be completed.
- A schedule for the completion of the transition to the new fire protection LB

Enclosure 5 of the submittal provides an overall summary of the open items contained in the various tables and sections of this TR. The majority of these items result from the Chapter 4 reviews. These issues repeat across multiple fire areas and include all three Units. A total of approximately 450 Open Items are summarized in Enclosure 5 with a reference to where in the TR the details for each item are described. The summary of open items in general includes: 1) items which are variances from the deterministic requirements of NFPA 805 for which change evaluations will be performed, 2) additional analyses required in support of the transition reviews, and 3) implementation activities required following receipt of an SER.

Attachments

A. NEI 04-02 Table B-1 Transition of Fundamental FP Program & Design Elements

77 Pages Attached

Attachment A – NEI 04-02 Table B-1 Transition of Fundament FP Program & Design Elements

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.1 General	3.1* General. This chapter contains the fundamental elements of the fire protection program and specifies the minimum design requirements for fire protection systems and features. These fire protection program elements and minimum design requirements shall not be subject to the performance-based methods permitted elsewhere in this standard. Previously approved alternatives from the fundamental protection program attributes of this chapter by the AHJ take precedence over the requirements contained herein.	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		
3.2 Fire Protection Plan	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		
3.2.1 Intent	3.2.1 Intent. A site-wide fire protection plan shall be established. This plan shall document management policy and program direction and shall define the responsibilities of those individuals responsible for the plan's implementation. This section establishes the criteria for an integrated combination of components, procedures, and personnel to implement all fire protection program activities.	Comply	A site-wide Fire Protection Plan has been established. The ONS Fire Protection Program is documented in the Design Basis Specification for Fire Protection.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 1978-01-16 Letter to NRC, FRAQUA Response, 1/16/1978 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 1976-12-31 Letter to NRC, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 12/31/1976	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.2.2 Management Policy Direction and Responsibility.	3.2.2* Management Policy Direction and Responsibility. A policy document shall be prepared that defines management authority and responsibilities and establishes the general policy for the site fire protection program.	Comply	A policy document has been developed. The ONS Fire Protection Program policy is documented in the Design Basis Specification for Fire Protection.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
3.2.2.1 [Management Policy on Senior Management]	3.2.2.1* The policy document shall designate the senior management position with immediate authority and responsibility for the fire protection program.	Comply	The Site Vice President is documented as responsible for the implementation of the fire protection program.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
3.2.2.2 [Management Policy on Daily Administration]	3.2.2.2* The policy document shall designate a position responsible for the daily administration and coordination of the fire protection program and its implementation.	Comply	The Fire Protection Engineer is responsible for the administration of the fire protection program.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
3.2.2.3 [Management Policy on Interfaces]	3.2.2.3* The policy document shall define the fire protection interfaces with other organizations and assign responsibilities for the coordination of activities. In addition, this policy document shall identify the various plant positions having the authority for implementing the various areas of the fire protection program.	Comply	The interfaces between the fire protection program and other organizations and fire protection programs are documented in the Design Specification for Fire Protection.	Engineering Support Program Document for Fire Protection, Rev. 4, 5/9/2005 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.2.2.4 [Management Policy on AHJ]	3.2.2.4* The policy document shall identify the appropriate AHJ for the various areas of the fire protection program.	Further Action Required	The NRC is the considered AHJ for fire protection changes requiring approval. The NRC is notified of changes to the Fire Protection Program in accordance with NSD-320. NSD-320 screens changes to the Fire Protection Program to determine if NRC approval is required. Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to include the NRC as the authority having jurisdiction for fire protection changes requiring approval.	NSD-320, Guidance for Performing Licensing Review of Proposed Changes to the Fire Protection Program, Rev. 0	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.2.2.4	Revise the Design Basis Specification for Fire Protection which is the primary fire protection program policy document to state the NRC is the AHJ for fire protection changes requiring approval.		Open	4/24/2008

Corrective Action Reference: PIP 0-08-2163

Include in LAR/TR: Yes

Change Eval / Mod Reference:

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.2.3 Procedures	3.2.3* Procedures. Procedures shall be established for implementation of the fire protection program. In addition to procedures that could be required by other sections of the standard, the procedures to accomplish the following shall be established: (1) * Inspection, testing, and maintenance for fire protection systems and features credited by the fire protection program (2) * Compensatory actions implemented when fire protection systems and other systems credited by the fire protection program and this standard cannot perform their intended function and limits on impairment duration (3) * Reviews of fire protection program - related performance and trends (4) Reviews of physical plant modifications and procedure changes for impact on the fire protection program (5) Long-term maintenance and configuration of the fire protection program (6) Emergency response procedures for the plant industrial fire brigade	Comply	Procedures have been established for implementing the fire protection program. (1) The Engineering Support Document for Fire Protection provides a detailed listing of applicable surveillance procedures. (2) Compensatory actions have been established. (3) Fire protection program reviews are performed. (4) Plant modification reviews for impact on the fire protection program are performed. (5) Long term maintenance and configuration procedures for the fire protection program have been established. (6) Emergency response procedures for the plant fire brigade are documented.	SLC 16.9.4, 1/30/2000 NSD-316, Fire Protection Impairment and Surveillance, Rev. 6 SLC 16.9.6, 12/14/2004 SLC 16.9.5, 1/30/2000 SLC 16.9.1 S.D. 3.2.14, Fire Protection Program Compensatory Measures Process, Rev. 0, 4/15/2004 RP/O/B/1000/029, Fire Brigade Response, Rev. 11 Oconee Nuclear Site Fire Plan OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated May 23, 2000, 5/23/2000 NSD-106, Configuration Management, Rev. 4 SLC 16.9.3, 1/14/2004 Engineering Support Program Document for Fire Protection, Rev. 4, 5/9/2005 NSD-301, Engineering Change Program, Rev. 27 NSD-228, Applicability Determination, Rev. 3 EDM-601, Engineering Change Manual, Rev. 2, 8/8/2006 EDM-201, Engineering Support Program NSD-112, Fire Brigade Organization, Training & Responsibilities, Rev. 7 SLC 16.9.2, 6/28/2005	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3 Prevention	3.3 Prevention. A fire prevention program with the goal of preventing a fire from starting shall be established, documented, and implemented as part of the fire protection program. The two basic components of the fire prevention program shall consist of both of the following: (1) Prevention of fires and fire spread by controls on operational activities (2) Design controls that restrict the use of combustible materials The design control requirements listed in the remainder of this section shall be provided as described.	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		
3.3.1 Fire Prevention for Operational Activities.	3.3.1 Fire Prevention for Operational Activities. The fire prevention program activities shall consist of the necessary elements to address the control of ignition sources and the use of transient combustible materials during all aspects of plant operations. The fire prevention program shall focus on the human and programmatic elements necessary to prevent fires from starting or, should a fire start, to keep the fire as small as possible.	Comply	Fire prevention program, activities for control of ignition sources and transient combustibles include training, inspections and administrative controls.	NSD-316, Fire Protection Impairment and Surveillance, Rev. 6 NSD-104, Housekeeping, Materiel Condition, and Foreign Material Exclusion, Rev. 27 NSD-314, Hot Work Authorization, Rev. 6 NSD-313, Control of Flammable and Combustible Materials, Rev. 6 General Employee Training - Plant Access Training	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.1.1 General Fire Prevention Activities.	3.3.1.1 General Fire Prevention Activities. The fire prevention activities shall include but not be limited to the following program elements: (1) Training on fire safety information for all employees and contractors including, as a minimum, familiarization with plant fire prevention procedures, fire reporting, and plant emergency alarms. (2) * Documented plant inspections including provisions for corrective actions for conditions where unanalyzed fire hazards are identified. (3) * Administrative controls addressing the review of plant modifications and maintenance to ensure that both fire hazards and the impact on plant fire protection systems and features are minimized.	Comply	The prevention of fires and fire spread are managed through training of personnel, documented plant inspections, and administrative controls.	NSD-313, Control of Flammable and Combustible Materials, Rev. 6 Engineering Support Program Document for Fire Protection, Rev. 4, 5/9/2005 NSD-301, Engineering Change Program, Rev. 27 NSD-228, Applicability Determination, Rev. 3 General Employee Training - Plant Access Training NSD-314, Hot Work Authorization, Rev. 6 EDM-601, Engineering Change Manual, Rev. 2, 8/8/2006 EM 4.6, Oconee Engineering Support Program Walkdowns, Rev. 6, 7/1/2005 NSD-316, Fire Protection Impairment and Surveillance, Rev. 6 NSD-320, Guidance for Performing Licensing Review of Proposed Changes to the Fire Protection Program, Rev. 0	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.1.2 Control of Combustible Materials	3.3.1.2* Control of Combustible Materials. 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: (1) * Wood used within the power block shall be listed pressure-impregnated or coated with a listed fire-retardant application. Exception: Cribbing timbers 6 in. by 6 in. (15.2 cm by 15.2 cm) or larger shall not be required to be fire-retardant treated. (2) Plastic sheeting materials used in the power block shall be fire-retardant types that have passed NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films, large-scale tests, or equivalent. (3) Waste, debris, scrap, packing materials, or other combustibles shall be removed from an area immediately following the completion of work or at the end of the shift, whichever comes first. (4) * Combustible storage or staging areas shall be designated, and limits shall be established on the types and quantities of stored materials. (5) * 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. (6) * Controls on use and storage of flammable gases shall be in accordance with applicable NFPA standards.	Comply	Sections 3.3.1.2(2) through 3.3.1.2(6) - Specific administrative directives have been developed for control of combustible materials.	NSD-313, Control of Flammable and Combustible Materials, Rev. 6 NSD-104, Housekeeping, Materiel Condition, and Foreign Material Exclusion, Rev. 27 EWP 7.2, Storing Chemicals, Rev. 2, 9/30/2003	
		Submit For NRC Approval	NFPA 805 Section 3.3.1.2(1): NSD-313 permits non treated wood for concrete forming and where specified in design drawings.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.1.2	Revise NSD-313 to specifically address plastic sheeting materials shall conform to NFPA 701 requirements, or equivalent (Section 3.3.1.2(2)).		Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163			

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
Include in LAR/TR	No				
Change Eval / Mod Reference					
3.3.1.3 Control of Ignition Sources	3.3.1.3 Control of Ignition Sources				
3.3.1.3.1 [Control of Ignition Sources Code Requirements]	3.3.1.3.1* 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.	Comply	Hot work is controlled through administrative directives in accordance with NFPA 51B. Note NFPA 241 references NFPA 51B with regards to the requirements for administration of Hot Work	NSD-314, Hot Work Authorization, Rev. 6	
Open Item ID	**Open Item Description**		**Disposition**	**Open/Closed**	**Date Entered**
3.3.1.3.1	Evaluate NSD-314 to determine if NFPA 241 should be included.			Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163				
Include in LAR/TR	No				
Change Eval / Mod Reference					

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.1.3.2 [Control of Ignition Sources on Smoking Limitations]	3.3.1.3.2 Smoking and other possible sources of ignition shall be restricted to properly designated and supervised safe areas of the plant.	Comply	Smoking is restricted to approved locations and other sources of ignition are controlled.	NSD-104, Housekeeping, Materiel Condition, and Foreign Material Exclusion, Rev. 27 NSD-314, Hot Work Authorization, Rev. 6	
3.3.1.3.3 [Control of Ignition Sources for Leak Testing]	3.3.1.3.3 Open flames or combustion-generated smoke shall not be permitted for leak or air flow testing.	Further Action Required	Open flame or combustion-generated smoke is prohibited for use in leak and air flow testing. Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to revise procedures to preclude use of open flame or combustion generated smoke for leak and air flow testing.	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.1.3.3	Revise procedures to preclude use of open flame or combustion generated smoke for leak and air flow testing.		Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163			
Include in LAR/TR	Yes			
Change Eval / Mod Reference				

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.1.3.4 [Control of Ignition Sources on Portable Heaters]	3.3.1.3.4* Plant administrative procedure shall control the use of portable electrical heaters in the plant. Portable fuel-fired heaters shall not be permitted in plant areas containing equipment important to nuclear safety or where there is a potential for radiological releases resulting from a fire.	Submit For NRC Approval	The use of portable heaters is controlled by administrative directives. Gas and oil-fired heaters are permitted per station procedures.	NSD-316, Fire Protection Impairment and Surveillance, Rev. 6 S.D. 3.2.14, Fire Protection Program Compensatory Measures Process, Rev. 0, 4/15/2004	
3.3.2 Structural.	3.3.2 Structural. Walls, floors, and components required to maintain structural integrity shall be of noncombustible construction, as defined in NFPA 220, Standard on Types of Building Construction.	Comply	Power production buildings are constructed of non-combustible materials.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.3 Interior Finishes	3.3.3 Interior Finishes. Interior wall or ceiling finish classification shall be in accordance with NFPA 101®, Life Safety Code®, requirements for Class A materials. Interior floor finishes shall be in accordance with NFPA 101 requirements for Class I interior floor finishes.	Further Action Required	Interior finishes are non-combustible. Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to include the specifications for Class A walls/ceilings and Class I floor finishes.	UFSAR Section 9.5.1.4.1, 12/31/2005 NSD-318, Coatings Program, Rev. 2 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.3	Revise NSD-318 to include the specifications for Class A walls/ceilings and Class I floor finishes or include in an alternative administrative control document.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

3.3.4 Insulation Materials	3.3.4 Insulation Materials. Thermal insulation materials, radiation shielding materials, ventilation duct materials, and soundproofing materials shall be noncombustible or limited combustible.	Comply	Thermal insulation materials are non-combustible or limited combustible.	OSS-241.00-00-0004, Conventional Thermal Insulation, Rev. 5, 10/24/2000 OSS-241.00-00-0002, Reactor Building and Piping Heat Insulation (Metal Reflective Type), Rev. 4, 10/1/2003 EDM-601, Engineering Change Manual, Rev. 2, 8/8/2006	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.5 Electrical.	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		
3.3.5.1 [Electrical Wiring Above Suspended Ceiling Limitations]	3.3.5.1 Wiring above suspended ceiling shall be kept to a minimum. Where installed, electrical wiring shall be listed for plenum use, routed in armored cable, routed in metallic conduit, or routed in cable trays with solid metal top and bottom covers.	Further Action Required	Combustibles in concealed spaces are minimized. Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to include clear guidance that electrical wiring (including data/phone/video cabling) if installed above suspended ceilings will comply with the requirement of this section.	UFSAR Section 9.5.1.4.1, 12/31/2005 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 UFSAR Section 9.5.1.4.3	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.5.1	Include clear documentation that electrical wiring (including data/phone/video cabling) is installed above suspended ceilings the wiring complies with this section.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.5.2 [Electrical Raceway Construction Limits]	3.3.5.2 Only metal tray and metal conduits shall be used for electrical raceways. Thin wall metallic tubing shall not be used for power, instrumentation, or control cables. Flexible metallic conduits shall only be used in short lengths to connect components.	Further Action Required	Cable trays are constructed of non-combustible materials. Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to include clear guidance that conduits used for electrical raceways are metal and thin walled metallic tubing is not used in accordance with this section.	Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 UFSAR Section 9.5.1.4.3	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.5.2	Include clear documentation that conduits used for electrical raceways are metal and thin walled metallic tubing is not used in accordance with this section.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.5.3 [Electrical Cable Flame Propagation Limits]	3.3.5.3* Electric cable construction shall comply with a flame propagation test as acceptable to the AHJ. Exception: Existing cable in place prior to the adoption of this standard shall be permitted to remain as it is.	Complies by Previous NRC Approval	The installed wiring has been found acceptable. The NRC August 11, 1978 SER Section 4.8 states "The cable insulation used in the plant consists of armored ethylene propylene rubber (EPR) of 5-8 KV cables with a polyvinyl chloride (PVC) jacket, armored EPR with hypalon or neoprene jacket outside containment and armored EPR with hypalon jacket, some with a PVC jacket overall, for inside containment. The majority of cables at Oconee are of the metallic armored type. The IEEE standard was not in effect at the time the plant was constructed and therefore the cables were not required to meet IEEE 383. The licensee has stated, however, that the same cable construction has since been used at a later plant where the IEEE 383-1971 criteria were imposed and the cable was acceptable. We find that to retest the IEEE 383 procedure and criteria is unnecessary and would not provide information that would alter our recommendation or conclusions. Accordingly we find the electrical cables used at the Oconee Nuclear Station acceptable."	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	
		Further Action Required	Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to document that non-rated cables (including data/phone/video) shall not be routed in cable trays with nuclear safety related cables.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.5.3	Revise station documentation that non-rated cables (including data/phone/video) shall not be routed in cable trays with nuclear safety related cables.			Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163				
Include in LAR/TR	Yes				
Change Eval / Mod Reference					
3.3.6 Roofs.	3.3.6 Roofs. Metal roof deck construction shall be designed and installed so the roofing system will not sustain a self-propagating fire on the underside of the deck when the deck is heated by a fire inside the building. Roof coverings shall be Class A as determined by tests described in NFPA 256, Standard Methods of Fire Tests of Roof Coverings.	Comply	Roofs comply with Class A requirements. A roof management program has been implemented requiring Class A equivalent roof installations.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 Duke Corporate Roof Management Program	
3.3.7 Bulk Flammable Gas Storage.	3.3.7 Bulk Flammable Gas Storage. Bulk compressed or cryogenic flammable gas storage shall not be permitted inside structures housing systems, equipment, or components important to nuclear safety.	Comply	Bulk gas is not stored in areas with equipment important to nuclear safety. Storage of flammable gases are controlled by plant directives.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 EWP 7.2, Storing Chemicals, Rev. 2, 9/30/2003 UFSAR Section 9.5.1.4.3 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 NSD-116, Nuclear Chemical Control Program, Rev. 2	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.7.1 [Bulk Flammable Gas Location Requirements]	3.3.7.1 Storage of flammable gas shall be located outdoors, or in separate detached buildings, so that a fire or explosion will not adversely impact systems, equipment, or components important to nuclear safety. NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites, shall be followed for hydrogen storage.	Comply	Bulk gas is not stored in areas important to nuclear safety.	NSD-116, Nuclear Chemical Control Program, Rev. 2 NSD-313, Control of Flammable and Combustible Materials, Rev. 6	
		Further Action Required	Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to perform an NFPA 50A code compliance review for the outdoor hydrogen storage.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.7.1	Perform a code compliance review for the outdoor hydrogen storage per NFPA 50A.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.7.2 [Bulk Flammable Gas Container Restrictions]	3.3.7.2 Outdoor high-pressure flammable gas storage containers shall be located so that the long axis is not pointed at buildings.	Comply	Hydrogen gas tanks are orientated with the long axis parallel to plant buildings.	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 UFSAR Section 9.5.1.4.3 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NSD-116, Nuclear Chemical Control Program, Rev. 2 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	
		Further Action Required	Resolve orientation of propane tank. The tank is not anchored per the SER recommendation. Evaluate if the previous approval by the NRC is sufficient with modification. Alternatively, determine if an evaluation is required or modify the tank position		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.7.2	Resolve orientation of propane tank. The tank is not anchored per the SER recommendation. Evaluate if the previous approval by the NRC is sufficient with modification. Alternatively, determine if an evaluation is required or modify the tank position		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.7.3 [Bulk Flammable Gas Cylinder Limitations]	3.3.7.3 Flammable gas storage cylinders not required for normal operation shall be isolated from the system.	Comply	Gas cylinders are isolated when not in use and controlled by plant directives.	EWP 7.2, Storing Chemicals, Rev. 2, 9/30/2003 NSD-313, Control of Flammable and Combustible Materials, Rev. 6	
3.3.8 Bulk Storage of Flammable and Combustible Liquids.	3.3.8 Bulk Storage of Flammable and Combustible Liquids. Bulk storage of flammable and combustible liquids shall not be permitted inside structures containing systems, equipment, or components important to nuclear safety. As a minimum, storage and use shall comply with NFPA 30, Flammable and Combustible Liquids Code.	Further Action Required	The storage of combustible and flammable materials is controlled by plant directives. Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to perform a NFPA 30 code compliance review for the Turbine Building lube oil reservoirs, Turbine Building oil storage building and the Keowee lube oil tank room.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.8	Perform a NFPA 30 code review for the Turbine Building lube oil reservoirs, Turbine Building oil storage building and the Keowee lube oil tank room.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.9 Transformers.	3.3.9* Transformers. Where provided, transformer oil collection basins and drain paths shall be periodically inspected to ensure that they are free of debris and capable of performing their design function.	Further Action Required	Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to include drainage inspections as part of the annual flow tests.	Engineering Support Program Document for Fire Protection, Rev. 4, 5/9/2005 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.9	Revise station test procedures to include drainage inspections as part of the annual flow tests		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.10 Hot Pipes and Surfaces.	3.3.10* Hot Pipes and Surfaces. Combustible liquids, including high flashpoint lubricating oils, shall be kept from coming in contact with hot pipes and surfaces, including insulated pipes and surfaces. Administrative controls shall require the prompt cleanup of oil on insulation.	Comply	Administrative directives ensure the prompt identification and correction of any oil leakage.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.10	Revise NSD-104 and/or NSD-413 to clearly indicate it is a NRC requirement to promptly remove oil from insulation.		Open	5/8/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	No
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.11 Electrical Equipment	3.3.11 Electrical Equipment Adequate clearance, free of combustible material, shall be maintained around energized electrical equipment.	Comply	Administrative directives control combustible material near electrical equipment.	NSD-104, Housekeeping, Materiel Condition, and Foreign Material Exclusion, Rev. 27 NSD-313, Control of Flammable and Combustible Materials, Rev. 6	
		Further Action Required	Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to specify the combustible free distances consistent with the PRA Zone Of Influence for transients and change evaluation results.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.11	Revise NSD-313 to specify the combustible free distances consistent with the PRA Zone Of Influence for transients and change evaluation results.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.3.12 Reactor Coolant Pumps.	3.3.12* Reactor Coolant Pumps. For facilities with non-inerted containments, reactor coolant pumps with an external lubrication system shall be provided with an oil collection system. The oil collection system shall be designed and installed such that leakage from the oil system is safely contained for off normal conditions such as accident conditions or earthquakes. All of the following shall apply. (1) The oil collection system for each reactor coolant pump shall be capable of collecting lubricating oil from all potential pressurized and nonpressurized leakage sites in each reactor coolant pump oil system. (2) Leakage shall be collected and drained to a vented closed container that can hold the inventory of the reactor coolant pump lubricating oil system. (3) A flame arrestor is required in the vent if the flash point characteristics of the oil present the hazard of a fire flashback. (4) Leakage points on a reactor coolant pump motor to be protected shall include but not be limited to the lift pump and piping, overflow lines, oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and the oil reservoirs, where such features exist on the reactor coolant pumps. (5) The collection basin drain line to the collection tank shall be large enough to accommodate the largest potential oil leak such that oil leakage does not overflow the basin.	Comply	The RCP oil collection system meets the five criteria presented in this section.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 1981-03-18 Letter to NRC, Plan for App R Improvements & Requested Change to License Condition, 3/18/1981 PIP O-99-2532/LER 270/1999-04, Duke to NRC dated February 16, 2000, 2/16/2000 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	
3.4 Industrial Fire Brigade.	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.4.1 On-Site Fire-Fighting Capability.	3.4.1 On-Site Fire-Fighting Capability. All of the following requirements shall apply. (a) A fully staffed, trained, and equipped fire-fighting force shall be available at all times to control and extinguish all fires on site. This force shall have a minimum complement of five persons on duty and shall conform with the following NFPA standards as applicable: (1) NFPA 600, Standard on Industrial Fire Brigades (interior structural fire fighting) (2) NFPA 1500, Standard on Fire Department Occupational Safety and Health Program (3) NFPA 1582, Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians (b) * Industrial fire brigade members shall have no other assigned normal plant duties that would prevent immediate response to a fire or other emergency as required. (c) During every shift, the brigade leader and at least two brigade members shall have sufficient training and knowledge of nuclear safety systems to understand the effects of fire and fire suppressants on nuclear safety performance Exception: Sufficient training and knowledge shall be permitted to be provided by an operations advisor dedicated to industrial fire brigade support criteria. (d) * The industrial fire brigade shall be notified immediately upon verification of a fire. (e) Each industrial fire brigade member shall pass an annual physical examination to determine that he or she can perform the strenuous activity required during manual fire-fighting operations. The physical examination shall determine the ability of each member to use respiratory protection equipment.	Comply	The onsite Fire Brigade is appropriately staffed, trained and equipped.	General Employee Training - Plant Access Training ERTG-001, Emergency Response Organization and Emergency Services Training Program RP/O/B/1000/029, Fire Brigade Response, Rev. 11 SLC 16.13.1 NSD-112, Fire Brigade Organization, Training & Responsibilities, Rev. 7	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.4.1	Ensure the NFPA 600 code review is included in the Fire Brigade Functional Area Management (FAM) Manual.		Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163			

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
Include in LAR/TR	No				
Change Eval / Mod Reference					
3.4.2 Pre-Fire Plans.	3.4.2* Pre-Fire Plans. Current and detailed pre-fire plans shall be available to the industrial fire brigade for all areas in which a fire could jeopardize the ability to meet the performance criteria described in Section 1.5.	Comply	Current and detailed pre-fire plans are available in the Oconee Plant Fire Plan.	Oconee Nuclear Site Fire Plan	
3.4.2.1 [Pre-Fire Plan Contents]	3.4.2.1* The plans shall detail the fire area configuration and fire hazards to be encountered in the fire area, along with any nuclear safety components and fire protection systems and features that are present.	Comply	Detailed pre-fire plans are available in the Oconee Nuclear Site Fire Plan.	Oconee Nuclear Site Fire Plan	
Open Item ID	**Open Item Description**		**Disposition**	**Open/Closed**	**Date Entered**
3.4.2.1	Evaluate the Fire Plan and associated documents (SOG, training materials, and directives) to ensure the minimum pre-plan content listed in FAQ 06-0025 is addressed.			Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163				
Include in LAR/TR	No				
Change Eval / Mod Reference					

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.4.2.2 [Pre-Fire Plan Updates]	3.4.2.2 Pre-fire plans shall be reviewed and updated as necessary.	Comply	The Fire Plan is maintained current. Plant directives require review of the Fire Plan.	NSD-301, Engineering Change Program, Rev. 27 NSD-228, Applicability Determination, Rev. 3	
3.4.2.3 [Pre-Fire Plan Locations]	3.4.2.3* Pre-fire plans shall be available in the control room and made available to the plant industrial fire brigade.	Comply	The Fire Plan is available in the Control Room and to the Fire Brigade at multiple locations.	NSD-112, Fire Brigade Organization, Training & Responsibilities, Rev. 7 Oconee Nuclear Site Fire Plan	
3.4.2.4 [Pre-Fire Plan Coordination Needs]	3.4.2.4* Pre-fire plans shall address coordination with other plant groups during fire emergencies.	Comply	Plant directives and fire brigade procedures address coordination with other plant groups.	NSD-112, Fire Brigade Organization, Training & Responsibilities, Rev. 7 RP/O/B/1000/029, Fire Brigade Response, Rev. 11	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.4.3 Training and Drills.	3.4.3 Training and Drills. Industrial fire brigade members and other plant personnel who would respond to a fire in conjunction with the brigade shall be provided with training commensurate with their emergency responsibilities. (a) Plant Industrial Fire Brigade Training. All of the following requirements shall apply. (1) Plant industrial fire brigade members shall receive training consistent with the requirements contained in NFPA 600, Standard on Industrial Fire Brigades, or NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, as appropriate. (2) Industrial fire brigade members shall be given quarterly training and practice in fire fighting, including radioactivity and health physics considerations, to ensure that each member is thoroughly familiar with the steps to be taken in the event of a fire. (3) A written program shall detail the industrial fire brigade training program. (4) Written records that include but are not limited to initial industrial fire brigade classroom and hands-on training, refresher training, special training schools attended, drill attendance records, and leadership training for industrial fire brigades shall be maintained for each industrial fire brigade member. (b) Training for Non-Industrial Fire Brigade Personnel. Plant personnel who respond with the industrial fire brigade shall be trained as to their responsibilities, potential hazards to be encountered, and interfacing with the industrial fire brigade. (c) * Drills. All of the following requirements shall apply. (1) Drills shall be conducted quarterly for each shift to test the response capability of the industrial fire brigade. (2) Industrial fire brigade drills shall be developed to test and challenge industrial fire brigade response, including brigade performance as a team, proper use of equipment, effective use of pre-fire plans, and coordination with other groups. These drills shall evaluate the industrial fire brigade's abilities to react, respond, and demonstrate proper fire-fighting techniques to control and extinguish the fire and smoke conditions being simulated by the drill scenario.	Comply	The Fire Brigade personnel receive appropriate training and the training records are maintained. All plant personnel are trained on reporting fires and interfacing with the Fire Brigade. Drills are conducted on a regular basis and involve various plant areas. The drills are critiqued and records are maintained.	PT/O/B/2000/001, Preparation and Conduct of Emergency Drills NSD-112, Fire Brigade Organization, Training & Responsibilities, Rev. 7 ERTG-001, Emergency Response Organization and Emergency Services Training Program	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
	(3) Industrial fire brigade drills shall be conducted in various plant areas, especially in those areas identified to be essential to plant operation and to contain significant fire hazards. (4) Drill records shall be maintained detailing the drill scenario, industrial fire brigade member response, and ability of the industrial fire brigade to perform as a team. (5) A critique shall be held and documented after each drill.				
3.4.4 Fire-Fighting Equipment.	3.4.4 Fire-Fighting Equipment. Protective clothing, respiratory protective equipment, radiation monitoring equipment, personal dosimeters, and fire suppression equipment such as hoses, nozzles, fire extinguishers, and other needed equipment shall be provided for the industrial fire brigade. This equipment shall conform with the applicable NFPA standards.	Comply	Fire brigade personnel are provided with the necessary equipment.	Oconee Nuclear Site Fire Plan PT/O/A/2200/010, KHS Fire Protection Equipment Surveillance, Rev. 25 PT/O/B/0250/030, Quarterly Fire Brigade Equipment Inspection	
3.4.5 Off-Site Fire Department Interface.	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		
3.4.5.1 Mutual Aid Agreement.	3.4.5.1 Mutual Aid Agreement. Off-site fire authorities shall be offered a plan for their interface during fires and related emergencies on site.	Comply	Letters of Agreement are in maintained with local off-site fire fighting organizations.	Oconee Emergency Plan	
3.4.5.2 Site-Specific Training.	3.4.5.2* Site-Specific Training. Fire fighters from the off-site fire authorities who are expected to respond to a fire at the plant shall be offered site-specific training and shall be invited to participate in a drill at least annually.	Comply	Annual training is specified in the Letters of Agreement.	NSD-112, Fire Brigade Organization, Training & Responsibilities, Rev. 7 Oconee Emergency Plan	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.4.5.3 Security and Radiation Protection.	3.4.5.3* Security and Radiation Protection. Plant security and radiation protection plans shall address off-site fire authority response.	Comply	Site directives include Security and Radiation Protection provisions for assistance to off-site fire authorities.	NSD-112, Fire Brigade Organization, Training & Responsibilities, Rev. 7 RP/O/B/1000/029, Fire Brigade Response, Rev. 11	
3.4.6 Communications.	3.4.6* Communications. An effective emergency communications capability shall be provided for the industrial fire brigade.	Comply	Emergency communication capabilities are provided.	PIP-0-O99-02753 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
3.5 Water Supply	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.1 [Water Supply Flow Code Requirements]	3.5.1 A fire protection water supply of adequate reliability, quantity, and duration shall be provided by one of the two following methods. (a) Provide a fire protection water supply of not less than two separate 300,000-gal (1,135,500-L) supplies. (b) Calculate the fire flow rate for 2 hours. This fire flow rate shall be based on 500 gpm (1892.5 L/min) for manual hose streams plus the largest design demand of any sprinkler or fixed water spray system(s) in the power block as determined in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, or NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection. The fire water supply shall be capable of delivering this design demand with the hydraulically least demanding portion of fire main loop out of service.	Complies by Previous NRC Approval	The fire protection water supply is adequate and reliable. The NRC August 11, 1978 SER Section 4.3.1.1 states: "The fire protection water supply is provided by the high-pressure service water (HPSW) pumps which take suction from separate circulating cooling water (CCW) system headers. The CCW system is supplied from Lake Keowee by pumps at the intake structure; the lake water would still be available on loss of power to the intake pumps because the system can operate as a siphon. The lake water supply has over 390,000 of water available." "In addition to the HPSW pumps, a 100,000 gallon elevation water storage tank floats on the HPSW system provides a backup fire protection water supply." "We find that the basic water supply system satisfies the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable." The NRC August 11, 1978 SER Section 4.3.1.2 states: "There are two 6,000 gpm HPSW pumps and one 500 gpm jockey pump, all rated at 117 psi net pressure. The two large pumps are considered redundant, each capable of supplying the largest design fire flows plus other simultaneous demands on the HPSW system." "We find that the fire pumps meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable."	SLC 16.9.7 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
		Further Action Required	Prior to implementation of the NFPA 805 program, Oconee will ensure that any required suppression systems for Nuclear Safety Capability Transition are within the design flow capabilities of the fire pump per NFPA 20.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.1	Ensure any required suppression systems for Chapter 4 are within the design flow capabilities of the fire pump per NFPA 20.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.2 [Water Supply Tank Code Requirements]	3.5.2* The tanks shall be interconnected such that fire pumps can take suction from either or both. A failure in one tank or its piping shall not allow both tanks to drain. The tanks shall be designed in accordance with NFPA 22, Standard for Water Tanks for Private Fire Protection. Exception No. 1: Water storage tanks shall not be required when fire pumps are able to take suction from a large body of water (such as a lake), provided each fire pump has its own suction and both suctions and pumps are adequately separated. Exception No. 2: Cooling tower basins shall be an acceptable water source for fire pumps when the volume is sufficient for both purposes and water quality is consistent with the demands of the fire service.	Comply	Oconee utilizes Lake Keowee as the primary fire water source.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 K FD-109A-01-01, Flow Diagram of Service Water System, Rev. 8	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.3 [Water Supply Pump Code Requirements]	3.5.3* Fire pumps, designed and installed in accordance with NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, shall be provided to ensure that 100 percent of the required flow rate and pressure are available assuming failure of the largest pump or pump power source.	Complies by Previous NRC Approval	The use of the High Pressure Service Water (HPSW) pumps to supply fire water is acceptable by the NRC. The NRC August 11, 1978 SER Section 4.3.1.2 states: "There are two 6,000 gpm HPSW pumps and one 500 gpm jockey pump, all rated at 117 psi net pressure. The two large pumps are considered redundant, each capable of supplying the largest design fire flows plus other simultaneous demands on the HPSW system. The pumps are electric motor driven receiving power from separate Unit No. 1 buses." "We find that the fire pumps meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable."	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 PIP 1999-4487 PIP 2001-3492	
		Further Action Required	Upon replacement of the Keowee fire pump (PIP O-2001-03492) ensure the installation meets the requirements of this section.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.3	Ensure resolution of the Keowee fire pump replacement (PIP O-2001-03492) satisfies the requirement of this section.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.4 [Water Supply Pump Diversity and Redundancy]	3.5.4 At least one diesel engine-driven fire pump or two more seismic Category I Class IE electric motor-driven fire pumps connected to redundant Class IE emergency power buses capable of providing 100 percent of the required flow rate and pressure shall be provided.	Complies by Previous NRC Approval	Diesel-engine driven fire water pumps are not utilized. Keowee uses an electric fire pump. The NRC has accepted the use of the HPSW pumps as Oconee fire pumps. The NRC August 11, 1978 SER Section 4.3.1.2 states: "There are two 6,000 gpm HPSW pumps and one 500 gpm jockey pump, all rated at 117 psi net pressure. The two large pumps are considered redundant, each capable of supplying the largest design fire flows plus other simultaneous demands on the HPSW system. The pumps are electric motor driven receiving power from separate Unit No. 1 buses." "We find that the fire pumps meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable."	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.5 [Water Supply Pump Separation Requirements]	3.5.5 Each pump and its driver and controls shall be separated from the remaining fire pumps and from the rest of the plant by rated fire barriers.	Complies by Previous NRC Approval	The HPSW pumps are separated from the rest of the plant and the NRC has approved the use and installation of the HPSW pumps for fire protection use. The NRC August 11, 1978 SER Section 4.3.1.1 states: "The HPSW pumps are located n the turbine building, each in a small masonry room enclosing the pump and motor. The power supply to each pump extends from the blockhouse via cables which are embedded in the turbine building floor." "We find that the fire pumps meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable."	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 PIP-O-05-04125	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.6 [Water Supply Pump Start/Stop Requirements]	3.5.6 Fire pumps shall be provided with automatic start and manual stop only.	Complies by Previous NRC Approval	Fire pumps (HPSW and Keowee) auto-start. The NRC August 11, 1978 SER Section 4.3.1.2 states: "The HPSW pumps are operated automatically based on the water level maintained in the elevated water storage tank. The pumps can also be manually started in the control room or at the pump switchgear located in the blockhouse. We find that the fire pumps meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable."	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 PIP 02-3870 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.6	Document the resolution of PIP 2002-3870 for installation HPSW manual stop.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	No
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.7 [Water Supply Pump Connection Requirements]	3.5.7 Individual fire pump connections to the yard fire main loop shall be provided and separated with sectionalizing valves between connections.	Comply	There are separate connections from pumps to the fire loops for ONS. Keowee does not have a yard main loop only underground piping.	K FD-109A-01-01, Flow Diagram of Service Water System, Rev. 8 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 Drawing Series OFD-124C	
3.5.8 [Water Supply Pressure Maintenance Limitations]	3.5.8 A method of automatic pressure maintenance of the fire protection water system shall be provided independent of the fire pumps.	Comply	The pressure in the HPSW system is maintained by the jockey pump. Keowee uses lake head to maintain system pressure.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
3.5.9 [Water Supply Pump Operation Notification]	3.5.9 Means shall be provided to immediately notify the control room, or other suitable constantly attended location, of operation of fire pumps.	Comply	The Control Room(s) are automatically notified of operation of the pumps used for fire protection.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.10 [Water Supply Yard Main Code Requirements]	3.5.10 An underground yard fire main loop, designed and installed in accordance with NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances, shall be installed to furnish anticipated water requirements.	Complies by Previous NRC Approval	The fire water piping system was found acceptable by the NRC. he NRC August 11, 1978 SER Section 4.3.1.3 states: "All yard fire hydrants, fixed water suppression systems, and interior hose lines are supplied by the HPSW system through underground yard mains and headers inside buildings." "We conclude that, upon implementation of the modifications described above, the fire water piping system meets the objectives outlined in Section 2.2 of this report and are, therefore, acceptable." Note that modifications referred to in the conclusion pertain to cross-connections of the auxiliary building headers to provide dual feed for hose stations in the area and are not applicable to this NFPA 805 section.	Drawing Series OFD-124C NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 K FD-109A-01-01, Flow Diagram of Service Water System, Rev. 8	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.11 [Water Supply Yard Main Maintenance Issues]	3.5.11 Means shall be provided to isolate portions of the yard fire main loop for maintenance or repair without simultaneously shutting off the supply to both fixed fire suppression systems and fire hose stations provided for manual backup. Sprinkler systems and manual hose station standpipes shall be connected to the plant fire protection water main so that a single active failure or a crack to the water supply piping to these systems can be isolated so as not to impair both the primary and backup fire suppression systems.	Comply	Sectionalizing valves are provided to allow isolation of various sections of the fire water system for maintenance or repair.	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 Drawing Series OFD-124C Engineering Support Program Document for Fire Protection, Rev. 4, 5/9/2005 K FD-109A-01-01, Flow Diagram of Service Water System, Rev. 8	
3.5.12 [Water Supply Compatible Thread Connections]	3.5.12 Threads compatible with those used by local fire departments shall be provided on all hydrants, hose couplings, and standpipe risers. Exception: Fire departments shall be permitted to be provided with adapters that allow interconnection between plant equipment and the fire department equipment if adequate training and procedures are provided.	Comply	Compatible threads are provided.	Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.13 [Water Supply Header Options]	3.5.13 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 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. Where provided, such headers shall be considered an extension of the yard main system. Each sprinkler and standpipe system shall be equipped with an outside screw and yoke (OS&Y) gate valve or other approved shutoff valve.	Complies by Previous NRC Approval	The fire water supply system has been approved by the NRC. Each header has a separate connection with shutoff valve to the fire water system. The NRC August 11, 1978 SER Section 4.3.1.1 states: "The fire protection water supply is provided by the high-pressure service water (HPSW) pumps which take suction from separate circulating cooling water (CCW) system headers." "We find that the basic water supply system satisfies the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable." The NRC August 11, 1978 SER Section 4.3.1.3 states: "All yard fire hydrants, fixed water suppression systems, and interior hose lines are supplied by the HPSW system through underground yard mains and headers inside buildings. Sectionalizing valves are provided to allow isolation of various sections of the system for maintenance; however there are locations in the turbine building where a single piping break could affect both automatic water suppression systems and manual hose stations. The licensee has proposed to cross-connect the ends of the two auxiliary building headers to provide dual feed for the hose stations in this area." "We conclude that, upon implementation of the modifications described above, the fire water piping system meets the objectives outlined in Section 2.2 of this report and	Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			are, therefore, acceptable." Note that modifications referred to in the conclusion pertain to cross-connections of the auxiliary building headers to provide dual feed for hose stations in the area and are not applicable to this NFPA 805 section.		
3.5.14 [Water Supply Control Valve Supervision]	3.5.14* All fire protection water supply and fire suppression system control valves shall be under a periodic inspection program and shall be supervised by one of the following methods. (a) Electrical supervision with audible and visual signals in the main control room or other suitable constantly attended location. (b) Locking valves in their normal position. Keys shall be made available only to authorized personnel. (c) Sealing valves in their normal positions. This option shall be utilized only where valves are located within fenced areas or under the direct control of the owner/operator.	Comply	Fire protection valves are locked or sealed.	PT/0/A/0250/010 A, "Fire Protection System Monthly Check" NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.15 [Water Supply Hydrant Code Requirements]	3.5.15 Hydrants shall be installed approximately every 250 ft (76 m) apart on the yard main system. 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 ft (305 m) along the yard main system. Exception: Mobile means of providing hose and associated equipment, such as hose carts or trucks, shall be permitted in lieu of hose houses. Where provided, such mobile equipment shall be equivalent to the equipment supplied by three hose houses.	Complies by Previous NRC Approval	The NRC determined that the hydrants installed at approximately 300 feet intervals are acceptable. The NRC August 11, 1978 SER Section 4.3.1.3 states: "Yard fire hydrants have been provided at approximately 300 ft. intervals around the exterior of the plant. Auxiliary gate valves are not provided on the hydrant laterals, with the result that a portion of the fire water heads would have to be removed from service if a fire hydrant has to be isolated for maintenance." "Hose houses have been provided at seven of the yard hydrants, each equipped with at least 200 ft. of 2-1/2 inch hose, 200 ft. of 1-1/2 inch hose and other manual fire fighting tools." "We conclude that, upon implementation of the modifications described above, the fire water piping system meets the objectives outlined in Section 2.2 of this report and are, therefore, acceptable." Note that modifications referred to in the conclusion pertain to cross-connections of the auxiliary building headers to provide dual feed for hose stations in the area and are not applicable to this NFPA 805 section.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 PT/O/B/0250/030, Quarterly Fire Brigade Equipment Inspection NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.5.16 [Water Supply Dedicated Limits]	3.5.16* The fire protection water supply system shall be dedicated for fire protection use only. Exception No. 1: 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. Exception No. 2: Fire protection water storage can be provided by plant systems serving other functions, provided the storage has a dedicated capacity capable of providing the maximum fire protection demand for the specified duration as determined in this section.	Complies by Previous NRC Approval	The use of the HPSW system and LPSW system for fire protection was found acceptable by the NRC. The NRC August 11, 1978 SER Section 4.3.1.2 states: "There are two 6,000 gpm HPSW pumps and one 500 gpm jockey pump, all rated at 117 psi net pressure. The two large pumps are considered redundant, each capable of supplying the largest design fire flows plus other simultaneous demands on the HPSW system." "We find that the fire pumps meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable." The Reactor Building hose stations are supplied via the LPSW system. The LPSW system is sized to be capable of essential service water flow demands and to support fire hose stations. The NRC August 11, 1978 SER Section 4.3.1.4 states "Interior hose stations equipped with 1-1/2 inch fire hose have been provided through the plant except in containment. Some areas are too far away from a hose station for effective fire fighting. The licensee has proposed to provide additional hose stations so that all areas containing or exposing safety-related equipment will be within effective fire fighting range of at least one hose station using not more than 100 ft. of 1-1/2 inch fire hose, and to provide hose stations inside containment supplied by the LPSW system." "Upon completion of the proposed modification, we find that the interior hose stations meet the requirements of Appendix	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			A to BTP 9.5-1 and are, therefore, acceptable." The modification referenced above to provide hose stations inside containments supplied by the LPSW system has been implemented.		
3.6 Standpipe and Hose Stations.	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.6.1 [Standpipe and Hose Station Code Requirements]	3.6.1 For all power block buildings, Class III standpipe and hose systems shall be installed in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems.	Complies by Previous NRC Approval	The standpipe and fire hose systems were found acceptable. The NRC August 11, 1978 SER Section 4.3.1.4 states: "Interior hose stations equipped with 1-1/2 inch fire hose have been provided through the plant except in containment. Some areas are too far away from a hose station for effective fire fighting. The licensee has proposed to provide additional hose stations so that all areas containing or exposing safety-related equipment will be within effective fire fighting range of at least one hose station using not more than 100 ft. of 1-1/2 inch fire hose, and to provide hose stations inside containment supplied by the LPSW system." "Upon completion of the proposed modification, we find that the interior hose stations meet the requirements of Appendix A to BTP 9.5-1 and are, therefore, acceptable." The modification referenced above to provide additional hose stations has been implemented. The NRC June 7, 1988 SER states: "The licensee has proposed a modification to move five fire hose station presently located within the Cable Spreading rooms to stairwell locations outside the rooms. The purpose of this modification is to make the fire hose station accessible for fire fighting activities in these rooms." "The proposed modification of fire hose stations will enhance the fire fighting	1978-02-17 Duke Letter to NRC, 2/17/1978 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated June 7, 1988, 6/7/1988 SLC 16.9.4, 1/30/2000 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			capabilities in the Cable Spreading Rooms and meets the intent of the guidance provided in National Fire Protection Association (NFPA) Std. 14, Standpipe and Hose Systems, for the location of fire hose connections. After reviewing these proposed TS changes, the staff has determined they are acceptable." The modification referenced above to relocate fire hose stations from the Cable Spreading rooms has been implemented.		
		Further Action Required	Oconee will enhance current documentation, prior to implementation of the NFPA 805 program, to perform a NFPA 14 code compliance review for standpipe systems not addressed by the previous SER but included in the new power block definition.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.6.1	Perform a NFPA 14 code compliance review.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.6.2 [Standpipe and Hose Station Capability Limitations]	3.6.2 A capability shall be provided to ensure an adequate water flow rate and nozzle pressure for all hose stations. This capability includes the provision of hose station pressure reducers where necessary for the safety of plant industrial fire brigade members and off-site fire department personnel.	Comply	The fire water supply system can provide adequate water flow and pressure at all hose stations.	OSC-1626, Pressure At Hose Stations In Auxiliary and Turbine Buildings, Rev. 002, 8/29/2001 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
3.6.3 [Standpipe and Hose Station Nozzle Restrictions]	3.6.3 The proper type of hose nozzle to be supplied to each power block area shall be based on the area fire hazards. The usual combination spray/straight stream nozzle shall not be used in areas where the straight stream can cause unacceptable damage or present an electrical hazard to fire-fighting personnel. Listed electrically safe fixed fog nozzles shall be provided at locations where high-voltage shock hazards exist. All hose nozzles shall have shutoff capability and be able to control water flow from full open to full closed.	Comply	The appropriate hose nozzles have been provided.	Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 Fire Plan, SOG #3, Electrical Fires 1977-11-22 Duke Letter to NRC, 11/22/1977 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.6.4 [Standpipe and Hose Station Earthquake Provisions]	3.6.4 Provisions shall be made to supply water at least to standpipes and hose stations for manual fire suppression in all areas containing systems and components needed to perform the nuclear safety functions in the event of a safe shutdown earthquake (SSE). Exception: For existing plants that are not capable of meeting this requirement, provisions to restore a water supply and distribution system for manual fire-fighting purposes shall be made. This provisional manual fire-fighting standpipe/hose station system shall be capable of providing manual fire-fighting protection to the various plant locations important to supporting and maintaining the nuclear safety function. The provisions for establishing this provisional system shall be preplanned and be capable of being implemented in a timely manner following an SSE.	Complies by Previous NRC Approval	The interior hose stations were found acceptable by the NRC. Seismically designed hose stations are provided in the Reactor Building and the Cable Room to Control Room back stairwells. The HPSW system is not seismically designed. Fire hose stations (with the exception of those in the Reactor Building and Unit 1/2 and Unit 3 Cable Room to Control Room back stair hose stations) are not seismically designed. NFPA 14-1969 (code of record) did not have provisions for seismically designed hose stations. The HPSW system is not seismically designed. The NRC previously found the hose stations acceptable per Section 3.6.1 above.	OSS-0254.00-00-1002, Design Basis Specification for the High Pressure Service Water System, Rev. 25, 8/14/2006 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	
3.6.5 [Standpipe and Hose Station Seismic Connection Limitations]	3.6.5 Where the seismic required hose stations are cross-connected to essential seismic non-fire protection water supply systems, the fire flow shall not degrade the essential water system requirement.	Comply	Fire flow will not affect the essential water system.	OSS-0254.00-00-1039, Design Basis Specification for the Low Pressure Service Water System, Rev. 34, 5/16/2005 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.7 Fire Extinguishers.	3.7 Fire Extinguishers. Where provided, fire extinguishers of the appropriate number, size, and type shall be provided in accordance with NFPA 10, Standard for Portable Fire Extinguishers. Extinguishers shall be permitted to be positioned outside of fire areas due to radiological conditions.	Complies by Previous NRC Approval	The portable fire extinguishers meet the requirements of NFPA 10 Portable fire extinguishers are provided in accordance with NFPA 10, "Standard For Portable Fire Extinguishers." The portable extinguishers used on site are either "ABC", Carbon Dioxide, or Halon type fire extinguishers. Fire extinguishers are generally stationed in accordance the requirements of NFPA 10. In some instances extinguishers are not located in all areas due to ALARA. In these cases the extinguishers are located near the entrance to the areas. Halon fire extinguishers are provided in the Main Control Room, Training Simulator Room, the Communications Room, and at the vault in the first floor of Administrative Building. The NRC August 11, 1978 SER Section 4.3.3 states: "Portable fire extinguishers have been distributed throughout the plant in accordance with NFPA guidelines. The licensee has proposed to provide Halon 1211 extinguisher in the control room." "Upon completion of the proposed modification, we find that portable fire extinguishers will conform to the provisions of Appendix A to BTP 9.5-1 and accordingly is acceptable." The modification referenced above to install Halon extinguishers in the control rooms has been implemented.	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
		Further Action	Oconee will enhance current		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
		Required	documentation, prior to implementation of the NFPA 805 program, to perform a NFPA 10 code compliance review.		
Open Item ID	**Open Item Description**		**Disposition**	**Open/Closed**	**Date Entered**
3.7	Perform a NFPA 10 code compliance review.			Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163				
Include in LAR/TR	Yes				
Change Eval / Mod Reference					
3.8 Fire Alarm and Detection Systems.	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.8.1 Fire Alarm.	3.8.1 Fire Alarm. Alarm initiating devices shall be installed in accordance with NFPA 72, National Fire Alarm Code®. Alarm annunciation shall allow the proprietary alarm system to transmit fire-related alarms, supervisory signals, and trouble signals to the control room or other constantly attended location from which required notifications and response can be initiated. Personnel assigned to the proprietary alarm station shall be permitted to have other duties. The following fire-related signals shall be transmitted: (1) Actuation of any fire detection device (2) Actuation of any fixed fire suppression system (3) Actuation of any manual fire alarm station (4) Starting of any fire pump (5) Actuation of any fire protection supervisory device (6) Indication of alarm system trouble condition	Complies by Previous NRC Approval	Fire related signals are transmitted to the control rooms. The fire detection and signaling system was found acceptable by the NRC. The NRC August 11, 1978 SER Section 4.2 states: "The plant has a protective signaling system which transmits alarms from fire detectors and water spray system actuation to the control room. Water flow on wet pipe sprinkler systems does not alarm in the control room. In general, the system complies with those provision of NFPA 72D which are considered essential for the facility, including requirements for emergency power supply and circuit supervision. There is no distinct audible fire alarm signal provided in the control room. The licensee has proposed to provide water flow alarms in the control room for all wet pipe sprinkler systems, and a unique audible signal in the control room for fire alarm notification of the operators. We find that, subject to the implementation of the proposed modifications, the fire detection and signaling system in conjunction with the safe shutdown system satisfies the objectives of Section 2.2 of this report and is, therefore, acceptable." Modifications referenced above to providing water flow alarms and a distinct audible fire alarm signal in the control room have been implemented.	OSS-0254.00-00-2017, Design Basis Specification for the Fire Detection System, Rev. 8, 4/12/2005 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.8.1 Fire Alarm.	3.8.1 Fire Alarm. Alarm initiating devices shall be installed in accordance with NFPA 72, National Fire Alarm Code®. Alarm annunciation shall allow the proprietary alarm system to transmit fire-related alarms, supervisory signals, and trouble signals to the control room or other constantly attended location from which required notifications and response can be initiated. Personnel assigned to the proprietary alarm station shall be permitted to have other duties. The following fire-related signals shall be transmitted: (1) Actuation of any fire detection device (2) Actuation of any fixed fire suppression system (3) Actuation of any manual fire alarm station (4) Starting of any fire pump (5) Actuation of any fire protection supervisory device (6) Indication of alarm system trouble condition	Further Action Required	Perform a NFPA 72 code compliance review of the fire alarm and detection systems (See Section 3.8.2)		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.8.1	Perform a NFPA 72 code compliance review of the fire alarm and detection systems (See Section 3.8.2)		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

3.8.1.1 [Fire Alarm Communication Requirements]	3.8.1.1 Means shall be provided to allow a person observing a fire at any location in the plant to quickly and reliably communicate to the control room or other suitable constantly attended location.	Comply	Means to report a fire are provided.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 General Employee Training - Plant Access Training	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.8.1.2 [Fire Alarm Prompt Notification Limits]	3.8.1.2 Means shall be provided to promptly notify the following of any fire emergency in such a way as to allow them to determine an appropriate course of action: (1) General site population in all occupied areas (2) Members of the industrial fire brigade and other groups supporting fire emergency response (3) Off-site fire emergency response agencies. Two independent means shall be available (e.g., telephone and radio) for notification of off-site emergency services	Comply	The Control Room notifies station personnel of a fire event over the Plant PA System and can communicate with Brigade personnel and Off-Site agencies by various means.	RP/O/B/1000/029, Fire Brigade Response, Rev. 11	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.8.2 Detection.	3.8.2 Detection. If automatic fire detection is required to meet the performance or deterministic requirements of Chapter 4, then these devices shall be installed in accordance with NFPA 72, National Fire Alarm Code, and its applicable appendixes.	Complies by Previous NRC Approval	The fire detection and signaling system was found acceptable by the NRC. The system was installed in accordance with applicable codes of records with documented deviations. The NRC August 11, 1978 SER Section 4.2 states: "The plant has a protective signaling system which transmits alarms from fire detectors and water spray system actuation to the control room. Water flow on wet pipe sprinkler systems does not alarm in the control room. In general, the system complies with those provision of NFPA 72D which are considered essential for the facility, including requirements for emergency power supply and circuit supervision. There is no distinct audible fire alarm signal provided in the control room." "Smoke detectors in some areas of the plant containing electrical cable insulation are located lower than the ceiling level and, therefore, may not respond as rapidly as they would if located at the ceiling. However, since fires in cable insulation generate heavy quantities of smoke, reasonably prompt detection can be expected. Ionization type smoke detectors are used throughout the plant. In some tests, ionization type detectors have not responded as rapidly to a fire involving PVC as they do to a fire involving other types of insulation. Tests have shown that they are, however, adequate to detect first in their early stages. To assure that fires in safe shutdown areas of the plant are detected, the licensee has proposed, in addition to the exiting detection system, to provide	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 SLC 16.9.6, 12/14/2004 OSS-0254.00-00-2017, Design Basis Specification for the Fire Detection System, Rev. 8, 4/12/2005	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			detectors in all areas containing safe shutdown equipment and combustibles. In addition, the licensee has proposed to provide a dedicated safe shutdown system which would be unaffected by fires involving safe shutdown equipment such that the plant can be safely shut down in the event of a fire in any location in the plant." "We find that, subject to the implementation of the proposed modifications, the fire detection and signaling system in conjunction with the safe shutdown system satisfies the objectives of Section 2.2 of this report and is, therefore, acceptable." Modifications referenced above including addition of detectors in areas containing safe shutdown equipment and providing a dedicated safe shutdown system have been implemented.		
		Further Action Required	Upon completion of the Nuclear Safety Capability Transition, Oconee will perform a NFPA 72 code compliance review of the fire alarm and detection systems required to meet the nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action).		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.8.2	Upon completion of Chapter 4 work and determination where automatic fire detection is required to meet the performance or deterministic requirements of NFPA 805, PRA, change evaluation or defense-in-depth. Perform a NFPA 72 code compliance review of the fire alarm and detection systems.		Open	4/24/2008

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
Corrective Action Reference	PIP 0-08-2163				
Include in LAR/TR	Yes				
Change Eval / Mod Reference					
3.9 Automatic and Manual Water-Based Fire Suppression Systems.	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.9.1 [Fire Suppression System Code Requirements]	3.9.1* If an automatic or manual water-based fire suppression system is required to meet the performance or deterministic requirements of Chapter 4, then the system shall be installed in accordance with the appropriate NFPA standards including the following: (1) NFPA 13, Standard for the Installation of Sprinkler Systems (2) NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection (3) NFPA 750, Standard on Water Mist Fire Protection Systems (4) NFPA 16, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems	Complies by Previous NRC Approval	The installed sprinkler systems were found acceptable by the NRC. The NRC August 11, 1978 SER Section 4.3.1.3 states: "Wet pipe automatic sprinkler provide area coverage over those portions of the turbine building basement and mezzanine levels which contain the turbine oil piping systems." "Automatic water spray systems are installed on the turbine oil headers and reservoirs, feed water pumps, and hydrogen seal oil units in the turbine building; and on oil-filled transformers and reactors in the yard areas. The water spray systems are designed according to applicable NFPA Standards." "We find that the sprinkler systems meet the requirements of Appendix A of BTP 9.5-1 and are, therefore, acceptable."	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 Engineering Support Program Document for Fire Protection, Rev. 4, 5/9/2005 SLC 16.9.2, 6/28/2005 PIP O-02-06047 NRC Letter to Duke dated February 2, 1982, Grants Exemption Tp App R Fire Suppression System In Control Room, 2/2/1982	
		Comply by Previous Licensee Evaluation	NFPA code compliance calculations have been performed for automatic and manual water-based fire suppression systems.	ONS Automatic Water Based Suppression System Code Compliance Calculations	
		Further Action Required	Upon completion of the Nuclear Safety Capability Transition, Oconee will perform a code compliance review and/or review the applicable Fire Suppression NFPA Code Review calculations of the water based fire		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			suppression systems required to meet the nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action).		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.9.1	Upon completion of Chapter 4 work and determination where water based fire suppression systems are required to meet the performance or deterministic requirements of NFPA 805, PRA, change evaluation or defense-in-depth; perform a code compliance review and/or review the applicable Fire Suppression NFPA Code Review calculations.		Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163			
Include in LAR/TR	Yes			
Change Eval / Mod Reference				

3.9.2 [Fire Suppression System Flow Alarm]	3.9.2 Each system shall be equipped with a water flow alarm.	Comply	Each fixed extinguishing system is provided with an alarm.	1977-11-22 Duke Letter to NRC, 11/22/1977 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.9.3 [Fire Suppression System Alarm Locations]	3.9.3 All alarms from fire suppression systems shall annunciate in the control room or other suitable constantly attended location.	Comply	Alarms are annunciated in the Control Rooms or other remote constantly attended area.	OSS-0254.00-00-2017, Design Basis Specification for the Fire Detection System, Rev. 8, 4/12/2005 1977-11-22 Duke Letter to NRC, 11/22/1977 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	
3.9.4 [Fire Suppression System Diesel Pump Sprinkler Protection]	3.9.4 Diesel-driven fire pumps shall be protected by automatic sprinklers.	N/A	There are no diesel-driven fire water pumps utilized at the Oconee Plant.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.9.5 [Fire Suppression System Shutoff Controls]	3.9.5 Each system shall be equipped with an OS&Y gate valve or other approved shutoff valve.	Complies by Previous NRC Approval	Each suppression system is connected to the header with an approved control valve. The NRC August 11, 1978 SER Section 4.3.1.3 states: "All yard fire hydrants, fixed water suppression systems, and interior hose lines are supplied by the HPSW system through underground yard mains and headers inside buildings. Sectionalizing valves are provided to allow isolation of various sections of the system for maintenance; however there are locations in the turbine building where a single piping break could affect both automatic water suppression systems and manual hose stations. The licensee has proposed to cross-connect the ends of the two auxiliary building headers to provide dual feed for the hose stations in this area." "We conclude that, upon implementation of the modifications described above, the fire water piping system meets the objectives outlined in Section 2.2 of this report and are, therefore, acceptable." Note that modifications referred to in the conclusion pertain to cross-connections of the auxiliary building headers to provide dual feed for hose stations in the area and are not applicable to this NFPA 805 section.	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 Duke Letter to the NRC dated February 1982, Response to Appendix A to Branch Technical Position APCSB 9.5-1, 2/1/1982	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.9.6 [Fire Suppression System Valve Supervision]	3.9.6 All valves controlling water-based fire suppression systems required to meet the performance or deterministic requirements of Chapter 4 shall be supervised as described in 3.5.14.	Complies by Previous NRC Approval	The valves are not electrically supervised but are locked or sealed in accordance with Section 3.5.14.		
3.10 Gaseous Fire Suppression Systems.	N/A	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.10.1 [Gaseous Suppression System Code Requirements]	3.10.1 If an automatic total flooding and local application gaseous fire suppression system is required to meet the performance or deterministic requirements of Chapter 4, then the system shall be designed and installed in accordance with the following applicable NFPA codes: (1) NFPA 12, Standard on Carbon Dioxide Extinguishing Systems (2) NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems (3) NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems	Further Action Required	The gaseous fire suppression systems at the Oconee Nuclear Plant are utilized to protect unique components and/or hazards. The SSF Diesel Generator Room is protected by a low pressure total flooding carbon dioxide suppression system. SSF Diesel Generator Room CO2 system is not a regulatory committed system. The two Keowee Hydroelectric generators are each protected by a High Pressure Carbon Dioxide Suppression System that provides CO2 directly into the generator housing. The Keowee CO2 Fire Suppression System is currently a NRC committed system listed in SLC 16.9.3. Upon completion of the Nuclear Safety Capability Transition, Oconee will perform a code compliance review of the gaseous fire suppression systems required to meet the nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action).		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.10.1	Upon completion of Chapter 4 work and determination where gaseous fire suppression systems are required to meet the performance or deterministic requirements of NFPA 805, PRA, change evaluation or defense-in-depth. Perform a NFPA 12 code compliance review.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref. / Change Eval / Mod Reference	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.10.2 [Gaseous Suppression System Alarm Location]	3.10.2 Operation of gaseous fire suppression systems shall annunciate and alarm in the control room or other constantly attended location identified.	Comply	Operation of a Keowee gaseous suppression system is annunciated in the Unit 2 Control Room and Keowee; operation of the SSF gaseous suppression system is annunciated in the Unit 2 Control Room and Security.	OSS-0254.00-00-2017, Design Basis Specification for the Fire Detection System, Rev. 8, 4/12/2005 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.10.3 [Gaseous Suppression System Ventilation Limitations]	3.10.3 Ventilation system design shall take into account prevention from over-pressurization during agent injection, adequate sealing to prevent loss of agent, and confinement of radioactive contaminants.	Comply	The Keowee Hydro Station system injects into the respective hydroelectric generator's housing and not into a ventilation system. The leak tightness of the housings is included in the system testing procedure to ensure substantial concentration. The SSF CO2 System injects only into the Diesel Generator Room. The ventilation system to the room is isolated during system actuation to ensure concentration for at least 30 minutes. There are no radioactive contaminants involved at either location protected by the gaseous fire suppression systems.		
		Further Action Required	Evaluate and document the potential effects of over pressurization in the areas of CO2 System discharge.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.10.3	Evaluate and document the potential effects of over pressurization in the areas of CO2 System discharge.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.10.4 [Gaseous Suppression System Single Failure Limits]	3.10.4* In any area required to be protected by both primary and backup gaseous fire suppression systems, a single active failure or a crack in any pipe in the fire suppression system shall not impair both the primary and backup fire suppression capability.	Comply	There are no installed backup gaseous fire suppression systems utilized at Oconee.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	
		Further Action Required	Upon completion of the Nuclear Safety Capability Transition and determination if backup gaseous fire suppression systems are required to meet nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action) this section should be reviewed.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.10.4	Upon completion of Chapter 4 work and determination if backup gaseous fire suppression systems are required to meet the performance or deterministic requirements, PRA, change evaluation or defense-in-depth; compliance with this section should be reviewed.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.10.5 [Gaseous Suppression System Disarming Controls]	3.10.5 Provisions for locally disarming automatic gaseous suppression systems shall be secured and under strict administrative control.	Comply	Locally disarming an automatic gaseous fire suppression system is controlled.	PT/0/A/0400/002, SSF CO2 Test PT/2/A/2200/006, KHU-2 CO2 System Surveillance OP/0/A/1600/004, Operation of the SSF CO2 System PT/1/A/2200/006, KHU-1 CO2 System Surveillance	
3.10.6 [Gaseous Suppression System CO2 Limitations]	3.10.6* Total flooding carbon dioxide systems shall not be used in normally occupied areas.	Comply	The areas protected by the installed CO2 systems are not normally occupied.	PT/2/A/2200/006, KHU-2 CO2 System Surveillance PT/0/A/0400/002, SSF CO2 Test PT/1/A/2200/006, KHU-1 CO2 System Surveillance OP/0/A/1600/004, Operation of the SSF CO2 System	
3.10.7 [Gaseous Suppression System CO2 Warnings]	3.10.7 Automatic total flooding carbon dioxide systems shall be equipped with an audible pre-discharge alarm and discharge delay sufficient to permit egress of personnel. The carbon dioxide system shall be provided with an odorizer.	Comply	A pre-discharge alarm is provided for the SSF CO2 Systems. Keowee whistles on discharge. The SSF System is provided with an odorizer. The Keowee Hydro Station's CO2 supply is not provided with an odorizer because the area is not occupied.	PT/0/A/0400/002, SSF CO2 Test	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.10.8 [Gaseous Suppression System CO2 Required Disarming]	3.10.8 Positive mechanical means shall be provided to lock out total flooding carbon dioxide systems during work in the protected space.	Comply	There are positive means to lock out the respective CO2 system during work in the area.	PT/1/A/2200/006, KHU-1 CO2 System Surveillance OP/0/A/1600/004, Operation of the SSF CO2 System PT/2/A/2200/006, KHU-2 CO2 System Surveillance PT/0/A/0400/002, SSF CO2 Test	
3.10.9 [Gaseous Suppression System Cooling Considerations]	3.10.9 The possibility of secondary thermal shock (cooling) damage shall be considered during the design of any gaseous fire suppression system, but particularly with carbon dioxide.	Further Action Required	Evaluate and document the potential effects of rapid cooling of the Keowee Generators and the SSF Diesel Generator and their associate components in the area of CO2 System discharge.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.10.9	Evaluate and document the potential effects of rapid cooling of either the Keowee Generators or the SSF Diesel Generator and their associate components in the area of CO2 System discharge.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.10.10 [Gaseous Suppression System Decomposition Issues]	3.10.10 Particular attention shall be given to corrosive characteristics of agent decomposition products on safety systems.	Further Action Required	There are safety systems protected by CO2 systems. Evaluate and document the potential effects of corrosivity on the Keowee Generators and the SSF Diesel Generator and their associate components in the area of CO2 System discharge.	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.10.10	Evaluate and document the potential effects of corrosivity on the Keowee Generators or the SSF Diesel Generator and their associate components in the area of CO2 System discharge.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

3.11 Passive Fire Protection Features	3.11 Passive Fire Protection Features. This section shall be used to determine the design and installation requirements for passive protection features. Passive fire protection features include wall, ceiling, and floor assemblies, fire doors, fire dampers, and through fire barrier penetration seals. Passive fire protection features also include electrical raceway fire barrier systems (ERFBS) that are provided to protect cables and electrical components and equipment from the effects of fire.	N/A	N/A - Section Heading, see sub-sections for any specific compliance statements

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.11.1 Building Separation.	3.11.1 Building Separation. Each major building within the power block shall be separated from the others by barriers having a designated fire resistance rating of 3 hours or by open space of at least 50 ft (15.2 m) or space that meets the requirements of NFPA 80A, Recommended Practice for Protection of Buildings from Exterior Fire Exposures. Exception: Where a performance-based analysis determines the adequacy of building separation, the requirements of 3.11.1 shall not apply.	Complies by Previous NRC Approval	Building separation has been approved by the NRC. The Keowee Hydro Station and the SSF are separated from the other buildings by a distance of greater than 50 feet. The NRC August 11, 1978 SER Section 4.11 states "Fire barriers have been provided to separate the turbine building from the auxiliary building, and to cut off the equipment rooms, cable spreading rooms, control rooms, penetration areas and blockhouses from surrounding fire areas. Based on the type and quantity of combustibles present, the basic fire resistance of the barriers would prevent the spread of fire between fire areas." "Upon completion of the dedicated safe shutdown system, the facility will be able to sustain a fire in any fire area and still achieve safe shutdown of the three units. We conclude that, upon completion of the dedicated safe shutdown system, the fire barriers meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable." The dedicated shutdown system (SSF) has been completed.	NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 SLC 16.9.5, 1/30/2000 NRC Letter dated April 14, 1981, 4/14/1981 1989-08-21 NRC SER, Exemption from the Fire Protection Requirements of Section III.G of 10 CFR 50, Appendix R, 8/21/1989 Drawing Series O-310 K and L, Fire Protection Plan & Fire, Flood, & Pressure Boundaries NRC Safety Evaluation Report dated April 28, 1983, 4/28/1983 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.11.2 Fire Barriers.	3.11.2 Fire Barriers. Fire barriers required by Chapter 4 shall include a specific fire-resistance rating. Fire barriers shall be designed and installed to meet the specific fire resistance rating using assemblies qualified by fire tests. The qualification fire tests shall be in accordance with NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials, or ASTM E 119, Standard Test Methods for Fire Tests of Building Construction and Materials.	Complies by Previous NRC Approval	The fire barriers between the major plant buildings were found to be acceptable by the NRC. The NRC August 11, 1978 SER Section 4.11 states: "Fire barriers have been provided to separate the turbine building from the auxiliary building, and to cut off the equipment rooms, cable spreading rooms, control rooms, penetration areas and blockhouses from surrounding fire areas. Based on the type and quantity of combustibles present, the basic fire resistance of the barriers would prevent the spread of fire between fire areas." "Upon completion of the dedicated safe shutdown system, the facility will be able to sustain a fire in any fire area and still achieve safe shutdown of the three units. We conclude that, upon completion of the dedicated safe shutdown system, the fire barriers meet the objectives outlined in Section 2.2 of this report and are, therefore, acceptable." The dedicated shutdown system (SSF) has been completed.	Drawing Series O-310 K and L, Fire Protection Plan & Fire, Flood, & Pressure Boundaries 1989-08-21 NRC SER, Exemption from the Fire Protection Requirements of Section III.G of 10 CFR 50, Appendix R, 8/21/1989 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 NRC Letter dated April 14, 1981, 4/14/1981 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 SLC 16.9.5, 1/30/2000	
		Further Action Required	Upon completion of the Nuclear Safety Capability Transition, identify barriers required to meet the nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action).		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			Review credited barriers to determine their adequacy.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.11.2	Upon completion of Chapter 4 work, identify barriers credited for compliance, PRA, defense-in-depth or as part of the change evaluation process. Review if credited barriers are adequate.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.11.3 Fire Barrier Penetrations.	3.11.3* Fire Barrier Penetrations. Penetrations in fire barriers shall be provided with listed fire-rated door assemblies or listed rated fire dampers having a fire resistance rating consistent with the designated fire resistance rating of the barrier as determined by the performance requirements established by Chapter 4. (See 3.11.4 for penetration seals for through penetration fire stops.) Passive fire protection devices such as doors and dampers shall conform with the following NFPA standards, as applicable: (1) NFPA 80, Standard for Fire Doors and Fire Windows (2) NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems (3) NFPA 101, Life Safety Code Exception: Where fire area boundaries are not wall-to-wall, floor-to-ceiling boundaries with all penetrations sealed to the fire rating required of the boundaries, a performance-based analysis shall be required to assess the adequacy of fire barrier forming the fire boundary to determine if the barrier will withstand the fire effects of the hazards in the area. Openings in fire barriers shall be permitted to be protected by other means as acceptable to the AHJ.	Complies by Previous NRC Approval	The fire barrier penetrations were found to be acceptable by the NRC. The NRC August 11, 1978 SER Section 4.9.2 states: "The licensee has proposed to make the following modification on doors and hatches in fire barriers: (1) Replace unlabeled fire doors and frames in fire barriers with properly labeled fire doors and frames. (2) Modify double-leaf fire doors to normally keep one door closed to assure proper closure. (3) Modify the door arrangement of openings between the turbine building and auxiliary building to prevent glass doors from obstructing automatic fire door closure. (4) Upgrade the metal hatch plates in the floor between the cable spreading room and control room to provide a 3-hour fire rated barrier. The license has stated that doors separate redundant safe shutdown equipment or protecting safe shutdown equipment from large hazards are alarmed to the control room and provided with automatic closure devices." "Upon completion of these modifications, the doorway and hatch penetrations of fire barriers will conform to the provisions of Appendix A to BTP 9.5-1 and are, therefore, acceptable." The fire door modifications referenced above have been implemented. Duke letter to the NRC dated May 15, 1981	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 SLC 16.9.5, 1/30/2000 NRC Safety Evaluation Report dated August 11, 1978, 8/11/1978 Drawing Series O-310 K and L, Fire Protection Plan & Fire, Flood, & Pressure Boundaries Duke Letter to the NRC, dated May 15, 1981	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			responded to some modifications indicating completion or insurance company approval of existing fire door configurations. The NRC August 11, 1978 SER Section 4.9.3 states: "Fire dampers have been provide at some locations where ventilation ducts penetrate fire barriers. The licensee has proposed to upgrade ventilation duct penetrations with dampers having fire ratings equivalent to that required by fire barriers." "We find that, subject to implementation of the above modifications, ventilation duct penetrations will satisfy the objectives identified in Section 2.2 of this report and are, therefore, acceptable."		
		Further Action Required	Upon completion of the Nuclear Safety Capability Transition, identify barriers required to meet the nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action). Review credited barrier penetrations to determine their adequacy.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.11.3	Upon completion of Chapter 4 work, identify barriers credited for compliance, PRA, defense-in-depth or as part of the change evaluation process. Review if credited barrier penetrations are adequate.		Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163			

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
Include in LAR/TR	Yes				
Change Eval / Mod Reference					

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.11.4 Through Penetration Fire Stops.	3.11.4* Through Penetration Fire Stops. Through penetration fire stops for penetrations such as pipes, conduits, bus ducts, cables, wires, pneumatic tubes and ducts, and similar building service equipment that pass through fire barriers shall be protected as follows. (a) The annular space between the penetrating item and the through opening in the fire barrier shall be filled with a qualified fire-resistive penetration seal assembly capable of maintaining the fire resistance of the fire barrier. The assembly shall be qualified by tests in accordance with a fire test protocol acceptable to the AHJ or be protected by a listed fire-rated device for the specified fire-resistive period. (b) Conduits shall be provided with an internal fire seal that has an equivalent fire-resistive rating to that of the fire barrier through opening fire stop and shall be permitted to be installed on either side of the barrier in a location that is as close to the barrier as possible. Exception: Openings inside conduit 4 in. (10.2 cm) or less in diameter shall be sealed at the fire barrier with a fire-rated internal seal unless the conduit extends greater than 5 ft (1.5 m) on each side of the fire barrier. In this case the conduit opening shall be provided with noncombustible material to prevent the passage of smoke and hot gases. The fill depth of the material packed to a depth of 2 in. (5.1 cm) shall constitute an acceptable smoke and hot gas seal in this application.	Complies by Previous NRC Approval	The NRC has approved exemptions for specific penetration seals. See Licensing Action Report in Attachment K of this Report.	NRC Exemption dated August 21, 1989, NRC Exemption to various Appendix R Requirements, 8/21/1989 DPC 1435.00-00-0006 UFSAR Section 9.5.1.4.3 Drawing Series O-310 K and L, Fire Protection Plan & Fire, Flood, & Pressure Boundaries SLC 16.9.5, 1/30/2000 NRC Letter dated April 14, 1981, 4/14/1981 OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007 OSC-7350, Att. 02, ONS Penetration Seal Database and 86-10 Evaluations, Rev. 6, 11/30/2004	
		Comply by Previous Licensee Evaluation	The Penetration Seal Database and 86-10 Evaluation calculation document the acceptability of the station penetration seals	OSC-7350, Att. 02, ONS Penetration Seal Database and 86-10 Evaluations, Rev. 6, 11/30/2004	
		Further Action Required	Upon completion of the Nuclear Safety Capability Transition, identify barriers required to meet the nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action). Review credited penetration seals to		

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
			ensure they are evaluated in Calculation OSC-7350.		

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.11.4	Upon completion of Chapter 4 work, identify barriers credited for compliance, PRA, defense-in-depth or as part of the change evaluation process. Review if credited penetration seals are evaluated by Calculation OSC-7350.		Open	4/24/2008

Corrective Action Reference	PIP 0-08-2163
Include in LAR/TR	Yes
Change Eval / Mod Reference	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
3.11.5 Electrical Raceway Fire Barrier Systems (ERFBS).	3.11.5* Electrical Raceway Fire Barrier Systems (ERFBS). 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 needs to 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. Exception No. 1: When the temperatures inside the fire barrier system exceed the maximum temperature allowed by the acceptance criteria of Generic Letter 86-10, "Fire Endurance Acceptance Test Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Training Within the Same Fire Area," Supplement 1, functionality of the cable at these elevated temperatures shall be demonstrated. Qualification demonstration of these cables shall be performed in accordance with the electrical testing requirements of Generic Letter 86-10, Supplement 1, Attachment 1, "Attachment Methods for Demonstrating Functionality of Cables Protected by Raceway Fire Barrier Systems During and After Fire Endurance Test Exposure." Exception No. 2: ERFBS systems employed prior to the issuance of Generic Letter 86-10, Supplement 1, are acceptable providing that the system successfully met the limiting end point temperature requirements as specified by the AHJ at the time of acceptance.	Further Action Required	Upon completion of the Nuclear Safety Capability Transition, identify ERFBS required to meet the nuclear safety performance criteria (compliance with deterministic criteria, or as a defense-in-depth feature for a change evaluation or transitioning licensing action). Determine if credited ERFBS is rated appropriately.		
		N/A	The Oconee design does not currently utilize ERFBS	OSS-0254.00-00-4008, Fire Protection Design Basis Document, Rev. 16, 3/15/2007	

Table B-1 - NFPA 805 Ch. 3 Transition

NFPA 805 Ch. 3 Ref.	Requirements/Guidance	Compliance Statement	Compliance Basis	Reference Document	Document Detail
Open Item ID	**Open Item Description**		**Disposition**	**Open/Closed**	**Date Entered**
3.11.5	Upon completion of Chapter 4 work, identify barriers credited for compliance, PRA, defense-in-depth or as part of the change evaluation process. Review if credited ERFBS are rated appropriately.			Open	4/24/2008
Corrective Action Reference	PIP 0-08-2163				
Include in LAR/TR	Yes				
Change Eval / Mod Reference					

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

111 Pages Attached

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

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

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

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

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	A deterministic methodology is utilized to assess conformance with Appendix R.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	3.4.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

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

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Safe shutdown systems and functions are identified. Safe shutdown success paths are identified. Logic diagrams are utilized to determine if sufficient safe shutdown functions are available to achieve safe shutdown goals.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1 [B, Goals] Safe Shutdown Systems and Path Development	The goal of post-fire safe shutdown is to assure that a one train of shutdown systems, structures, and components remains free of fire damage for a single fire in any single plant fire area. This goal is accomplished by determining those functions important to achieve and maintain hot shutdown. Safe shutdown systems are selected so that the capability to perform these required functions is a part of each safe shutdown path. The functions important to post-fire safe shutdown generally include, but are not limited to the following: Reactivity control Pressure control systems Inventory control systems Decay heat removal systems Process monitoring Support systems o Electrical systems o Cooling systems These functions are of importance because they have a direct bearing on the safe shutdown goal of being able to achieve and maintain hot shutdown which ensures the integrity of the fuel, the reactor pressure vessel, and the primary containment. If these functions are preserved, then the plant will be safe because the fuel, the reactor and the primary containment will not be damaged. By assuring that this equipment is not damaged and remains functional, the protection of the health and safety of the public is assured.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Safe shutdown performance goals are translated into safe shutdown success paths and are identified and utilized to ensure safe shutdown can be achieved. Logic diagrams are used to assess safe shutdown success paths.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1 [C, Spurious Operations] Safe Shutdown Systems and Path Development	In addition to the above listed functions, Generic Letter 81-12 specifies consideration of associated circuits with the potential for spurious equipment operation and/or loss of power source, and the common enclosure failures. Spurious operations/actuations can affect the accomplishment of the post-fire safe shutdown functions listed above. Typical examples of the effects of the spurious operations of concern are the following: o A loss of reactor pressure vessel/reactor coolant inventory in excess of the safe shutdown makeup capability o A flow loss or blockage in the inventory makeup or decay heat removal systems being used for the required safe shutdown path. Spurious operations are of concern because they have the potential to directly affect the ability to achieve and maintain hot shutdown, which could affect the fuel and cause damage to the reactor pressure vessel or the primary containment. Common power source and common enclosure concerns could also affect these and must be addressed.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Spurious operations are considered in both the selection of safe shutdown functions and systems as well as the cabling associated with the components relied upon to achieve those functions.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1.2 , 3.4.2 and 8.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1 Criteria / Assumptions	The following criteria and assumptions may be considered when identifying systems available and necessary to perform the required safe shutdown functions and combining these systems into safe shutdown paths.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.1 [GE BWR Paths]	[BWR] GE Report GE-NE-T43-00002-00-01-R01 entitled "Original Safe Shutdown Paths For The BWR" addresses the systems and equipment originally designed into the GE boiling water reactors (BWRs) in the 1960s and 1970s, that can be used to achieve and maintain safe shutdown per Section III.G.1 of 10CFR 50, Appendix R. Any of the shutdown paths (methods) described in this report are considered to be acceptable methods for achieving redundant safe shutdown.

Applicability	Comments
Not Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Applicable	B&W PWR				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.2 [SRVs / LP Systems]	[BWR] GE Report GE-NE-T43-00002-00-03-R01 provides a discussion on the BWR Owners' Group (BWROG) position regarding the use of Safety Relief Valves (SRVs) and low pressure systems (LPCI/CS) for safe shutdown. The BWROG position is that the use of SRVs and low pressure systems is an acceptable methodology for achieving redundant safe shutdown in accordance with the requirements of 10CFR50 Appendix R Sections III.G.1 and III.G.2. The NRC has accepted the BWROG position and issued an SER dated Dec. 12, 2000.

Applicability	Comments
Not Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Applicable	B&W PWR				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.3 [Pressurizer Heaters]	[PWR] Generic Letter 86-10, Enclosure 2, Section 5.3.5 specifies that hot shutdown can be maintained without the use of pressurizer heaters (i.e., pressure control is provided by controlling the makeup/charging pumps). Hot shutdown conditions can be maintained via natural circulation of the RCS through the steam generators. The cooldown rate must be controlled to prevent the formation of a bubble in the reactor head. Therefore, feedwater (either auxiliary or emergency) flow rates as well as steam release must be controlled.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	The use of PZR heaters are not required for Oconee but they will be used if available. The formation of a bubble may occur but will not interrupt natural circulation based on AREVA EOP Technical Bases Document. Natural circulation cool down utilizing emergency feedwater for a control room shutdown and SSF Aux service water for a SSF shutdown is performed. Flow rates and steam release rates are controlled by throttling control valves.			74-1152414-10, AREVA Emergency Operating Procedures Technical Bases Document	
				AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Rev. 38, 8/16/2007	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P
				D 1982-09-20, RAI On ONS Standby Shutdown Facility, 9/20/1982	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.4 [Alternative Shutdown Capability]	The classification of shutdown capability as alternative shutdown is made independent of the selection of systems used for shutdown. Alternative shutdown capability is determined based on an inability to assure the availability of a redundant safe shutdown path. Compliance to the separation requirements of Sections III.G.1 and III.G.2 may be supplemented by the use of manual actions to the extent allowed by the regulations and the licensing basis of the plant, repairs (cold shutdown only), exemptions, deviations, GL 86-10 fire hazards analyses or fire protection design change evaluations, as appropriate. These may also be used in conjunction with alternative shutdown capability.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	Oconee utilizes a dedicated Standby Shutdown Facility (SSF) for the following fire areas at Oconee: o BOP o BH12 o BH3 The transfer of control to the SSF of the equipment credited for a SSF shutdown isolates the systems and equipment from the affects of a fire for the above fire areas. The intent of the guidance is that dedicated cables and equipment credited for alternative shutdown is independent of the fire area of concern. Following transfer of control to the SSF, the dedicated equipment credited for a SSF shutdown meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008 UFSAR Section 9.6, Standby Shutdown Facility	Section 11

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.5 [Initial Conditions]	At the onset of the postulated fire, all safe shutdown systems (including applicable redundant trains) are assumed operable and available for post-fire safe shutdown. Systems are assumed to be operational with no repairs, maintenance, testing, Limiting Conditions for Operation, etc. in progress. The units are assumed to be operating at full power under normal conditions and normal lineups.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Same initial conditions are assumed by the safe shutdown analysis.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.6 [Other Events in Conjunction with Fire]	No Final Safety Analysis Report accidents or other design basis events (e.g. loss of coolant accident, earthquake), single failures or non-fire induced transients need be considered in conjunction with the fire.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	No accidents or other design basis events (i.e. loss of coolant accident, control rod misalignment accident, etc.), single failures or non-fire induced transients are considered in conjunction with the fire.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.7 [Offsite Power]	For the case of redundant shutdown, offsite power may be credited if demonstrated to be free of fire damage. Offsite power should be assumed to remain available for those cases where its availability may adversely impact safety (i.e., reliance cannot be placed on fire causing a loss of offsite power if the consequences of offsite power availability are more severe than its presumed loss). No credit should be taken for a fire causing a loss of offsite power. For areas where train separation cannot be achieved and alternative shutdown capability is necessary, shutdown must be demonstrated both where offsite power is available and where offsite power is not available for 72 hours.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	Oconee does not credit off-site power for redundant safe shutdown (i.e., Control Room shutdown) following a fire. Oconee relies upon Keowee hydro station to provide emergency onsite power in lieu of using offsite power. Offsite power has not been analyzed or demonstrated to be free of fire damage for redundant shutdown. The cascading power supply analysis determines fire impact to credited power sources and is utilized in the analysis of fire areas for safe shutdown. This analysis ensures power is available to operate credited safe shutdown equipment. The intent of the guidance is to ensure that if offsite power is credited for redundant safe shutdown equipment that it is demonstrated to be available. Also for cases where offsite power could adversely impact safe shutdown it is assumed to be available. Since Oconee does not credit offsite power, it is not required to demonstrated it is free of fire damage; thus Oconee meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 8.4.3, 11.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.8 [Safety-Related Equipment]	Post-fire safe shutdown systems and components are not required to be safety-related.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Credited safe shutdown components are not always safety related. Most are safety related due to their credited emergency function(s).			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment B

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.9 [72 Hour Coping]	The post-fire safe shutdown analysis assumes a 72-hour coping period starting with a reactor scram/trip. Fire-induced impacts that provide no adverse consequences to hot shutdown within this 72-hour period need not be included in the post-fire safe shutdown analysis. At least one train can be repaired or made operable within 72 hours using onsite capability to achieve cold shutdown.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	72 hour coping period was implicitly analyzed based on the compliance strategy requirement to perform cold shutdown repairs within 72 hours. Procedures and analysis currently demonstrate ONS has the capability to meet this requirement. Note: NFPA 805 does not have any explicit requirements to achieve cold shutdown within 72 hours; therefore, NFPA-805 licensing will apply.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008 UFSAR Section 9.6, Standby Shutdown Facility	Section 3.4.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.10 [Manual / Automatic Initiation of Systems]	Manual initiation from the main control room or emergency control stations of systems required to achieve and maintain safe shutdown is acceptable where permitted by current regulations or approved by NRC; automatic initiation of systems selected for safe shutdown is not required but may be included as an option.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Oconee does not credit the automatic initiation of systems for safe shutdown. Systems will be manually initiated from the control room or emergency control stations. The SSF is an alternate shutdown location and is manually initiated.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.4.2 and 4.16

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.1.11 [Multiple Affected Units]	Where a single fire can impact more than one unit of a multi-unit plant, the ability to achieve and maintain safe shutdown for each affected unit must be demonstrated.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The affects of fire on the ability to achieve and maintain safe shutdown of all three units have been evaluated for all fire areas in the safe shutdown analysis. The analysis has demonstrated this ability for each unit separately and for all three units collectively where required.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.4.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2 Shutdown Functions	The following discussion on each of these shutdown functions provides guidance for selecting the systems and equipment required for safe shutdown. For additional information on BWR system selection, refer to GE Report GE-NE-T43-00002-00-01-R01 entitled "Original Safe Shutdown Paths for the BWR."

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic Paragraph. Alignment discussed in subsequent sections.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.1 Reactivity Control	[BWR] Control Rod Drive System The safe shutdown performance and design requirements for the reactivity control function can be met without automatic scram/trip capability. Manual scram/reactor trip is credited. The post-fire safe shutdown analysis must only provide the capability to manually scram/trip the reactor. [PWR] Makeup/Charging There must be a method for ensuring that adequate shutdown margin is maintained by ensuring borated water is utilized for RCS makeup/charging.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	For a SSF shutdown, borated water from the SFP using the RCMU pump is used to maintain shutdown margin following automatic or manual reactor trip. For a shutdown from the control room, borated water from the BWST using normal injection (HPI) is used to maintain shutdown margin. Minimum Boron concentration in the SFP and BWST has been calculated to ensure shutdown margins for the Appendix R event.			OSC-7706	
				OSC-2282	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 11.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.2 Pressure Control Systems	The systems discussed in this section are examples of systems that can be used for pressure control. This does not restrict the use of other systems for this purpose. [BWR] Safety Relief Valves (SRVs) The SRVs are opened to maintain hot shutdown conditions or to depressurize the vessel to allow injection using low pressure systems. These are operated manually. Automatic initiation of the Automatic Depressurization System is not a required function. [PWR] Makeup/Charging RCS pressure is controlled by controlling the rate of charging/makeup to the RCS. Although utilization of the pressurizer heaters and/or auxiliary spray reduces operator burden, neither component is required to provide adequate pressure control. Pressure reductions are made by allowing the RCS to cool/shrink, thus reducing pressurizer level/pressure. Pressure increases are made by initiating charging/makeup to maintain pressurizer level/pressure. Manual control of the related pumps is acceptable.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Though the use of PZR HTRs, the PORV, and Aux Spray is preferred, ONS credits use of makeup/charging to control RC pressure.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 11.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.3 Inventory Control	[BWR] Systems selected for the inventory control function should be capable of supplying sufficient reactor coolant to achieve and maintain hot shutdown. Manual initiation of these systems is acceptable. Automatic initiation functions are not required. [PWR]: Systems selected for the inventory control function should be capable of maintaining level to achieve and maintain hot shutdown. Typically, the same components providing inventory control are capable of providing pressure control. Manual initiation of these systems is acceptable. Automatic initiation functions are not required.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Reactor makeup from the SSF using the SSF RC Makeup Pump taking suction from the SFP or normal injection (HPI) via BWST is used to maintain reactor coolant inventory levels. Oconee assumes manual initiation of these systems.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 11.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.4 Decay Heat Removal	[BWR] Systems selected for the decay heat removal function(s) should be capable of: o Removing sufficient decay heat from primary containment, to prevent containment over-pressurization and failure. o Satisfying the net positive suction head requirements of any safe shutdown systems taking suction from the containment (suppression pool). o Removing sufficient decay heat from the reactor to achieve cold shutdown. [PWR] Systems selected for the decay heat removal function(s) should be capable of: o Removing sufficient decay heat from the reactor to reach hot shutdown conditions. Typically, this entails utilizing natural circulation in lieu of forced circulation via the reactor coolant pumps and controlling steam release via the Atmospheric Dump valves. o Removing sufficient decay heat from the reactor to reach cold shutdown conditions. This does not restrict the use of other systems.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	For a shutdown from the SSF, the SSF ASW pump feeds both steam generators to remove decay heat under natural circulation conditions. For a control room shutdown one of the MDEFW pumps is used to feed one of the steam generators to remove decay heat. The MSRVs are used for HSB. The main steam atmospheric dump valves are utilized for decay heat removal for transitioning to cold shutdown until shutdown cooling from LPI can then be initiated for maintaining cold shutdown conditions.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 11.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.5 Process Monitoring	The process monitoring function is provided for all safe shutdown paths. IN 84-09, Attachment 1, Section IX "Lessons Learned from NRC Inspections of Fire Protection Safe Shutdown Systems (10CFR50 Appendix R)" provides guidance on the instrumentation acceptable to and preferred by the NRC for meeting the process monitoring function. This instrumentation is that which monitors the process variables necessary to perform and control the functions specified in Appendix R Section III.L.1. Such instrumentation must be demonstrated to remain unaffected by the fire. The IN 84-09 list of process monitoring is applied to alternative shutdown (III.G.3). IN 84-09 did not identify specific instruments for process monitoring to be applied to redundant shutdown (III.G.1 and III.G.2). In general, process monitoring instruments similar to those listed below are needed to successfully use existing operating procedures (including Abnormal Operating Procedures). BWR o Reactor coolant level and pressure o Suppression pool level and temperature o Emergency or isolation condenser level o Diagnostic instrumentation for safe shutdown systemsoLevel indication for tanks needed for safe shutdown PWR o Reactor coolant temperature (hot leg / cold leg) o Pressurizer pressure and level o Neutron flux monitoring (source range) o Level indication for tanks needed for safe shutdown o Steam generator level and pressure o Diagnostic instrumentation for safe shutdown systems The specific instruments required may be based on operator preference, safe shutdown procedural guidance strategy (symptomatic vs. prescriptive), and systems and paths selected for safe shutdown.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

Aligns with Intent	Process monitoring has been analyzed on a functional level for safe shutdown systems (RCS temp, PZR level and temp, SG level, diagnostic instruments and tank level instruments). BWST level is provided for a control room shutdown, the SFP level at the SSF is related to the suction pressure of the RCMU pump. An exemption for boron sampling in lieu of neutron source range monitoring instrumentation has been granted for the SSF, therefore neutron source range instrumentation has not been provided or analyzed for the SSF. Steam generator pressure instruments are also not provided in the SSF. An exemption for steam generator pressure indication has been granted for the SSF. Both Neutron Instrumentation and steam generator pressure indication are available in the Main Control Room. The intent of the guidance is that indication for the above parameters be provided. The NRC has accepted the lack of SSF indication for two of the parameters, therefore, based on the exemptions, Oconee aligns with the intent of the guidance.	1983-08-31 NRC SER, Nuclear Instrumentation and SG Pressure, 8/31/1983	
		EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 11.4 and Attachment P

Table B-2 Nuclear Safety Capability Assessment Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.6 Support Systems	[Blank Heading - No specific guidance]
Applicability	**Comments**

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic Heading alignment discussed in subsequent paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.6.1 Electrical Systems	AC Distribution System Power for the Appendix R safe shutdown equipment is typically provided by a medium voltage system such as 4.16 KV Class 1E busses either directly from the busses or through step down transformers/load centers/distribution panels for 600, 480 or 120 VAC loads. For redundant safe shutdown performed in accordance with the requirements of Appendix R Section III.G.1 and 2, power may be supplied from either offsite power sources or the emergency diesel generator depending on which has been demonstrated to be free of fire damage. No credit should be taken for a fire causing a loss of offsite power. Refer to Section 3.1.1.7. DC Distribution System Typically, the 125VDC distribution system supplies DC control power to various 125VDC control panels including switchgear breaker controls. The 125VDC distribution panels may also supply power to the 120VAC distribution panels via static inverters. These distribution panels typically supply power for instrumentation necessary to complete the process monitoring functions. For fire events that result in an interruption of power to the AC electrical bus, the station batteries are necessary to supply any required control power during the interim time period required for the diesel generators to become operational. Once the diesels are operational, the 125 VDC distribution system can be powered from the diesels through the battery chargers. [BWR] Certain plants are also designed with a 250VDC Distribution System that supplies power to Reactor Core Isolation Cooling and/or High Pressure Coolant Injection equipment. The DC control centers may also supply power to various small horsepower Appendix R safe shutdown system valves and pumps. If the DC system is relied upon to support safe shutdown without battery chargers being available, it must be verified that sufficient battery capacity exists to support the necessary loads for sufficient time (either until power is restored, or the loads are no longer required to operate).

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

Aligns with Intent	Offsite power is not credited for a control room shutdown and is not credited beyond the first 10 minutes of a fire event for a SSF shutdown; however, if available it is provided to safe shutdown equipment through main feeder buses (MFBs). Oconee does not have onsite diesel generators. Emergency onsite power to the MFBs is provided from the Keowee Hydro power station. Both AC and DC power supplies are analyzed for their availability and capacity to support the required safe shutdown loads. Oconee aligns with this guidance except Keowee Hydro power station is relied upon for emergency power instead of onsite diesel generators. The safe shutdown equipment operated from the alternate shutdown location, SSF, has its own diesel supplied power and DC systems.	EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.6.2 Cooling Systems [Main Section]	Various cooling water systems may be required to support safe shutdown system operation, based on plant-specific considerations. Typical uses include: o RHR/SDC/DH Heat Exchanger cooling water o Safe shutdown pump cooling (seal coolers, oil coolers) o Diesel generator cooling o HVAC system cooling water

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Required cooling system components have been included in the SSEL. The EIR assumes that cooling systems are capable of performing their design function and are not out of service or degraded at the onset of the fire. If free of fire damage, they are capable of performing their cooling function for safe shutdown.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 11.4 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.2.6.2 Cooling Systems [HVAC]	HVAC Systems HVAC Systems may be required to assure that safe shutdown equipment remains within its operating temperature range, as specified in manufacturer's literature or demonstrated by suitable test methods, and to assure protection for plant operations staff from the effects of fire (smoke, heat, toxic gases, and gaseous fire suppression agents). HVAC systems may be required to support safe shutdown system operation, based on plant-specific configurations. Typical uses include: o Main control room, cable spreading room, relay room o ECCS pump compartments o Diesel generator rooms o Switchgear rooms Plant-specific evaluations are necessary to determine which HVAC systems are essential to safe shutdown equipment operation.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Required HVAC components have been included on the SSEL based on functional requirements and feedback from Oconee System Engineering. This includes cooling for the control room, cable room, and equipment rooms. The SSF has an independent HVAC system which provides cooling for the SSF and SSF equipment, including the diesel generator and switchgear rooms.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P and Section 11.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.3 Methodology for Shutdown System Selection	Refer to Figure 3-2 for a flowchart illustrating the various steps involved in selecting safe shutdown systems and developing the shutdown paths. The following methodology may be used to define the safe shutdown systems and paths for an Appendix R analysis: [Refer to hard copy of NEI 00-01 for Figure 3-2]

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Alignment is discussed in subsequent paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.3.1 Identify safe shutdown functions	Review available documentation to obtain an understanding of the available plant systems and the functions required to achieve and maintain safe shutdown. Documents such as the following may be reviewed: o Operating Procedures (Normal, Emergency, Abnormal) o System descriptions o Fire Hazard Analysis o Single-line electrical diagrams o Piping and Instrumentation Diagrams (P&IDs) o [BWR] GE Report GE-NE-T43-00002-00-01-R02 entitled "Original Shutdown Paths for the BWR"

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Safe shutdown functions, systems and components needed to satisfy the safe shutdown performance goals were identified from available plant documentation.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.3.2 Identify Combinations of Systems that Satisfy Each Safe Shutdown Function	Given the criteria/assumptions defined in Section 3.1.1, identify the available combinations of systems capable of achieving the safe shutdown functions of reactivity control, pressure control, inventory control, decay heat removal, process monitoring, and support systems such as electrical and cooling systems (refer to Section 3.1.2). This selection process does not restrict the use of other systems. In addition to achieving the required safe shutdown functions, consider spurious operations and power supply issues that could impact the required safe shutdown function.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Safe shutdown functions, systems and components needed to satisfy the safe shutdown performance goals were selected using the criteria and assumptions of NEI 00-01, Sections 3.1.1 and 3.1.2.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4 and Attachment P

Table B-2 Nuclear Safety Capability Assessment Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.3.3 Define Combinations of Systems for Each Safe Shutdown Path	Select combinations of systems with the capability of performing all of the required safe shutdown functions and designate this set of systems as a safe shutdown path. In many cases, safe shutdown paths may be defined on a divisional basis since the availability of electrical power and other support systems must be demonstrated for each path.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Safe shutdown functions, systems and components needed to satisfy the safe shutdown performance goals were identified and placed into safe shutdown logic diagrams to show success paths.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 11.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.1.3.4 Assign Shutdown Paths to Each Combination of Systems	Assign a path designation to each combination of systems. The path will serve to document the combination of systems relied upon for safe shutdown in each fire area. Refer to Attachment 1 to this document (NEI 00-01) for an example of a table illustrating how to document the various combinations of systems for selected shutdown paths.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	Safe shutdown logic diagrams were utilized to show success paths for the various safe shutdown functions. Success paths were designated for each system and performance goal. The example in the attachment showed designating the equipment for 3 discrete safe shutdown success paths. Oconee did not assign a 'path designation' to each combination of systems or equipment, instead the logic diagrams provided numerous combinations of 'success paths' that could be used to achieve safe shutdown. Oconee then credited one combination of success paths for each fire area. This meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4.2, 11.4 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2 Safe Shutdown Equipment Selection	The previous section described the methodology for selecting the systems and paths necessary to achieve and maintain safe shutdown for an exposure fire event (see Section 5.0 DEFINITIONS for "Exposure Fire"). This section describes the criteria/assumptions and selection methodology for identifying the specific safe shutdown equipment necessary for the systems to perform their Appendix R function. The selected equipment should be related back to the safe shutdown systems that they support and be assigned to the same safe shutdown path as that system. The list of safe shutdown equipment will then form the basis for identifying the cables necessary for the operation or that can cause the maloperation of the safe shutdown systems.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Alignment discussed in subsequent sections.				

Table B-2 Nuclear Safety Capability Assessment Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1 Criteria / Assumptions	Consider the following criteria and assumptions when identifying equipment necessary to perform the required safe shutdown functions:

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Alignment discussed in subsequent paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1.1 [Primary Secondary Components]	3.2.1.1 Safe shutdown equipment can be divided into two categories. Equipment may be categorized as (1) primary components or (2) secondary components. Typically, the following types of equipment are considered to be primary components: o Pumps, motor operated valves, solenoid valves, fans, gas bottles, dampers, unit coolers, etc. o All necessary process indicators and recorders (i.e., flow indicator, temperature indicator, turbine speed indicator, pressure indicator, level recorder) o Power supplies or other electrical components that support operation of primary components (i.e., diesel generators, switchgear, motor control centers, load centers, power supplies, distribution panels, etc.). Secondary components are typically items found within the circuitry for a primary component. These provide a supporting role to the overall circuit function. Some secondary components may provide an isolation function or a signal to a primary component via either an interlock or input signal processor. Examples of secondary components include flow switches, pressure switches, temperature switches, level switches, temperature elements, speed elements, transmitters, converters, controllers, transducers, signal conditioners, hand switches, relays, fuses and various instrumentation devices. Determine which equipment should be included on the Safe Shutdown Equipment List (SSEL). As an option, include secondary components with a primary component(s) that would be affected by fire damage to the secondary component. By doing this, the SSEL can be kept to a manageable size and the equipment included on the SSEL can be readily related to required post-fire safe shutdown systems and functions.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	The dividing of equipment into 2 categories approach was used at Oconee; 'primary' components were identified and added to the SSEL, 'secondary' components (referred to as subcomponents) were grouped together with the primary components. Although some subcomponents were not individually identified (i.e., relays, fuses, hand switches, etc), the cable which connected to the subcomponents were identified and assigned to the primary components. In some instances, components were not captured by the cable selection process but were captured within the cascading interlocks analysis as pseudo-components. The affects of fire on these pseudo components was evaluated where appropriate. Oconee aligns with the above guidance except the additional category of 'pseudo' components is used. Examples of pseudo components are ES, AFIS, ICC, and ICS.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.1 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1.2 [Fire Damage to Mechanical Components (not electrically supervised)]	3.2.1.2 Assume that exposure fire damage to manual valves and piping does not adversely impact their ability to perform their pressure boundary or safe shutdown function (heat sensitive piping materials, including tubing with brazed or soldered joints, are not included in this assumption). Fire damage should be evaluated with respect to the ability to manually open or close the valve should this be necessary as a part of the post-fire safe shutdown scenario.

Applicability

Applicable

Comments

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align	Safe Shutdown analysis assumptions for post-fire integrity of mechanical components to function as pressure boundaries are essentially identical. No damage to packing or gaskets is assumed. The analysis assumes no damage to manual valves. Potential fire damage has not been specifically evaluated in regard to the ability to manually operate the valves post fire.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4 and Attachment P

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.2.1.2	Potential fire damage has not been specifically evaluated in regard to the ability to manually operate valves post fire.	Evaluation needed	Open	5/23/2008

Corrective Action Reference

PIP O-08-02444

Include in LAR/TR

Yes

Change Eval / Modification Reference

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1.3 [Manual Valve Positions]	Assume that manual valves are in their normal position as shown on P&IDs or in the plant operating procedures.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Manual valves are assumed in their normal operating position from the operating procedures and other references.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1.4 [Check Valves]	Assume that a check valve closes in the direction of potential flow diversion and seats properly with sufficient leak tightness to prevent flow diversion. Therefore, check valves do not adversely affect the flow rate capability of the safe shutdown systems being used for inventory control, decay heat removal, equipment cooling or other related safe shutdown functions.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Safe Shutdown analysis assumptions for post-fire integrity of check valves is functionally identical.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1.5 [Instrument Failures]	Instruments (e.g., resistance temperature detectors, thermocouples, pressure transmitters, and flow transmitters) are assumed to fail upscale, midscale, or downscale as a result of fire damage, whichever is worse. An instrument performing a control function is assumed to provide an undesired signal to the control circuit.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Instruments are assumed to fail in the worst case providing an undesirable result.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1.6 [Spurious Components]	Identify equipment that could spuriously operate or mal-operate and impact the performance of equipment on a required safe shutdown path during the equipment selection phase. Consider Bin 1 of RIS 2004-03 during the equipment identification process.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	Spurious operation was considered in identification of SSEL components. RIS 2004-03 Bin 1 circuit configurations are summarized as conductor-to-conductor shorts within a multiconductor cable, and thermoplastic-cable-to-thermoplastic-cable interactions. Conductor-to-conductor shorts within a multiconductor cable configurations were considered for power, control, and instrumentation circuits whose fire-induced failures could prevent operation of safe shutdown equipment or through maloperation cause a flow diversion, loss of coolant, or other scenario that could significantly impact the ability to achieve and maintain hot shutdown. Oconee aligns with the intent of this guidance because thermoplastic-cable-to-thermoplastic-cable interactions are not postulated due to Oconee cables being armor jacketed which would preclude cable-to-cable interactions.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4, 8.2, 8.4 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.1.7 [Instrument Tubing]	Identify instrument tubing that may cause subsequent effects on instrument readings or signals as a result of fire. Determine and consider the fire area location of the instrument tubing when evaluating the effects of fire damage to circuits and equipment in the fire area.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Instrument tubing has been included in the evaluation for effects from fire.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.2 and Attachment O

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.2 Methodology for Equipment Selection	Refer to Figure 3-3 for a flowchart illustrating the various steps involved in selecting safe shutdown equipment. Use the following methodology to select the safe shutdown equipment for a post-fire safe shutdown analysis: [Refer to hard copy of NEI 00-01 for Figure 3-3]

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic Paragraph. Alignment discussed in subsequent paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.2.1 Identify the System Flow Path for Each Shutdown Path	Mark up and annotate a P&ID to highlight the specific flow paths for each system in support of each shutdown path. Refer to Attachment 2 for an example of an annotated P&ID illustrating this concept.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	P&IDs were marked up and used up to determine flow and diversion paths which were then translated into Safe Shutdown success path logic diagrams. These logic diagrams were then used to identify potential SSEL components. These P&ID drawings were not maintained as part of the safe shutdown analysis. Instead, Oconee simplified flow diagrams (OSFDs) are marked up and annotated to designate specific flow paths for each system. This approach meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.2.2 Identify the Equipment in Each Safe Shutdown System Flow Path Including Equipment That May Spuriously Operate and Affect System Operation	Review the applicable documentation (e.g. P&IDs, electrical drawings, instrument loop diagrams) to assure that all equipment in each system's flow path has been identified. Assure that any equipment that could spuriously operate and adversely affect the desired system function(s) is also identified. If additional systems are identified which are necessary for the operation of the safe shutdown system under review, include these as systems required for safe shutdown. Designate these new systems with the same safe shutdown path as the primary safe shutdown system under review (Refer to Figure 3-1).

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	P&IDs and electrical one lines were marked up to determine flow and diversion paths for safe shutdown functions and to identify potential SSEL components including components that could spurious operate and affect the desired system function of SSD equipment. Any new SSD 'success paths' identified were defined on logic diagrams, however the technique of designating a set number of 'safe shutdown paths' was not used. The Oconee approach of providing numerous 'success paths' meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.2.3 Develop a List of Safe Shutdown Equipment and Assign the Corresponding System and Safe Shutdown Path(s) Designation to Each.	Prepare a table listing the equipment identified for each system and the shutdown path that it supports. Identify any valves or other equipment that could spuriously operate and impact the operation of that safe shutdown system. Assign the safe shutdown path for the affected system to this equipment. During the cable selection phase, identify additional equipment required to support the safe shutdown function of the path (e.g., electrical distribution system equipment). Include this additional equipment in the safe shutdown equipment list. Attachment 3 to this document provides an example of a (SSEL). The SSEL identifies the list of equipment within the plant considered for safe shutdown and it documents various equipment-related attributes used in the analysis.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	P&IDs were marked up to determine flow and diversion paths for safe shutdown functions and to identify potential SSEL components including spurious operations. An iterative process was utilized to arrive at the final SSEL based on additional support components identified during the cable selection process (such as electrical distribution equipment). The table listing as identified in Attachment 3 was not utilized, since the ARTRAK database has its own data entry format, which provides the necessary equipment information. Also, equipment was not assigned a safe shutdown 'path'; instead safe shutdown logic diagrams denote system function 'success paths'. The Oconee approach meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.2.4 Identify Equipment Information Required for the Safe Shutdown Analysis	Collect additional equipment-related information necessary for performing the post-fire safe shutdown analysis for the equipment. In order to facilitate the analysis, tabulate this data for each piece of equipment on the SSEL. Refer to Attachment 3 to this document for an example of a SSEL. Examples of related equipment data should include the equipment type, equipment description, safe shutdown system, safe shutdown path, drawing reference, fire area, fire zone, and room location of equipment. Other information such as the following may be useful in performing the safe shutdown analysis: normal position, hot shutdown position, cold shutdown position, failed air position, failed electrical position, high/low pressure interface concern, and spurious operation concern.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	Plant design information on capability to meet safe shutdown functions were collected to the extent necessary to identify potential SSEL components including components required due to spurious operation concerns. An iterative process was utilized to arrive at the final SSEL based on additional support components identified during the cable selection process and review of plant design basis information. The required equipment information listed in Attachment 3 to NEI 00-01 is contained within the ARTRAK database except for 'safe shutdown path' and 'room location'. Equipment at Oconee was not assigned a 'safe shutdown path'; instead safe shutdown logic diagrams denote system function 'success paths'. The ARTRAK database includes fire area and zone but does not include room locations. All 'examples' of data listed are not required to perform a safe shutdown analysis. The Oconee approach meets the intent of the guidance.			ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4.2 and Attachment P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

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

NEI 00-01 Ref	NEI 00-01 Guidance
3.2.2.5 Identify Dependencies Between Equipment, Supporting Equipment, Safe Shutdown Systems and Safe Shutdown Paths.	In the process of defining equipment and cables for safe shutdown, identify additional supporting equipment such as electrical power and interlocked equipment. As an aid in assessing identified impacts to safe shutdown, consider modeling the dependency between equipment within each safe shutdown path either in a relational database or in the form of a Safe Shutdown Logic Diagram (SSLD). Attachment 4 provides an example of a SSLD that may be developed to document these relationships.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Safe Shutdown logic diagrams were utilized to assess the dependencies of equipment and systems on the ability to achieve the safe shutdown performance goals. Cascading power supply and cascading interlock analyses were developed to support this effort. Attachment 4 of NEI 00-01 was used in this effort.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1.2, 3.2, 3.4.2 and Attachments C, H& P

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

2.4.2.2.1 Circuits Required in Nuclear Safety Functions. Circuits required for the nuclear safety functions shall be identified. This includes circuits that are required for operation, that could prevent the operation, or that result in the maloperation of the equipment identified in 2.4.2.1. This evaluation shall consider fire-induced failure modes such as hot shorts (external and internal), open circuits, and shorts to ground, to identify circuits that are required to support the proper operation of components required to achieve the nuclear safety performance criteria, including spurious operation and signals. This will ensure that a comprehensive population of circuitry is evaluated.

2.4.2.2.2 Other Required Circuits. Other circuits that share common power supply and/or common enclosure with circuits required to achieve nuclear safety performance criteria shall be evaluated for their impact on the ability to achieve nuclear safety performance criteria.

(a) Common Power Supply Circuits. Those circuits whose fire-induced failure could cause the loss of a power supply required to achieve the nuclear safety performance criteria shall be identified. This situation could occur if the upstream protection device (i.e., breaker or fuse) is not properly coordinated with the downstream protection device.
(b) Common Enclosure Circuits. Those circuits that share enclosures with circuits required to achieve the nuclear safety performance criteria and whose fire-induced failure could cause the loss of the required components shall be identified. The concern is that the effects of a fire can extend outside of the immediate fire area due to fire-induced electrical faults on inadequately protected cables or via inadequately sealed fire area boundaries.

NEI 00-01 Ref	NEI 00-01 Guidance
3.3 Safe Shutdown Cable Selection and Location	This section provides industry guidance on the recommended methodology and criteria for selecting safe shutdown cables and determining their potential impact on equipment required for achieving and maintaining safe shutdown of an operating nuclear power plant for the condition of an exposure fire. The Appendix R safe shutdown cable selection criteria are developed to ensure that all cables that could affect the proper operation or that could cause the maloperation of safe shutdown equipment are identified and that these cables are properly related to the safe shutdown equipment whose functionality they could affect. Through this cable-to-equipment relationship, cables become part of the safe shutdown path assigned to the equipment affected by the cable.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1 Criteria / Assumptions	To identify an impact to safe shutdown equipment based on cable routing, the equipment must have cables that affect it identified. Carefully consider how cables are related to safe shutdown equipment so that impacts from these cables can be properly assessed in terms of their ultimate impact on safe shutdown system equipment. Consider the following criteria when selecting cables that impact safe shutdown equipment:

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1.1 [Cable Selection]	The list of cables whose failure could impact the operation of a piece of safe shutdown equipment includes more than those cables connected to the equipment. The relationship between cable and affected equipment is based on a review of the electrical or elementary wiring diagrams. To assure that all cables that could affect the operation of the safe shutdown equipment are identified, investigate the power, control, instrumentation, interlock, and equipment status indication cables related to the equipment. Consider reviewing additional schematic diagrams to identify additional cables for interlocked circuits that also need to be considered for their impact on the ability of the equipment to operate as required in support of post-fire safe shutdown. As an option, consider applying the screening criteria from Section 3.5 as a part of this section. For an example of this see Section 3.3.1.4.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The cables were selected using the component's electrical elementary diagram as a guide and performing a point to point review of the associated connection diagrams. During the cable selection process, a circuit fault analysis for each Appendix R component was not initially performed. This made the initial compliance analysis bounding. Further analysis to determine the effects of a fire induced hot short, open circuit and short to ground as applicable was performed during the fire area compliance assessment task.			ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2, 3.4 and 8.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1.2 [Cables Affecting Multiple Components]	In cases where the failure (including spurious actuations) of a single cable could impact more than one piece of safe shutdown equipment, include the cable with each piece of safe shutdown equipment.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	For control logic circuits where multiple components receive signals from common control logic, the control logic was analyzed as a primary component and a pseudo component was created for the logic with cables selected accordingly. This same methodology was used for similar circuit scenarios such as common power supplies. Whereas this approach does not assign the cable to each individual component, the effects on each component due to fire damage was evaluated. This meets the intent of the guidance.			ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2, and 8.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1.3 [Isolation Devices]	Electrical devices such as relays, switches and signal resistor units are considered to be acceptable isolation devices. In the case of instrument loops, review the isolation capabilities of the devices in the loop to determine that an acceptable isolation device has been installed at each point where the loop must be isolated so that a fault would not impact the performance of the safe shutdown instrument function.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The cables were selected using the component's electrical elementary diagram as a guide and performing a point to point review of the associated connection diagrams. During the cable selection process, a circuit fault analysis for each Appendix R component was not initially performed. However, all circuits/cables that are electrically connected to the circuit under analysis were then identified up to a credited isolation device including instrument loops.			ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2,, 3.4 and 8.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1.4 [Identify "Not Required" Cables]	Screen out cables for circuits that do not impact the safe shutdown function of a component (i.e., annunciator circuits, space heater circuits and computer input circuits) unless some reliance on these circuits is necessary. However, they must be isolated from the component's control scheme in such a way that a cable fault would not impact the performance of the circuit.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The cables were selected using the component's electrical elementary diagram as a guide and by performing a point to point review of the associated connection diagrams. During the cable selection process, a circuit fault analysis for each Appendix R component was performed. Cables associated with outputs from auxiliary contacts to computer points, annunciators or motor heaters were excluded from cable selection when it was concluded that the cable failure will not impact the primary component.			ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2, 3.4, and 8.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1.5 [Identification of Power Supplies]	For each circuit requiring power to perform its safe shutdown function, identify the cable supplying power to each safe shutdown and/or required interlock component. Initially, identify only the power cables from the immediate upstream power source for these interlocked circuits and components (i.e., the closest power supply, load center or motor control center). Review further the electrical distribution system to capture the remaining equipment from the electrical power distribution system necessary to support delivery of power from either the offsite power source or the emergency diesel generators (i.e., onsite power source) to the safe shutdown equipment. Add this equipment to the safe shutdown equipment list. Evaluate the power cables for this additional equipment for associated circuits concerns.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The cables were selected using the component's electrical elementary diagram as a guide and by performing a point to point review of the associated connection diagrams. During the cable selection process, power supplies and interlocks were identified. The cascading power supplies, pseudo-components created for power supply interlocks and the cascading interlocks all serve to identify required power supplies and their interconnections and dependencies to ensure credited safe shutdown components are supplied with motive electrical power.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2, 3.4, 8.2, 8.4, and Att. C, G& P
				ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1.6 [Auto Initiation Logic]	The automatic initiation logics for the credited post-fire safe shutdown systems are not required to support safe shutdown. Each system can be controlled manually by operator actuation in the main control room or emergency control station. If operator actions outside the MCR are necessary, those actions must conform to the regulatory requirements on manual actions. However, if not protected from the effects of fire, the fire-induced failure of automatic initiation logic circuits must not adversely affect any post-fire safe shutdown system function.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align	Automatic initiation logic was not credited for performance of safe shutdown functions. Manual operation of components from the Main Control Room, SSF or locally were identified during the fire area compliance assessment task as needed. To preclude adverse impact from automatic initiation logic circuits or control logic circuits where multiple components receive signals from common control logic, the control logic was analyzed as a primary component and a pseudo component was created for the logic with cables selected accordingly. This same methodology was used for similar circuit scenarios such as common power supplies. In this way the effects of a fire induced failure causing spurious component operation were fully evaluated. Local manual actions to achieve hot standby were used but are not within the regulatory requirements for a deterministic analysis; open items were created to address these actions. The use of these HSB manual actions does not align with the guidance.				

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.1.6	The use of manual actions for HSB does not meet regulatory requirements.	Resolve using NFPA-805	Open	5/23/2008

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.1.7 [Circuit Coordination]	Cabling for the electrical distribution system is a concern for those breakers that feed associated circuits and are not fully coordinated with upstream breakers. With respect to electrical distribution cabling, two types of cable associations exist. For safe shutdown considerations, the direct power feed to a primary safe shutdown component is associated with the primary component. For example, the power feed to a pump is necessary to support the pump. Similarly, the power feed from the load center to an MCC supports the MCC. However, for cases where sufficient branch-circuit coordination is not provided, the same cables discussed above would also support the power supply. For example, the power feed to the pump discussed above would support the bus from which it is fed because, for the case of a common power source analysis, the concern is the loss of the upstream power source and not the connected load. Similarly, the cable feeding the MCC from the load center would also be necessary to support the load center.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align	Proper coordination of common power supplies for all circuits was an assumption of the analysis. Oconee's existing coordination study does not include all SSEL related power supplies. The coordination study needs to be updated with the additional power supplies to ensure that the assumptions of the EIR remain valid.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.2

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.3.1.7	The circuit coordination analysis for Oconee needs to be updated. The assumption of circuit coordination in the safe shutdown analysis needs to be validated.	Revise analysis.	Open	4/8/2008

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.2 Associated Circuit Cables	Appendix R, Section III.G.2, requires that separation features be provided for equipment and cables, including associated nonsafety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve hot shutdown. The three types of associated circuits were identified in Reference 6.1.5 and further clarified in a NRC memorandum dated March 22, 1982 from R. Mattson to D. Eisenhut, Reference 6.1.6. They are as follows: o Spurious actuations o Common power source o Common enclosure.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.2 [A] Associated Circuit Cables - Cables Whose Failure May Cause Spurious Actuations	Safe shutdown system spurious actuation concerns can result from fire damage to a cable whose failure could cause the spurious actuation/mal-operation of equipment whose operation could affect safe shutdown. These cables are identified in Section 3.3.3 together with the remaining safe shutdown cables required to support control and operation of the equipment.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.2 [B] Associated Circuit Cables - Common Power Source Cables	The concern for the common power source associated circuits is the loss of a safe shutdown power source due to inadequate breaker/fuse coordination. In the case of a fire-induced cable failure on a non-safe shutdown load circuit supplied from the safe shutdown power source, a lack of coordination between the upstream supply breaker/fuse feeding the safe shutdown power source and the load breaker/fuse supplying the non-safe shutdown faulted circuit can result in loss of the safe shutdown bus. This would result in the loss of power to the safe shutdown equipment supplied from that power source preventing the safe shutdown equipment from performing its required safe shutdown function. Identify these cables together with the remaining safe shutdown cables required to support control and operation of the equipment. Refer to Section 3.5.2.4 for an acceptable methodology for analyzing the impact of these cables on post-fire safe shutdown.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.2 [C] Associated Circuit Cables - Common Enclosure Cables	The concern with common enclosure associated circuits is fire damage to a cable whose failure could propagate to other safe shutdown cables in the same enclosure either because the circuit is not properly protected by an isolation device (breaker/fuse) such that a fire-induced fault could result in ignition along its length, or by the fire propagating along the cable and into an adjacent fire area. This fire spread to an adjacent fire area could impact safe shutdown equipment in that fire area, thereby resulting in a condition that exceeds the criteria and assumptions of this methodology (i.e., multiple fires). Refer to Section 3.5.2.5 for an acceptable methodology for analyzing the impact of these cables on post-fire safe shutdown.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.3 Methodology for Cable Selection and Location	Refer to Figure 3-4 for a flowchart illustrating the various steps involved in selecting the cables necessary for performing a post-fire safe shutdown analysis. Use the following methodology to define the cables required for safe shutdown including cables that may cause associated circuits concerns for a post-fire safe shutdown analysis: [Refer to hard copy of NEI 00-01 for Figure 3-4]

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.3.1 Identify Circuits Required for the Operation of the Safe Shutdown Equipment	For each piece of safe shutdown equipment defined in section 3.2, review the appropriate electrical diagrams including the following documentation to identify the circuits (power, control, instrumentation) required for operation or whose failure may impact the operation of each piece of equipment: o Single-line electrical diagrams o Elementary wiring diagrams o Electrical connection diagrams o Instrument loop diagrams. For electrical power distribution equipment such as power supplies, identify any circuits whose failure may cause a coordination concern for the bus under evaluation. If power is required for the equipment, include the closest upstream power distribution source on the safe shutdown equipment list. Through the iterative process described in Figures 3-2 and 3-3, include the additional upstream power sources up to either the offsite or the emergency power source.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The circuits were identified utilizing the single line, elementary, and connection diagrams along with instrument loop drawings. The iterative process of figures 3-2 and 3-3 of NEI 00-01 were used to include upstream power sources. For a given safe shutdown component, all cables that had the potential to impact the function of the component were initially identified to ensure that a bounding population of cables was provided for compliance analysis. Only those cables which were adequately isolated from the component such as those associated with certain indicating lights and computer inputs were excluded.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.3.2 Identify Interlocked Circuits and Cables Whose Spurious Operation or Mal-operation Could Affect Shutdown	In reviewing each control circuit, investigate interlocks that may lead to additional circuit schemes, cables and equipment. Assign to the equipment any cables for interlocked circuits that can affect the equipment. While investigating the interlocked circuits, additional equipment or power sources may be discovered. Include these interlocked equipment or power sources in the safe shutdown equipment list (refer to Figure 3-3) if they can impact the operation of the equipment under consideration.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	For control logic circuits where multiple components receive signals from common control logic or interlocks, the control logic was analyzed as a primary component and a pseudo component was created on the SSEL for the logic with cables selected accordingly. Pseudo-components whose associated cabling can affect another primary component based on common power were identified in the cable selection for the affected component as an interlocked primary component. The cascading power supply and cascading interlocks analyses evaluate these interlocked components. The Oconee approach of assigning cables to 'pseudo' components instead of to the equipment under consideration meets the intent of the guidance.			ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2, 3.4, and 8.2

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.3.3 Assign Cables to the Safe Shutdown Equipment	Given the criteria/assumptions defined in Section 3.3.1, identify the cables required to operate or that may result in maloperation of each piece of safe shutdown equipment. Tabulate the list of cables potentially affecting each piece of equipment in a relational database including the respective drawing numbers, their revision and any interlocks that are investigated to determine their impact on the operation of the equipment. In certain cases, the same cable may support multiple pieces of equipment. Relate the cables to each piece of equipment, but not necessarily to each supporting secondary component. If adequate coordination does not exist for a particular circuit, relate the power cable to the power source. This will ensure that the power source is identified as affected equipment in the fire areas where the cable may be damaged.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align	Cables associated with SSEL components were selected in accordance with Section 3.3.1 and entered into ARTRAK for that component. In some instances where cables affected multiple components, pseudo components were used and cables were assigned to them instead of the primary equipment. ARTRAK also contains the direct and indirect power supplies for the safe shutdown components and any interlocks that could impact component operation. SSEL component cables were also associated with interlocks and power supplies. Coordination of power supplies was assumed when assigning cables to the safe shutdown equipment; an open item has been placed in the corrective action program to evaluate breaker coordination and resolve any issues if identified. Oconee does not meet the intent of the guidance since it did not consider inadequate breaker coordination when selecting cables.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2, 3.4, and 8.2
				ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

3.3.3.3	Breaker coordination was assumed when assigning cables to safe shutdown equipment. As a result, cables whose fire-induced failure may impact safe shutdown equipment were not identified.	Evaluate breaker coordination and assign additional cables to equipment as necessary.	Open	5/23/2008

Corrective Action Reference PIP O-08-02444

Include in LAR/TR Yes

Change Eval / Modification Reference

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5 Circuit Analysis and Evaluation	This section on circuit analysis provides information on the potential impact of fire on circuits used to monitor, control and power safe shutdown equipment. Applying the circuit analysis criteria will lead to an understanding of how fire damage to the cables may affect the ability to achieve and maintain post-fire safe shutdown in a particular fire area. This section should be used in conjunction with Section 3.4, to evaluate the potential fire-induced impacts that require mitigation. Appendix R Section III.G.2 identifies the fire-induced circuit failure types that are to be evaluated for impact from exposure fires on safe shutdown equipment. Section III.G.2 of Appendix R requires consideration of hot shorts, shorts-to-ground and open circuits.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1 Criteria / Assumptions	Apply the following criteria/assumptions when performing fire-induced circuit failure evaluations.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1.1 [Circuit Failure Types and Impact]	Consider the following circuit failure types on each conductor of each unprotected safe shutdown cable to determine the potential impact of a fire on the safe shutdown equipment associated with that conductor. o A hot short may result from a fire-induced insulation breakdown between conductors of the same cable, a different cable or from some other external source resulting in a compatible but undesired impressed voltage or signal on a specific conductor. A hot short may cause a spurious operation of safe shutdown equipment. o An open circuit may result from a fire-induced break in a conductor resulting in the loss of circuit continuity. An open circuit may prevent the ability to control or power the affected equipment. An open circuit may also result in a change of state for normally energized equipment. (e.g. [for BWRs] loss of power to the Main Steam Isolation Valve (MSIV) solenoid valves due to an open circuit will result in the closure of the MSIVs). Note that RIS 2004-03 indicates that open circuits, as an initial mode of cable failures, are considered to be of very low likelihood. The risk-informed inspection process will focus on failures with relatively high probabilities. o A short-to-ground may result from a fire-induced breakdown of a cable insulation system, resulting in the potential on the conductor being applied to ground potential. A short-to-ground may have all of the same effects as an open circuit and, in addition, a short-to-ground may also cause an impact to the control circuit or power train of which it is a part. Consider the three types of circuit failures identified above to occur individually on each conductor of each safe shutdown cable on the required safe shutdown path in the fire area.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	All combinations of circuit failures except Intercable hot shorts are considered and evaluated to determine if spurious component actuation can occur. Intercable hot shorts were not considered due to the use of armored cable at Oconee; the armor jacketing of the cables prevent conductors from one cable shorting to conductors of another cable. In some cases, circuit analysis did not have to be performed because the entire population of cables associated with a safe shutdown component was adequately separated as required by the regulations from redundant components and cabling. Oconee meets the intent of the guidance except cable-to-cable interactions were not considered because the armor jacketing of the cables preclude hot short interactions. Additionally cables which meet separation requirements are not postulated to fail, therefore performing circuit analysis was not required.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4 and 8.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1.2 [Circuit Contacts and Operational Modes]	Assume that circuit contacts are positioned (i.e., open or closed) consistent with the normal mode/position of the safe shutdown equipment as shown on the schematic drawings. The analyst must consider the position of the safe shutdown equipment for each specific shutdown scenario when determining the impact that fire damage to a particular circuit may have on the operation of the safe shutdown equipment.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Analysis assumes that circuit contacts are positioned (i.e., open or closed) consistent in the normal mode/position of the safe shutdown equipment as shown on the schematic drawings or defined by procedure.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4, 8.2 and 8.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1.3 [Duration of Circuit Failures]	Assume that circuit failure types resulting in spurious operations exist until action has been taken to isolate the given circuit from the fire area, or other actions have been taken to negate the effects of circuit failure that is causing the spurious actuation. The fire is not assumed to eventually clear the circuit fault. Note that RIS 2004-03 indicates that fire-induced hot shorts typically self-mitigate after a limited period of time.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align, but has previous approval	Spurious operation of valves are assumed not to occur due to a fire postulated within the first 10 minutes of the event. After 10 minutes spurious operations exist until actions have been taken to either isolate the affected circuit or negate the effects of the spurious operation.			D 1982-09-20, RAI On ONS Standby Shutdown Facility, 9/20/1982	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4
				FAQ 08-0051, Duration of Spurious Operation, Rev. draft, 4/15/2008	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1.4 [Cable Failure Configurations]	When both trains are in the same fire area outside of primary containment, all cables that do not meet the separation requirements of Section III.G.2 are assumed to fail in their worst case configuration.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	All unprotected cables and equipment within the fire area that did not meet the separation requirements of Section III.G.2 were assumed to fail in their worst case configuration.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.2 , 3.4 and 8.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1.5 [A, Circuit Failure Risk Assessment Guidance]	The following guidance provides the NRC inspection focus from Bin 1 of RIS 2004-03 in order to identify any potential combinations of spurious operations with higher risk significance. Bin 1 failures should also be the focus of the analysis; however, NRC has indicated that other types of failures required by the regulations for analysis should not be disregarded even if in Bin 2 or 3. If Bin 1 changes in subsequent revisions of RIS 2004-03, the guidelines in the revised RIS should be followed.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic Paragraph. Specific alignment discussed in subsequent reference sections.				

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.1.5.A	Due to ongoing industry issues related to this topic, an open item is created to track resolution of Multiple Spurious Operations per FAQ 07-0038.		Open	4/8/2008

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1.5 [B, Cable Failure Modes]	For multiconductor cables testing has demonstrated that conductor-to-conductor shorting within the same cable is the most common mode of failure. This is often referred to as "intra-cable shorting." It is reasonable to assume that given damage, more than one conductor-to-conductor short will occur in a given cable. A second primary mode of cable failure is conductor-to-conductor shorting between separate cables, commonly referred to as "inter-cable shorting." Inter-cable shorting is less likely than intra-cable shorting. Consistent with the current knowledge of fire-induced cable failures, the following configurations should be considered: A. For any individual multiconductor cable (thermoset or thermoplastic), any and all potential spurious actuations that may result from intra-cable shorting, including any possible combination of conductors within the cable, may be postulated to occur concurrently regardless of number. However, as a practical matter, the number of combinations of potential hot shorts increases rapidly with the number of conductors within a given cable. For example, a multiconductor cable with three conductors (3C) has 3 possible combinations of two (including desired combinations), while a five conductor cable (5C) has 10 possible combinations of two (including desired combinations), and a seven conductor cable (7C) has 21 possible combinations of two (including desired combinations). To facilitate an inspection that considers most of the risk presented by postulated hot shorts within a multiconductor cable, inspectors should consider only a few (three or four) of the most critical postulated combinations. B. For any thermoplastic cable, any and all potential spurious actuations that may result from intra-cable and inter-cable shorting with other thermoplastic cables, including any possible combination of conductors within or between the cables, may be postulated to occur concurrently regardless of number. (The consideration of thermoset cable inter-cable shorts is deferred pending additional research.) C. For cases involving the potential damage of more than one multiconductor cable, a maximum of two cables should be assumed to be damaged concurrently. The spurious actuations should be evaluated as previously described. The consideration of more than two cables being damaged (and subsequent spurious actuations) is deferred pending additional research. D. For cases involving direct current (DC) circuits, the potential spurious operation due to failures of the associated control cables (even if the spurious operation requires two concurrent hot shorts of the proper polarity, e.g., plus-to-plus and minus-to-minus) should be considered when the required source and target conductors are each located within the same multiconductor cable. E. Instrumentation Circuits. Required instrumentation circuits are beyond the scope of this associated circuit approach and must meet the same requirements as required power and control circuits. There is one case where an instrument circuit could potentially be considered an associated circuit. If fire-induced damage of an instrument circuit could prevent operation (e.g., lockout permissive signal) or cause maloperation (e.g., unwanted start/stop/reposition signal) of systems necessary to achieve and maintain hot shutdown, then the instrument circuit may be considered an associated circuit and handled accordingly.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

Aligns with Intent	A. Three types of circuit failures (intra-cable hot shorts, open circuits and shorts-to-ground) were considered to occur on each conductor of each safe shutdown cable associated with a component of the required safe shutdown path in each given fire area. If a complete circuit failure analysis was not performed, a conservative worst-case failure was assumed with respect to the required SSD component/system. B. Oconee has thermoplastic covering over its armored sheathing, but the conductor insulation is thermoset. Inter-cable hot shorts are not postulated. C. No limit is placed on the number of cables damaged by the fire, however multiple spurious operation is being resolved generically by the Industry via the FAQ process for NEI 04-02. D. DC circuit control cables are included in the analysis. Oconee does not have cable configurations where two concurrent hot shorts of the proper polarity within the same cable could short to cause spurious operation. Cable-to-cable hot shorts are not postulated for armor jacketed cables. E. Instrument cables are included in the analysis and associated with pseudo components for logic circuits. Oconee aligns with this guidance except for item B. Oconee meets the intent of the item B guidance except cable-to-cable interactions were not considered because the armor jacketing of the cables preclude hot short interactions.		EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2 , 3.4, 8.2, and 8.4.16

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.1.5.B	Due to ongoing industry issues related to this topic, an open item is created to track resolution of Multiple Spurious Operations per FAQ 07-0038.		Open	4/7/2008

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2 Types of Circuit Failures	Appendix R requires that nuclear power plants must be designed to prevent exposure fires from defeating the ability to achieve and maintain post-fire safe shutdown. Fire damage to circuits that provide control and power to equipment on the required safe shutdown path and any other equipment whose spurious operation/mal-operation could affect shutdown in each fire area must be evaluated for the effects of a fire in that fire area. Only one fire at a time is assumed to occur. The extent of fire damage is assumed to be limited by the boundaries of the fire area. Given this set of conditions, it must be assured that one redundant train of equipment capable of achieving hot shutdown is free of fire damage for fires in every plant location. To provide this assurance, Appendix R requires that equipment and circuits required for safe shutdown be free of fire damage and that these circuits be designed for the fire-induced effects of a hot short, short-to-ground, and open circuit. With respect to the electrical distribution system, the issue of breaker coordination must also be addressed. This section will discuss specific examples of each of the following types of circuit failures: o Open circuit o Short-to-ground o Hot short.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.1 Circuit Failures Due to an Open Circuit	This section provides guidance for addressing the effects of an open circuit for safe shutdown equipment. An open circuit is a fire-induced break in a conductor resulting in the loss of circuit continuity. An open circuit will typically prevent the ability to control or power the affected equipment. An open circuit can also result in a change of state for normally energized equipment. For example, a loss of power to the main steam isolation valve (MSIV) solenoid valves [for BWRs] due to an open circuit will result in the closure of the MSIV. NOTE: The EPRI circuit failure testing indicated that open circuits are not likely to be the initial fire-induced circuit failure mode. Consideration of this may be helpful within the safe shutdown analysis. Consider the following consequences in the safe shutdown circuit analysis when determining the effects of open circuits: Loss of electrical continuity may occur within a conductor resulting in de-energizing the circuit and causing a loss of power to, or control of, the required safe shutdown equipment. In selected cases, a loss of electrical continuity may result in loss of power to an interlocked relay or other device. This loss of power may change the state of the equipment. Evaluate this to determine if equipment fails safe. Open circuit on a high voltage (e.g., 4.16 kV) ammeter current transformer (CT) circuit may result in secondary damage. Figure 3.5.2-1 shows an open circuit on a grounded control circuit. [Refer to hard copy of NEI 00-01 for Figure 3.5.2-1] Open circuit No. 1: An open circuit at location No. 1 will prevent operation of the subject equipment. Open circuit No. 2: An open circuit at location No. 2 will prevent opening/starting of the subject equipment, but will not impact the ability to close/stop the equipment.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

Does not Align	Open circuits are analyzed as shown on the referenced figures from NEI 00-01. However, an assumption is made about the secondary windings of CT's and open circuits based on EPRI data causing a fire as being of sufficiently low probability as to not be a credible event. In addition, CT's are designed to maintain integrity upon a secondary open circuit and they are contained within metal-clad switchgear which should contain any damage should there be an energetic failure. This is an open item to be considered within the scope of the Circuit Coordination Study update. Because of an assumption concerning not postulating an open circuit on a high voltage CT circuit, Oconee does not aligns with the guidance.		EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.4 and 8.4

Open Item ID	**Open Item Description**	**Disposition**	**Open/Closed**	Date Entered
3.5.2.1	The circuit coordination analysis for Oconee needs to be updated. The assumption of circuit coordination in the safe shutdown analysis needs to be validated. Included within the scope of the study is the need for documenting the impact of open circuits on the secondary windings of current transformers.		Open	5/15/2008

Corrective Action Reference PIP O-08-02444

Include in LAR/TR Yes

Change Eval / Modification Reference

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.2 Circuit Failures Due to a Short-to-Ground [General]	This section provides guidance for addressing the effects of a short-to-ground on circuits for safe shutdown equipment. A short-to-ground is a fire-induced breakdown of a cable insulation system resulting in the potential on the conductor being applied to ground potential. A short-to-ground can cause a loss of power to or control of required safe shutdown equipment. In addition, a short-to-ground may affect other equipment in the electrical power distribution system in the cases where proper coordination does not exist. Consider the following consequences in the post-fire safe shutdown analysis when determining the effects of circuit failures related to shorts-to-ground: o A short to ground in a power or a control circuit may result in tripping one or more isolation devices (i.e. breaker/fuse) and causing a loss of power to or control of required safe shutdown equipment. o In the case of certain energized equipment such as HVAC dampers, a loss of control power may result in loss of power to an interlocked relay or other device that may cause one or more spurious operations.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic Paragraph. Alignment discussed in subsequent sections.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.2 Circuit Failures Due to a Short-to-Ground [A, Grounded Circuits]	This section provides guidance for addressing the effects of a short-to-ground on circuits for safe shutdown equipment. A short-to-ground is a fire-induced breakdown of a cable insulation system resulting in the potential on the conductor being applied to ground potential. A short-to-ground can cause a loss of power to or control of required safe shutdown equipment. In addition, a short-to-ground may affect other equipment in the electrical power distribution system in the cases where proper coordination does not exist. Short-to-Ground on Grounded Circuits Typically, in the case of a grounded circuit, a short-to-ground on any part of the circuit would present a concern for tripping the circuit isolation device thereby causing a loss of control power. Figure 3.5.2-2 illustrates how a short-to-ground fault may impact a grounded circuit. [Refer to hard copy of NEI 00-01 Rev. 1 for Figure 3.5.2-2] Short-to-ground No. 1: A short-to-ground at location No. 1 will result in the control power fuse blowing and a loss of power to the control circuit. This will result an inability to operate the equipment using the control switch. Depending on the coordination characteristics between the protective device on this circuit and upstream circuits, the power supply to other circuits could be affected. Short-to-ground No. 2: A short-to-ground at location No. 2 will have no effect on the circuit until the close/stop control switch is closed. Should this occur, the effect would be identical to that for the short-to-ground at location No. 1 described above. Should the open/start control switch be closed prior to closing the close/stop control switch, the equipment will still be able to be opened/started.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Certain cables were excluded if all postulated fire induced faults (open circuit, hot-short or short to ground) have no adverse consequences for the component. Fire Area analysis methodology assumes multiple fire induced failures. The analysis technique for Short-to-Ground for grounded circuits as shown in the referenced NEI 00-01 figures were utilized.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.2 Circuit Failures Due to a Short-to-Ground [B, Ungrounded Circuits]	Short-to-Ground on Ungrounded Circuits In the case of an ungrounded circuit, postulating only a single short-to-ground on any part of the circuit may not result in tripping the circuit isolation device. Another short-to-ground on the circuit or another circuit from the same source would need to exist to cause a loss of control power to the circuit. Figure 3.5.2-3 illustrates how a short to ground fault may impact an ungrounded circuit. [Refer to hard copy of NEI 00-01 Rev. 1 for Figure 3.5.2-3] Short-to-ground No. 1: A short-to-ground at location No. 1 will result in the control power fuse blowing and a loss of power to the control circuit if short-to-ground No. 3 also exists either within the same circuit or on any other circuit fed from the same power source. This will result in an inability to operate the equipment using the control switch. Depending on the coordination characteristics between the protective device on this circuit and upstream circuits, the power supply to other circuits could be affected. Short-to-ground No. 2: A short-to-ground at location No. 2 will have no effect on the circuit until the close/stop control switch is closed. Should this occur, the effect would be identical to that for the short-to-ground at location No. 1 described above. Should the open/start control switch be closed prior to closing the close/stop control switch, the equipment will still be able to be opened/started.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The methodology assumes multiple fire induced failures including hot-shorts, shorts-to ground and open circuits. All postulated cable and component failures were identified utilizing the techniques of the referenced NEI 00-01 figures for ungrounded circuits.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4 and 8.2

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.3 Circuit Failures Due to a Hot Short [General]	This section provides guidance for analyzing the effects of a hot short on circuits for required safe shutdown equipment. A hot short is defined as a fire-induced insulation breakdown between conductors of the same cable, a different cable or some other external source resulting in an undesired impressed voltage on a specific conductor. The potential effect of the undesired impressed voltage would be to cause equipment to operate or fail to operate in an undesired manner. Consider the following specific circuit failures related to hot shorts as part of the post-fire safe shutdown analysis: o A hot short between an energized conductor and a de-energized conductor within the same cable may cause a spurious actuation of equipment. The spuriously actuated device (e.g., relay) may be interlocked with another circuit that causes the spurious actuation of other equipment. This type of hot short is called a conductor-to-conductor hot short or an internal hot short. o A hot short between any external energized source such as an energized conductor from another cable (thermoplastic cables only) and a de-energized conductor may also cause a spurious actuation of equipment. This is called a cable-to-cable hot short or an external hot short. Cable-to-cable hot shorts between thermoset cables are not postulated to occur pending additional research.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic Paragraph. Alignment discussed in subsequent sections.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.3 Circuit Failures Due to a Hot Short [A, Grounded Circuits]	A Hot Short on Grounded Circuits A short-to-ground is another failure mode for a grounded control circuit. A short-to-ground as described above would result in de-energizing the circuit. This would further reduce the likelihood for the circuit to change the state of the equipment either from a control switch or due to a hot short. Nevertheless, a hot short still needs to be considered. Figure 3.5.2-4 shows a typical grounded control circuit that might be used for a motor-operated valve. However, the protective devices and position indication lights that would normally be included in the control circuit for a motor-operated valve have been omitted, since these devices are not required to understand the concepts being explained in this section. In the discussion provided below, it is assumed that a single fire in a given fire area could cause any one of the hot shorts depicted. The following discussion describes how to address the impact of these individual cable faults on the operation of the equipment controlled by this circuit. [Refer to hard copy of NEI 00-01 Rev. 1 for Figure 3.5.2-4] Hot short No. 1: A hot short at this location would energize the close relay and result in the undesired closure of a motor-operated valve. Hot short No. 2: A hot short at this location would energize the open relay and result in the undesired opening of a motor-operated valve.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	Intra-cable conductor to conductor hot shorts are analyzed; external hot shorts are not considered credible at Oconee due to the armored cable configuration. The methodology assumes multiple fire induced failures including hot-shorts if energized conductors are present in the cable. Postulated cable and component failures were identified utilizing the techniques of the referenced NEI 00-01 figures for grounded circuits. Hot shorts need not be postulated if energized conductors are not present in the cable; cable-to-cable hot shorts are not postulated between armored cables. This approach meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.2 Nuclear Safety Capability Circuit Analysis

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.3 Circuit Failures Due to a Hot Short [B, Ungrounded Circuits]	A Hot Short on Ungrounded Circuits In the case of an ungrounded circuit, a single hot short may be sufficient to cause a spurious operation. A single hot short can cause a spurious operation if the hot short comes from a circuit from the positive leg of the same ungrounded source as the affected circuit. In reviewing each of these cases, the common denominator is that in every case, the conductor in the circuit between the control switch and the start/stop coil must be involved. Figure 3.5.2-5 depicted below shows a typical ungrounded control circuit that might be used for a motor-operated valve. However, the protective devices and position indication lights that would normally be included in the control circuit for a motor-operated valve have been omitted, since these devices are not required to understand the concepts being explained in this section. In the discussion provided below, it is assumed that a single fire in a given fire area could cause any one of the hot shorts depicted. The discussion provided below describes how to address the impact of these cable faults on the operation of the equipment controlled by this circuit. [Refer to hard copy of NEI 00-01 Rev. 1 for Figure 3.5.2-5] Hot short No. 1: A hot short at this location from the same control power source would energize the close relay and result in the undesired closure of a motor operated valve. Hot short No. 2: A hot short at this location from the same control power source would energize the open relay and result in the undesired opening of a motor operated valve.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	Intra-cable conductor to conductor hot shorts are analyzed; external hot shorts are not considered credible at Oconee due to the armored cable configuration. The methodology assumes multiple fire induced failures including hot-shorts if energized conductors are present in the cable. Postulated cable and component failures were identified utilizing the techniques of the referenced NEI 00-01 figures for ungrounded circuits. Hot shorts need not be postulated if energized conductors are not present in the cable; cable-to-cable hot shorts are not postulated between armored cables. This approach meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.4

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.3 Nuclear Safety Equipment and Cable Location.

Nuclear Safety Equipment and Cable Location. Physical location of equipment and cables shall be identified.

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.3.4 Identify Routing of Cables	Identify the routing for each cable including all raceway and cable endpoints. Typically, this information is obtained from joining the list of safe shutdown cables with an existing cable and raceway database

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	ARTRAK is a relational database that contains the data from the existing ONS Cable and Raceway Tracking Databases. Cable identification Numbers. Endpoints, Drawing references and cable routing data are contained in ARTRAK and tied to safe shutdown component and fire area location data.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1 and 3.2
				ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.3 Nuclear Safety Equipment and Cable Location.

NEI 00-01 Ref	NEI 00-01 Guidance
3.3.3.5 Identify Location of Raceway and Cables by Fire Area	Identify the fire area location of each raceway and cable endpoint identified in the previous step and join this information with the cable routing data. In addition, identify the location of field-routed cable by fire area. This produces a database containing all of the cables requiring fire area analysis, their locations by fire area, and their raceway.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	A listing of all required cables along with associated endpoints and raceway / junction points was obtained from ARTRAK. A copy of the applicable ONS layout drawings which depict fire zones and areas was transposed/overlaid onto the electrical equipment layout drawings. A Cable Routing Worksheet for each cable was completed using ARTRAK and the route verified to assure it was contiguous and that all necessary fire zones were assigned to the route.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2 and Att. K
				ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.3 Nuclear Safety Equipment and Cable Location.

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.4 Circuit Failures Due to Inadequate Circuit Coordination	The evaluation of associated circuits of a common power source consists of verifying proper coordination between the supply breaker/fuse and the load breakers/fuses for power sources that are required for safe shutdown. The concern is that, for fire damage to a single power cable, lack of coordination between the supply breaker/fuse and the load breakers/fuses can result in the loss of power to a safe shutdown power source that is required to provide power to safe shutdown equipment. For the example shown in Figure 3.5.2-6, the circuit powered from load breaker 4 supplies power to a non-safe shutdown pump. This circuit is damaged by fire in the same fire area as the circuit providing power to from the Train B bus to the Train B pump, which is redundant to the Train A pump. To assure safe shutdown for a fire in this fire area, the damage to the non-safe shutdown pump powered from load breaker 4 of the Train A bus cannot impact the availability of the Train A pump, which is redundant to the Train B pump. To assure that there is no impact to this Train A pump due to the associated circuits' common power source breaker coordination issue, load breaker 4 must be fully coordinated with the feeder breaker to the Train A bus. [Refer to hard copy of NEI 00-01 Rev. 1 for Figure 3.5.2-6] A coordination study should demonstrate the coordination status for each required common power source. For coordination to exist, the time-current curves for the breakers, fuses and/or protective relaying must demonstrate that a fault on the load circuits is isolated before tripping the upstream breaker that supplies the bus. Furthermore, the available short circuit current on the load circuit must be considered to ensure that coordination is demonstrated at the maximum fault level. The methodology for identifying potential associated circuits of a common power source and evaluating circuit coordination cases of associated circuits on a single circuit fault basis is as follows: o Identify the power sources required to supply power to safe shutdown equipment. o For each power source, identify the breaker/fuse ratings, types, trip settings and coordination characteristics for the incoming source breaker supplying the bus and the breakers/fuses feeding the loads supplied by the bus. o For each power source, demonstrate proper circuit coordination using acceptable industry methods. o For power sources not properly coordinated, tabulate by fire area the routing of cables whose breaker/fuse is not properly coordinated with the supply breaker/fuse. Evaluate the potential for disabling power to the bus in each of the fire areas in which the associated circuit cables of concern are routed and the power source is required for safe shutdown. Prepare a list of the following information for each fire area: o Cables of concern. o Affected common power source and its path. o Raceway in which the cable is enclosed. o Sequence of the raceway in the cable route. o Fire zone/area in which the raceway is located. For fire zones/areas in which the power source is disabled, the effects are mitigated by appropriate methods. Develop analyzed safe shutdown circuit dispositions for the associated circuit of concern cables routed in an area of the same path as required by the power source. Evaluate adequate separation based upon the criteria in Appendix R, NRC staff guidance, and plant licensing bases.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.3 Nuclear Safety Equipment and Cable Location.

Does not Align	Proper coordination of common power supplies for all circuits was an assumption of the analysis. Oconee's existing coordination study does not include all SSEL related power supplies. The coordination study needs to be updated with the additional power supplies to ensure that the assumptions of the EIR remain valid.		EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4 and 8.2

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.2.4	The circuit coordination analysis for Oconee needs to be updated. The assumption of circuit coordination in the safe shutdown analysis needs to be validated.		Open	5/5/2008

Corrective Action Reference PIP O-08-02444

Include in LAR/TR Yes

Change Eval / Modification Reference

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.3 Nuclear Safety Equipment and Cable Location.

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.2.5 Circuit Failures Due to Common Enclosure Concerns	The common enclosure associated circuit concern deals with the possibility of causing secondary failures due to fire damage to a circuit either whose isolation device fails to isolate the cable fault or protect the faulted cable from reaching its ignition temperature, or the fire somehow propagates along the cable into adjoining fire areas. The electrical circuit design for most plants provides proper circuit protection in the form of circuit breakers, fuses and other devices that are designed to isolate cable faults before ignition temperature is reached. Adequate electrical circuit protection and cable sizing are included as part of the original plant electrical design maintained as part of the design change process. Proper protection can be verified by review of as-built drawings and change documentation. Review the fire rated barrier and penetration designs that preclude the propagation of fire from one fire area to the next to demonstrate that adequate measures are in place to alleviate fire propagation concerns.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align	The electrical circuit design for Oconee is assumed to provide proper circuit protection in the form of circuit breakers, fuses and other devices that are designed to isolate cable faults before ignition temperature is reached. Adequate electrical circuit protection and cable sizing were included as part of Oconee's plant electrical design. However, the breaker coordination study for Oconee does not include all safe shutdown equipment and the analysis is required to be updated to ensure coordination exists. Should any coordination issues be identified, they will be resolved using the corrective action process. Oconee's fire barrier and penetration designs preclude the propagation of fire from one fire area to the next. Due to the uncertainty of breaker coordination, Oconee does not meet the intent of the guidance.			DC-3.12, Cable Ampacity Design Criteria, Rev. 2, 8/16/2001	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 8.2 and 8.4

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.2.5	Breaker coordination calculations have not been performed for all safe shutdown power supplies and the effects of inadequate breaker coordination on circuits in common enclosures has not been considered.	Evaluate breaker coordination.	Open	5/23/2008

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.3 Nuclear Safety Equipment and Cable Location.

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

Fire Area Assessment. An engineering analysis shall be performed in accordance with the requirements of Section 2.3 for each fire area to determine the effects of fire or fire suppression activities on the ability to achieve the nuclear safety performance criteria of Section 1.5. [See Chapter 4 for methods of achieving these performance criteria (performance-based or deterministic).

NEI 00-01 Ref	NEI 00-01 Guidance
3.4 Fire Area Assessment and Compliance Assessment	By determining the location of each component and cable by fire area and using the cable to equipment relationships described above, the affected safe shutdown equipment in each fire area can be determined. Using the list of affected equipment in each fire area, the impacts to safe shutdown systems, paths and functions can be determined. Based on an assessment of the number and types of these impacts, the required safe shutdown path for each fire area can be determined. The specific impacts to the selected safe shutdown path can be evaluated using the circuit analysis and evaluation criteria contained in Section 3.5 of this document. Having identified all impacts to the required safe shutdown path in a particular fire area, this section provides guidance on the techniques available for individually mitigating the effects of each of the potential impacts.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1 Criteria / Assumptions	The following criteria and assumptions apply when performing fire area compliance assessment to mitigate the consequences of the circuit failures identified in the previous sections for the required safe shutdown path in each fire area.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.1 [Number of Postulated Fires]	Assume only one fire in any single fire area at a time.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Only one fire in a single fire area is assumed to occur.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 8.4

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.2 [Damage to Unprotected Equipment and Cables]	Assume that the fire may affect all unprotected cables and equipment within the fire area. This assumes that neither the fire size nor the fire intensity is known. This is conservative and bounds the exposure fire that is required by the regulation.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	All equipment and cabling within a given fire area are assumed damaged by the fire.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4 and 8.4

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.3 [Assess Impacts to Required Components]	Address all cable and equipment impacts affecting the required safe shutdown path in the fire area. All potential impacts within the fire area must be addressed. The focus of this section is to determine and assess the potential impacts to the required safe shutdown path selected for achieving post-fire safe shutdown and to assure that the required safe shutdown path for a given fire area is properly protected.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The fire area analysis methodology assumes multiple fire induced failures and multiple spurious actuations based on the cables and components present in the fire area of concern. All postulated cable and component failures were identified and only those cables causing non-compliance were analyzed for circuit failure results. The credited safe shutdown success path was analyzed so that mitigating strategies could be developed and documented in the fire area compliance assessment.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4, 8.4 and Att. K

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.4 [Manual Actions]	Use manual actions where appropriate to achieve and maintain post-fire safe shutdown conditions in accordance with NRC requirements.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align	The credited safe shutdown success path was analyzed and mitigating strategies (manual actions, repair actions or modifications) were developed and documented in the fire area compliance assessment. One of the mitigating strategies is manual actions to mitigate the operational effects from fire damage. The NRC has stated the use of hot shutdown manual actions in a deterministic analysis are not allowed. Open items were written to evaluate the use of hot shutdown manual actions. Certain manual actions, such as cold shutdown actions, are already accepted by the NRC as allowed or approved and have been utilized by Oconee as a mitigating strategy. Because the use of hot shutdown manual actions do not meet NRC requirements; Oconee does not align with the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.4 and Attachment L

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.4.1.4	Due to ongoing industry issues related to this topic, an open item is created to track resolution of Operator Manual Actions per FAQ 06-0012 and FAQ 07-0030.		Open	4/7/2008

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.5 [Repairs]	Where appropriate to achieve and maintain cold shutdown within 72 hours, use repairs to equipment required in support of post fire shutdown.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The credited safe shutdown success path was analyzed and mitigating strategies (procedural actions, repair actions or modifications) were developed and documented in the fire area compliance assessment. One of the mitigating strategies for cold shutdown is to perform a repair action to restore required equipment. ONS has procedures in place and has demonstrated the ability to perform the repairs and get to cold shutdown within 72 hours.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4 and Attachment L

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.6 [Assess Compliance with Deterministic Criteria]	Appendix R compliance requires that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage (III.G.1.a). When cables or equipment, including associated circuits, are within the same fire area outside primary containment and separation does not already exist, provide one of the following means of separation for the required safe shutdown path(s): o Separation of cables and equipment and associated nonsafety circuits of redundant trains within the same fire area by a fire barrier having a 3-hour rating (III.G.2.a) o Separation of cables and equipment and associated nonsafety circuits of redundant trains within the same fire area by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area (III.G.2.b). o Enclosure of cable and equipment and associated non-safety circuits of one redundant train within a fire area in a fire barrier having a one-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area (III.G.2.c). For fire areas inside noninerted containments, the following additional options are also available: o Separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards (III.G.2.d); o Installation of fire detectors and an automatic fire suppression system in the fire area (III.G.2.e); or o Separation of cables and equipment and associated non-safety circuits of redundant trains by a noncombustible radiant energy shield (III.G.2.f). Use exemptions, deviations and licensing change processes to satisfy the requirements mentioned above and to demonstrate equivalency depending upon the plant's license requirements.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	The credited safe shutdown success path was analyzed and mitigating strategies (procedural actions, repair actions or modifications) were developed and documented in the fire area compliance assessment. Appendix R section III.G.1 or III.G.2 (or provide 20 feet separation or greater and suppression and detection to comply with Appendix R section III.G.2.b) was used in the Oconee determination in selecting shutdown strategies. Cables in the reactor buildings associated with PZR level on Unit 1 do not meet the requirements of III.G.2. Based on an acceptable justification, an exemption to III.G.2 was granted by the NRC for the reactor buildings. Crediting the exemption, Oconee meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4, 11 and Attachments J and K

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.7 [Consider Additional Equipment]	Consider selecting other equipment that can perform the same safe shutdown function as the impacted equipment. In addressing this situation, each equipment impact, including spurious operations, is to be addressed in accordance with regulatory requirements and the NPP's current licensing basis.

Applicability

Applicable

Comments

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	The analysis initially identified all equipment which could perform a safe shutdown function. The credited safe shutdown success path was chosen from this equipment based on impacted equipment in an area; if necessary mitigating strategies for recovering components were provided. This methodology took into account other equipment that may be available to fulfill safe shutdown functions because all potential safe shutdown equipment and cabling is identified before fire impacts are assessed. Choosing the 'success path' from all analyzed equipment (instead of from a single chosen 'path' of equipment) meets the intent of the guidance.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4 and 11 Att. B, C, & G

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.1.8 [Consider Instrument Tubing Effects]	Consider the effects of the fire on the density of the fluid in instrument tubing and any subsequent effects on instrument readings or signals associated with the protected safe shutdown path in evaluating post-fire safe shutdown capability. This can be done systematically or via procedures such as Emergency Operating Procedures.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	An evaluation of instrument tubing has been performed for Oconee. The evaluation treated the tubing like cabling and associated it with the instrument. The underlying assumption being that the fire impact to an instrument's reading would be adverse and an alternate instrument would be required to fulfill the safe shutdown function.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Section 3.3 and Attachment O

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.2 Methodology for Fire Area Assessment	Refer to Figure 3-5 for a flowchart illustrating the various steps involved in performing a fire area assessment. Use the following methodology to assess the impact to safe shutdown and demonstrate Appendix R compliance: [Refer to hard copy of NEI 00-01 for Figure 3-5]

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Not Required	Generic paragraph. Detailed alignment discussed in subsequent reference paragraphs.				

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.2.1 Identify the Affected Equipment by Fire Area	Identify the safe shutdown cables, equipment and systems located in each fire area that may be potentially damaged by the fire. Provide this information in a report format. The report may be sorted by fire area and by system in order to understand the impact to each safe shutdown path within each fire area (see Attachment 5 for an example of an Affected Equipment Report).

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The ARTRAK database provides a listing of the safe shutdown equipment and cables by fire area.			ARTRAK, Oconee Appendix R Analysis Database Management System, Rev. 1.0, 4/7/2008	
				EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachments B, G & J

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.2.2 Determine the Shutdown Paths Least Impacted By a Fire in Each Fire Area	Based on a review of the systems, equipment and cables within each fire area, determine which shutdown paths are either unaffected or least impacted by a postulated fire within the fire area. Typically, the safe shutdown path with the least number of cables and equipment in the fire area would be selected as the required safe shutdown path. Consider the circuit failure criteria and the possible mitigating strategies, however, in selecting the required safe shutdown path in a particular fire area. Review support systems as a part of this assessment since their availability will be important to the ability to achieve and maintain safe shutdown. For example, impacts to the electric power distribution system for a particular safe shutdown path could present a major impediment to using a particular path for safe shutdown. By identifying this early in the assessment process, an unnecessary amount of time is not spent assessing impacts to the frontline systems that will require this power to support their operation. Based on an assessment as described above, designate the required safe shutdown path(s) for the fire area. Identify all equipment not in the safe shutdown path whose spurious operation or mal-operation could affect the shutdown function. Include these cables in the shutdown function list. For each of the safe shutdown cables (located in the fire area) that are part of the required safe shutdown path in the fire area, perform an evaluation to determine the impact of a fire-induced cable failure on the corresponding safe shutdown equipment and, ultimately, on the required safe shutdown path. When evaluating the safe shutdown mode for a particular piece of equipment, it is important to consider the equipment's position for the specific safe shutdown scenario for the full duration of the shutdown scenario. It is possible for a piece of equipment to be in two different states depending on the shutdown scenario or the stage of shutdown within a particular shutdown scenario. Document information related to the normal and shutdown positions of equipment on the safe shutdown equipment list.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	The credited safe shutdown success path was analyzed and mitigating strategies (procedural actions, repair actions or modifications) were identified and documented in the fire area compliance assessment. Safe shutdown logic diagrams were then highlighted to show the credited safe shutdown paths for a given fire area which credits certain mitigating strategies. The Safe Shutdown Equipment List documents both hot and cold shutdown positions and mitigating strategies for each mode. Potential spurious impact of non-credited equipment was evaluated by their inclusion in the fire area compliance analysis.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4, 8.2, 8.3, 8.4 and 11

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.2.3 Determine Safe Shutdown Equipment Impacts	Using the circuit analysis and evaluation criteria contained in Section 3.5 of this document, determine the equipment that can impact safe shutdown and that can potentially be impacted by a fire in the fire area, and what those possible impacts are.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns with Intent	The Safe Shutdown Equipment List (SSEL) and logics were developed based on potential spurious operations and other plant impacts by their selection from a functional basis. The fire area analysis methodology assumes multiple fire induced failures and multiple spurious actuations, based on the safe shutdown cables and components present in the fire area of concern. All postulated safe shutdown cable and component failures were identified and a resolution provided at the cable or component level. However it is not possible to evaluate all the possible combinations of multiple spurious actions that could occur as a result of the fire and the overall affect of these combinations on safe shutdown. Oconee meets the intent of the guidance as presently understood by the industry.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Attachments J, K, and O

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.4.2.3 - MSO	Due to ongoing industry issues related to this topic, an open item is created to track resolution of Multiple Spurious Operations per FAQ 07-0038.		Open	4/8/2008

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.4.2.3 - OMA	Due to ongoing industry issues related to this topic, an open item is created to track resolution of Operator Manual Actions per FAQ 06-0012 and FAQ 07-0030.		Open	4/8/2008

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.2.4 Develop a Compliance Strategy or Disposition to Mitigate the Effects Due to Fire Damage to Each Required Component or Cable	The available deterministic methods for mitigating the effects of circuit failures are summarized as follows (see Figure 1-2): o Provide a qualified 3-fire rated barrier. o Provide a 1-hour fire rated barrier with automatic suppression and detection. o Provide separation of 20 feet or greater with automatic suppression and detection and demonstrate that there are no intervening combustibles within the 20 foot separation distance. o Reroute or relocate the circuit/equipment, or perform other modifications to resolve vulnerability. o Provide a procedural action in accordance with regulatory requirements. o Perform a cold shutdown repair in accordance with regulatory requirements. o Identify other equipment not affected by the fire capable of performing the same safe shutdown function. o Develop exemptions, deviations, Generic Letter 86-10 evaluation or fire protection design change evaluations with a licensing change process. Additional options are available for non-inerted containments as described in 10 CFR 50 Appendix R section III.G.2.d, e and f.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

Does not Align	The credited safe shutdown success path was analyzed so that mitigating strategies (procedural actions, repair actions or modifications) could be developed and documented in the fire area compliance assessment . These potential impacts were resolved by specifying one of the following: o A procedural action to mitigate the effects of fire damage. o A repair action to restore required equipment o An electrical raceway fire barrier for affected cables o Re-routing cables to comply with Section III.G.1 of Appendix R o Sub-divide fire areas and/or upgrade fire area barriers to comply with section III.G.1 or III.G.2 of Appendix R o 20 feet separation or greater and suppression and detection to comply with section III.G.2.b of Appendix R o Approved Exemption or Deviation. Most of these strategies were invoked during the analysis, however plant modifications were not performed to provide the features specified. Credit for existing features was taken wherever possible and procedural (manual) action specified as a last resort. The manual actions used for hot shutdown are not allowed by current regulations for a deterministic analysis. Thus their use to mitigate the effects of circuit failures does not align with the guidance.

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.4.2.4	The use of manual action for HSB does not meet regulatory requirements for a deterministic analysis.	Resolve issue using NFPA-805.	Open	5/23/2008

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	

Table B-2 Nuclear Safety Capability Assessment

Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.4.2.5 Document the Compliance Strategy or Disposition Determined to Mitigate the Effects Due to Fire Damage to Each Required Component or Cable	Assign compliance strategy statements or codes to components or cables to identify the justification or mitigating actions proposed for achieving safe shutdown. The justification should address the cumulative effect of the actions relied upon by the licensee to mitigate a fire in the area. Provide each piece of safe shutdown equipment, equipment not in the path whose spurious operation or mal-operation could affect safe shutdown, and/or cable for the required safe shutdown path with a specific compliance strategy or disposition. Refer to Attachment 6 for an example of a Fire Area Assessment Report documenting each cable disposition.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Aligns	Compliance assessment dispositions codes and their descriptions (i.e., resolution of component hits) were modeled into the ARTRAK database. Components which were only affected by a power supply loss were dispositioned only if the component was in the credited success path and if the component failed in an undesired position for safe shutdown. The cumulative effect of the actions relied upon to mitigate the effects of a fire in the area have been evaluated.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.4 13 and Attachments L and M

Table B-2 Nuclear Safety Capability Assessment Methodology Review

NFPA 805 Section: 2.4.2.4 Fire Area Assessment.

NEI 00-01 Ref	NEI 00-01 Guidance
3.5.1.5 [C, Likelihood of Undesired Consequences]	Determination of the potential consequence of the damaged associated circuits is based on the examination of specific NPP piping and instrumentation diagrams (P&IDs) and review of components that could prevent operation or cause maloperation such as flow diversions, loss of coolant, or other scenarios that could significantly impair the NPP's ability to achieve and maintain hot shutdown. When considering the potential consequence of such failures, the [analyst] should also consider the time at which the prevented operation or maloperation occurs. Failures that impede hot shutdown within the first hour of the fire tend to be most risk significant in a first-order evaluation. Consideration of cold-shutdown circuits is deferred pending additional research.

Applicability	Comments
Applicable	

Alignment Statement	Alignment Basis	Comments	Unit	Reference Document	Doc. Details
Does not Align	Treatment of multiple spurious actuations has not been previously addressed and is being resolved through transition to NFPA-805 and resolution of FAQ 07-0038.			EIR 51-5044354-002, OCONEE APPENDIX R FIRE SAFE SHUTDOWN ANALYSIS , Rev. 2, 4/7/2008	Sections 3.1, 3.2 , 3.4 and 8.2

Open Item ID	Open Item Description	Disposition	Open/Closed	Date Entered
3.5.1.5	Resolution of MSO's is being addressed on an Industry basis through FAQ 07-0038 and transition to NFPA-805		Open	4/7/2008

Corrective Action Reference	PIP O-08-02444
Include in LAR/TR	Yes
Change Eval / Modification Reference	